A Review of High Conservation Values in Western Australia's South-West Forests

A Report to the Conservation Commission of Western Australia

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Ecoscape was available to any organisation, community or individual who wished to make a relevant submission or comment that assisted in the preparation of the report within the agreed Terms of Reference.

Ecoscape would like to thank the staff of the Sustainable Forest Management Division of the Department of Conservation and Land Management and the Conservation Commission of Western Australia who were involved in this study. Ecoscape would also like to thank members of the various conservation and community groups and members who have also provided information for this assessment. These were:

Alison Cassanet, Friends of the Blackwood Forest
Russell Catomore
Barbara Churchwood
Prof. Patricia Crawford and Dr. Ian Crawford
Chris Davies
Mary and Kim Frith, The Bridgetown Greenbushes Friends of the Forest Group
Glen Kelly, WA Aboriginal Native Title Working Group
Tim McCabe
David McKenzie, The Wilderness Society
Leonie van der Maesen, Research Associate, University of Utrecht and spokesperson for Friends of the Earth
Cassandra Menard
Peter Murphy
Helen Nixon
Dr. Jean-Paul Orsini
Peter Robertson, The Western Australian Forest Alliance (WAFA)
Dr. Beth Schultz, The Conservation Council
John Taylor
Rod Whittle

The consultant team involved in this assessment was:
Ecoscape Australia Pty Ltd
Dr. Louise Cullen (Project Manager),
David Kaesehagen,
Natasha Pauli,
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Frank Batini, Natural Resource Management Consultant
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Summary

A Review of High Conservation Values in Western Australia's South-West Forests

Under the "*Protecting our old-growth forests*" policy, the Government of Western Australia made a commitment to undertake a "rigorous assessment of other high conservation values areas to be included in the reserve system". All old-growth forest and large areas of high conservation value forest have already been included in the reserve system, under the Government's policy commitment to "the full protection of all our remaining old-growth and high conservation value forests". A review of conservation values was to be undertaken to ensure that no areas with high conservation values which can contribute to the comprehensive, adequate and representative (CAR) reserve system have been missed by the Government's policy.

This report represents the assessment of conservation values (as defined by the Terms of Referece, Appendix One) of 106 forest blocks and four general areas in the South-West of Western Australia (see Appendix Two for list of blocks). 34 of these blocks have been reported on previously in an interim report submitted January 2001. The assessment of these 34 blocks is also included in this report, along with the assessment of the remaining 72 blocks and four general areas, so that the conservation values of all 106 blocks and the four general areas can be reviewed together.

The forest blocks were assessed against four broad categories relating to high conservation value forest, as follows:

- Old-growth forest;
- Biodiversity;
- Wilderness; and
- Areas of special significance in terms of a high level of community attachment.

Greater detail on the criteria for high conservation value forest relating to each of these categories is provided in the Terms of Reference for the study in Appendix One of this report.

The assessment of conservation values is intended to focus on the contribution each nominated area could make to a comprehensive, adequate and representative (CAR) reserve system. The results of this assessment are to be considered by the Government, which will then decide whether the areas identified as having conservation value warrant being considered high conservation value and whether further additions to the reserve system should be made, taking into account social and economic impacts and the most appropriate means of protecting forest values.

The forest blocks were assessed primarily using existing data, supplied by the Department of Conservation and Land Management (CLM). Additional information on community attachment and social values was collected where possible given the time limitations of this study.

Biodiversity Criteria

The assessment of biodiversity used the JANIS criteria (see Appendix One), for which the primary unit of evaluation is "forest ecosystem", with a target of 15% of the pre-1750 extent of each ecosystem to be included in the CAR reserve system. This target can be contributed to by both formal and informal reserves[1]. Details of the levels of reservation of forest ecosystems broken into formal and informal reserve categories are provided for each block.

While vegetation complexes (a level of organisation of vegetation below that of forest ecosystems) are not specifically referred to in the JANIS criteria they do provide information in relation to the representativeness criteria which requires, as far as possible, sampling the full range of biological variation with forest ecosystems and the geographic replication and remnants in fragmented landscapes criteria. Details of the levels of reservation of vegetation complexes broken into formal and informal reserve categories are provided for each block. For the other biodiversity criteria which do not have reservation targets set, occurrence of the value is reported for each block.

Community Attachment Criteria ('Other' in the Terms of Reference)

The assessment of community attachment used the value of aesthetic quality as defined for the National Estate assessment carried out as part of the Regional Forest Agreement (RFA) process, as well as information from various publications on the South-West forests, submissions made by community groups and the WA Forest Alliance to the Conservation Commission, CLM and other government agencies, information gained from forums held as part of the development of the new Forest Management Plan, and the number of letters sent to the Minister for the Environment and Heritage in relation to specific blocks. The presence of the Bibbulumun track was also included as evidence of community attachment, although it is protected by informal and formal reserves along its length. The assessment also included examining Indigenous values. The main source of information for this was the Aboriginal Consultation Project report, prepared for the RFA. Nevertheless, the information presented in this report should not be taken as a comprehensive assessment of Indigenous values.

There was also little capacity to verify the information supplied by various community organisations. Therefore, Ecoscape simply presents the views of the community groups that relate to specific blocks and does not comment on the validity or accuracy of those views.

Old growth Criteria

The JANIS operational definition of old growth (Old-growth forest is ecologically mature forest where the effects of disturbance are now negligible) was used in this assessment. Consequently, Ecoscape found all areas of old-growth forest in the blocks assessed were either already formally reserved, proposed for formal reservation as a consequence of the Government's "*Protecting our old-growth forests*" policy or will be protected through the exclusion of timber harvesting operations (i.e. by means other than reservation).

[1] Formal reserves are: Nature Reserves; National Parks; Conservation Parks; and CLM Act Section 5(1)(g) and 5(1)(h) reserves with a conservation purpose. Informal reserves include buffers along streams, rivers and roads, and diverse ecotype zones.

Wilderness Criteria

There were no areas of high quality wilderness found in any of the blocks analysed in this assessment.

Section 3 of the report summarises the values identified against these criteria for each of the 106 blocks and four general areas subject to assessment.

Conclusions

The key conclusions from this report are:

- All forest ecosystems represented in the blocks assessed, with the exception of Darling Scarp and Karri South Coast, meet JANIS criteria for CAR reservation level of 15% through a combination of formal and informal reserves. There is little opportunity for significant increases to reservation of the Darling Scarp ecosystem from the public estate, while most of the Karri South Coast ecosystem occurs outside the RFA area and so the figures do not reflect its true reservation status.

- 102 of the forest blocks (including blocks in the four general areas) contained some to many conservation values. The very small parts (*c*. 10 ha) of Forest Grove, Dwalgan and Swarbrick blocks not reserved have no conservation value because these areas appear to have been cleared and are now planted in exotics or an artifact of the grid system used to store information. Because all of Poorginup block is already reserved there was no area to assess.

- Many of the 102 forest blocks that were identified as having conservation values met at least some component of the biodiversity criteria. Few blocks contained forest ecosystems with <15% reserved, although some did contain forest ecosystems less well reserved. Rather, most blocks contained a number of vegetation complexes less well reserved or other biodiversity values such as flora (e.g. disjunct flora, Declared Rare Flora) and fauna (usually Threatened Fauna) values. This data should be considered in determining the representativeness of current forest ecosystem reservation and in considering the contribution that the forest blocks assessed can make to this factor.

- The increase in the reservation level of forest ecosystems generated by adding the area in any one block containing that ecosystem was very small (usually <1%), i.e. no one block can substantially increase the reservation level of a particular ecosystem.

- Similarly, consideration of the contribution of complexes to representativeness showed the potential increase in reservation level of complexes was also small (mostly <2%), although larger increases are possible (e.g. reserving the 53 ha of the TP complex in Kinkin would increase the reservation of this complex from 2.7% to 8.1%, an increase of 5.4%). Some blocks contain vegetation complexes that currently have no areas formally reserved. For example, all areas of the PM2 complex reserved are in informal

reserves. There are 577 ha of this complex in Yardup, which could contribute 15.4% to the reservation level of the PM2 complex (increasing it from 8.8% to 24.2%).

- Again, the increase in reservation level of areas with other biodiversity values tends to be small, e.g. the increase in areas with high biophysical naturalness is generally <0.1%. However, the increase in the formal protection of Declared Rare Flora was as high as 50% for some species, if one additional population in one block is formally reserved. It should be noted that Declared Rare Flora can be reserved by mechanisms other than reservation and do have buffer zones around them during timber harvesting and other operations. Some blocks are also notable for containing a large amount of other biodiversity values. For example, in Chester there are over 2,000 ha of areas with relictual flora, high flora species richness and flora endemism.

- Information was provided to suggest that 90 of the 102 blocks identified as having conservation value had values that meet the 'Other" criteria in the Terms of Reference (Appendix One, termed Social Values and Community Attachment throughout this report). Of these, Dalgarup and the Greater Kingston blocks (Kingston, Walcott, Mersea, Dudijup, Warrup, Corbal, Dwalgan and Winnejup) clearly had the most significant level of information provided in relation to community attachment. In these blocks, members of the local community have undertaken a number of activities which demonstrates their attachment. However, not all of these blocks would contribute much to the CAR reserve system in terms of their biodiversity values. For the remaining blocks community attachment and social values ranged from inclusion by conservation groups on lists of recommended blocks for reserving (based on their biodiversity values as argued by such groups), local community use, the presence of the Bibbulmun track to containing areas of high aesthetic value. The Bibbulmun track is already protected, with informal buffer reserves within multiple use areas or because it runs through reservations. Adding the area with high aesthetic value in any one block to the reserve system would increase the reservation level of this value by a very small amount (usually <1%).

- The assessment of Aboriginal Heritage values for the forest blocks was severely limited by the time allowed for the study, the lack of information readily available and the focus on identifying specific areas of values. Therefore, the information presented in this report on this value should in no way be taken to represent a thorough investigation of the Aboriginal Heritage values present in the forest blocks. It should be noted that there is statutory protection of these values.

- Summing the total area of each conservation value for all the forest blocks it was present in demonstrates that, for some values, the possible increase in reservation if all areas containing a particular value are reserved could be substantial. For example, if all areas of the Jarrah North West ecosystem in the 32 forest blocks this ecosystem was present in are reserved, the reservation level of this ecosystem would increase by 11.4% (from 19.3% to 30.7%). Similarly, if all areas with a high probability of flora species richness where present were reserved, the reservation level of this value would increase by 16.9% (from 75% to 92%). Other factors relating to reserve design would also need to be considered for example boundary/area ratios.

- The reservation levels of some ecosystems, vegetation complexes, areas with flora values (e.g. disjunct flora) and areas with high aesthetic value could be increased substantially by the inclusion of areas currently held as Crown land or as freehold private property; more so than by reserving areas with these values in forest blocks included in this assessment.

- Conservation on private land, using Stewardship Agreements or mechanisms under the Land for Wildlife scheme, should be encouraged because of the noted presence of areas with conservation value on private land. That the inclusion of these lands to the reserve system may provide an additional income to landholders may provide additional motivation.

- Some of the additions to the reserve system proposed by WAFA in 1998 and since can only be made by altering definitions, criteria and targets contained in the Terms of Reference for this study. For example, WAFA's proposals would require a change to the view taken of informal reserves, the boundary which defines reservation targets (currently the RFA boundary) and the definition of old growth forest. These are decisions for Government.

- Government should consider whether to amend Section 5 of the *CALM Act 1984* to recognise that 'informal' reserves in State forest are managed for conservation and to designate these as a conservation category within State forest. This may help change the perception held by conservation groups that informal reserves have no protection.

Old growth Forests

Using the NFPS and JANIS operational definition of old growth, this assessment found no remaining areas of old growth forest within the study region that were not already reserved.

Wilderness

Using the definition of wilderness used in the CRA (Commonwealth and Western Australian RFA Steering Committee, 1998), there were no areas of wilderness identified in the study region.

Sensitivity to Disturbance

Assessing the sensitivity of forest ecosystems and vegetation complexes was possible only in general terms because of the complexity of this topic and the time constraints on this study. Information on the sensitivity of Declared Rare Flora and Threatened Fauna indicates some species are sensitive to the effects of timber harvesting, prescribed burning and *Phytophthora*. The debate over whether there is sufficient data to assess the impacts of logging and prescribed burning on Threatened Fauna and the likelihood that there are some species within a few flora and fauna groups (e.g. fungi, aquatic invertebrates) as yet undiscovered in the South-West, indicates that caution in interpreting the information presented is required.

Ecoscape would also like to emphasise:

- The Terms of Reference were set by the Conservation Commission, the definitions to be used (for example for old growth), the criteria (for example the JANIS criteria) and

the targets to be met (for example 15% or 100% of the estimated pre-1750 area). However, data on the proportions of reserves contributed from formal and informal sources is provided to allow consideration of relative status of reservation as discussed in Section 1.1 of the report.

- This was a desk-top study. No additional biological data could be collected in the time available for the study.
- CLM's role was to provide data requested and explain data that may have been unclear. CLM did not have any role in the evaluation, assessment and writing of the report.
- Data for areas to be assessed were provided to Ecoscape on a forest block basis.
- If the government decides that forest blocks are to be added to reserves on the basis of "Community attachment", they should do so in a transparent way rather than by altering existing definitions for criteria or target levels. Any change to definitions at this stage of the process will have ramifications elsewhere.
- The Terms of Reference did not require Ecoscape to address the consequences of any potential addition to the reserve system that the Government may decide on. Any implications of a reserve addition on sustainable timber yield, employment or other economic and social factors are beyond the scope of this report.

1.0 Introduction

A Review of High Conservation Values in Western Australia's South-West Forests

Under the "*Protecting our old-growth forests*" policy, the Government of Western Australia made a commitment to undertake a "rigorous assessment of other high conservation values areas to be included in the reserve system". All old-growth forest and large areas of high conservation value forest have already been included in the reserve system, under the Government's policy commitment to "the full protection of all our remaining old-growth and high conservation value forests". A review of conservation values was to be undertaken to ensure that no areas with high conservation values which can contribute to the comprehensive, adequate and representative (CAR) reserve system have been missed by the Government's policy.

This report represents the assessment of the conservation values of 106 forest blocks and four general areas in the South-West of Western Australia (Figure 1; Appendix Two). The four general areas are:

- Remaining Wandoo around Mundaring (i.e. all Wandoo not in blocks in the Mundaring area which were included in this assessment);
- Areas west of Margaret River and east of Sues Rd. The following blocks were considered to fall within this area: Bramley, Chapman, Forest Grove, Molloy, Mowen, Treeton and Witchcliffe. These blocks were assessed individually;
- Little Quinninup Brook system; and
- Links between Shannon National Park and Mt Frankland National Park. The following blocks were considered to form this link: Burnside and Mossop. Both blocks were assessed individually.

34 of these blocks were included on the Indicative Harvest Plans for 2002 (Figure 1). These blocks were assessed and reported on in an interim report in January 2001, but the assessment of the 34 Harvest Plan blocks is also included in this report so that the conservation values of all 106 blocks and the four general areas can be reviewed together. The assessment of conservation values for the remaining 72 forest blocks and four general areas is reported here for the first time (Figure 1). This report also includes a discussion of the sensitivity to disturbance of some conservation values and other issues that have arisen during the assessment process.

The assessment of conservation values only occurred on lands vested in the Conservation Commission and focuses on the part of each block that is not within the existing or proposed reserve system (formal and informal). Areas that are currently proposed for reservation (at the time of this report), were treated as reserved. While the boundaries of the proposed reserves are not yet formalised, the most up-to-date information was used in this assessment and any subsequent boundary changes are likely to only have a small effect on the information presented in this report. Nevertheless, information on the presence of some values (e.g. Declared Rare Flora) in existing and proposed reserves within a block was included, as well as any information on community attachment.

1.1 Reserve Tenure

All lands managed for conservation, as well as State forest and timber reserves are vested in the Conservation Commission and are currently managed by the Department of Conservation and Land Management (CLM) on behalf of the Commission.

New reserves are created by the Department of Land Administration (DOLA) under the Land Administration Act. Section 16 of the *Mining Act 1978* requires that DOLA consult with Local Government Authorities and the Department of Minerals and Petroleum Resources before designating an area reserved. The rights to explore and mine are granted either through the Mining Act, Petroleum Act or by State Agreement Acts and mining rights can not be revoked as a consequence of changes in Government policy. The creation of any new reserves that may constrain mining can only occur with the agreement of the mining company involved. Therefore, some areas may have fewer reserves than expected because of the constraints placed on reserve design by mining leases and State Agreement Acts.

Formal Reserves

Section 5 of the *CALM Act 1984* defines the ten types of tenure (for example National Park, Nature Reserve, State forest) used to classify land that is vested in the Conservation Commission. These classifications constrain the management of these areas by CLM (Section 33 and 33A) and set the objectives for management plans (Section 56).

Formal reserves are those reserves with the following tenures: Nature Reserves; National Parks; Conservation Parks; and *CALM Act 1984* Section 5(1)(g) and 5(1)(h) reserves with a conservation purpose.

Currently there are proposals to add to the formal reserve system, namely:

- Reserves proposed in the Government's "*Protecting our old-growth forests*" policy, not yet gazetted;
- Reserves proposed in the 1998 Regional Forest Agreement not yet gazetted;
- Reserves proposed in the 1994-2003 Forest Management Plan not yet gazetted; and
- Reserves proposed in the 1987 Regional Forest Management Plan not yet gazetted.

The tenure and purpose of State forest, National Parks, Conservation Parks and A class Nature Reserves can be changed only with the approval of both Houses of Parliament (Sections 9 and 17 of the *CALM Act 1984*). Any change to other reserves (e.g. removal from the reserve system) requires only Ministerial approval. (Section 17 of the *CALM Act 1984*).

Informal Reserves

Informal reserves were established under the 1994-2003 Forest Management Plan and are protected areas within State forest (Commonwealth and Western Australian RFA Steering Committee, 1998a). Informal reserves consist of:

- River and stream reserves – vary in width from 60 m to 400 m (total width) depending on stream order;
- Travel route reserves – 400 m wide (total) on Level 1 travel routes (including the Bibbulmun Track, in some CLM managed lands formal reserves protect the Bibbulmun Track) and 200 m wide (total) on Level 2 travel routes; and

- Diverse ecotype zones – reserves around rock outcrops, wetlands, heath, sedge, herb and woodland communities.

Informal reserves are protected from timber harvesting by Ministerial conditions as part of an Environmental Protection Authority approval process for harvesting operations. Because informal reserves were created through a public process involving a management plan assessed by the Environmental Protection Authority they can only be altered through a public Section 46 review under the EP Act. Thus they have both security of tenure (Parliament for State forest) and of purpose (EPAct) and any change to their status will require both a public review process and Ministerial approval. Management activities in these areas are audited by the Conservation Commission.

The WA Forest Alliance and other community members argue that informal reserves have a 'lesser" status and are not truly protected and therefore, informal reserves should not count towards the total area reserved. This argument is based on the personal experiences of members of these groups who claim to have witnessed timber harvesting in informal reserves. As already discussed, these areas are intended to have the same security of tenure and purpose as National Parks, Conservation Parks and A class Nature Reserves. In fact, informal reserves have greater security than Nature Reserves, other than A class, as the boundaries of these reserves can be amended by Ministerial decision, without recourse to Parliament or to a public process. In contrast, changes to informal reserves requires a public process. Similarly, the Minister for the Environment has powers of concurrence with respect to mining within informal reserves in State forest, but only powers of recommendation in relation to mining proposals on Nature Reserves other than A class.

The "informal" title given to these reserves does imply a lesser status and could be changed. A better title may be to designate these areas as "conservation reserves in State forest" or something similar and to give them appropriate recognition as conservation reserves within State forest under Section 5 of the *CALM Act 1984*.

1.2 Assessment Criteria

The forest blocks were assessed against four broad categories relating to high conservation value forest, as follows:

- Old-growth forest;
- Biodiversity;
- Wilderness; and
- Areas of special significance in terms of a high level of community attachment.

Greater detail on the criteria for high conservation value forest relating to each of these categories is provided in the Terms of Reference for the study in Appendix One of this report.

The assessment of conservation values is intended to focus on the contribution each area with identified high conservation value could make to a comprehensive, adequate and representative (CAR) reserve system. The results of this assessment are to be considered by the Government, which will then decide whether the areas identified has having conservation value warrant being considered high conservation value and whether further

additions to the reserve system should be made, taking into account social and economic impacts and the most appropriate means of protecting forest values. To provide the Government with a context for informing these decisions, Ecoscape and the Conservation Commission agreed that this assessment should present information on all the ecosystems and complexes (as major components of the biodiversity criteria) present in each block, with their current reservation level and the contribution that reserving the area of each ecosystem or complex within each block could make to the CAR reserve system.

1.3 CAR Reserve System

The National Forest Policy Statement (NFPS) (Commonwealth of Australia, 1992) was an agreement by Commonwealth**,** State and Territory governments on broad goals for the management of Australia's forests. An important component of the NFPS was to commit to the development of a CAR reserve system, which included protection of old-growth forest and forested wilderness for their very high aesthetic, cultural and nature conservation values. The CAR reserve system, in conjunction with complementary management of adjoining unreserved forest areas, was deemed to be the most effective way of meeting the objectives of biodiversity conservation for forests, which were to:

- Maintain ecological processes and dynamics of forest ecosystems in their landscape context;
- Maintain viable examples of forest ecosystems throughout their natural ranges;
- Maintain viable populations of native forest species throughout their natural ranges; and
- Maintain the genetic diversity of native forest species (Joint ANZECC/MCFFA NFPS Implementation Sub-committee (JANIS), 1997).

The principle of *comprehensiveness* is to ensure that the reserve system samples the full range of forest communities. Forest ecosystems and vegetation types are often used as indicators of biodiversity in order to plan a CAR system. *Adequacy* refers to ensuring a level of reservation adequate to protect the viability and integrity of populations, species and communities. Although difficult to define accurately what level of reservation is adequate, the probability of protecting viability and integrity increases with increasing areas of forest systems reserved and appropriately managed. Another important component of adequacy relates to replication. Replication of reserves provides a level of insurance against the loss of forest values due to random localised disturbances. An adequate reserve system must also ensure that ecological and evolutionary processes can occur at a spatial scale, so that corridors and linkages between reserved areas and surrounding land uses should be considered. *Representativeness* within the reserve system ensures that the diversity within each forest ecosystem is sampled, so that the areas selected for reservation should reflect the biodiversity of each community (JANIS, 1997).

The CAR reserve system comprises both public and private lands reserved specifically for conservation. Legislation or other appropriate methods secure the tenure of the reserved areas. The categories of land reserved under the CAR system on public lands include dedicated (or formal) reserves, some informal reserves, and values protected by prescription (such as habitat for rare flora or other threatened species). In the South-West forest region, informal reserves that contribute to the CAR reserve system are:

- Stream reserves of a width equal to or greater than 150 metres;

- Those informal reserves and adjoining areas of land that were accredited by the Commonwealth Scientific Advisory Group for the Deferred Forest Agreement;
- Diverse ecotype zones of an area equal to or greater than 40 hectares;
- 400 m wide travel route reserves in the area containing the Karri Yellow Tingle ecosystem;
- The Bibbulmun Track travel route reserve (400 m wide).

Other informal reserves not counted as part of the CAR reserve system are:

- Stream reserves of a width less than 150 metres;
- Diverse ecotype zones of an area less than 40 hectares unless adjoining other parts of the CAR reserve system; and
- Travel route reserves other than the 400 m wide travel route reserves in the area containing the Karri Yellow Tingle ecosystem.

For a dedicated reserve (such as National Parks and Nature Reserves) to contribute effectively to the CAR system, it should have security of tenure (requiring an Act of Parliament or Ministerial decision to revoke the reserve) and purpose and appropriate management in place. Informal reserves are used when it is not possible or practicable to include conservation values within dedicated reserves, in which case the areas to be protected are reserved under secure tenure, purpose or management arrangements (JANIS, 1997).

The CAR reserve system should preferentially be based on public lands. It may be necessary to include private land within the CAR system where this land contributes to the comprehensiveness and replication of forest ecosystems, and to protect the needs of rare or threatened species or ecosystems on private land. Options for including private land in the CAR reserve system include purchase of priority areas and using mechanisms to ensure protection of values, such as covenants on titles.

1.4 Comprehensive Regional Assessment

A Comprehensive Regional Assessment (CRA) was undertaken in the South-West forest region of Western Australia. The CRA provided the basis for negotiating the Regional Forest Agreement (RFA) for the region, which defined the commitments made by Commonwealth and State Government to forest conservation, forest use and forest-associated industries, intended to operate for 20 years (Commonwealth and Western Australian RFA Steering Committee, 1998b). The area assessed as part of the CRA is referred to as the Regional Forest Agreement or RFA area.

Much of the data used for the assessment of conservation values in this report was gathered during the CRA process. The CRA provided an assessment of economic, social, natural and heritage values for the RFA area. Of relevance to this report are the assessments of biodiversity, old growth forest, wilderness and National Estate values (including cultural and heritage values) undertaken for the CRA (Commonwealth and Western Australian RFA Steering Committee, 1998, b, c and d). Some of the data used for the CRA has since been updated and was used in the assessment detailed in this report, such as the locations of rare and threatened flora.

1.5 Study Area

The South-West RFA region extends from Gingin in the north-west to Denmark in the south, an area of 4.25 million hectares (Figure 1; Commonwealth and Western Australian RFA Steering Committee, 1998b). The western boundary lies along the base of the Darling scarp, excluding the Swan Coastal Plain, and the eastern boundary forms a line between Northam and Rocky Gully. Public land consists of *c*. 2.5 million ha of the region, of which *c*. 1.1 million ha (44%) are formally reserved and *c*. 225,000 ha (9%) are informally reserved, meaning a total of *c*. 1.3 million ha (53%) of the RFA area is reserved (Conservation Commission of Western Australia, 2002).

A combination of landform, soils and rainfall generally determine vegetation patterns in the South-West region (Commonwealth and Western Australian RFA Steering Committee, 1998b). For example, Jarrah-Marri forests dominate the lateritic soils in the northern part of the region and areas where annual rainfall ranges from 900 mm to 1100 mm in the south. Karri forests are dominant in the extreme south-west of the region where rainfall is >1100 mm per annum. Within the broad range of Karri forest, it tends to occur on younger soils and lower slopes, whereas Jarrah or Jarrah-Marri forest will occur on higher slopes and ridges and less fertile soils. In the north-east of the region, Wandoo forest and woodland occur on clay soils where annual rainfall is below 900 mm (Christensen, 1992).

The South-West has long been recognised as a region of high biological diversity in general, a consequence of the wide range of soil types and interaction between soils, topography and climate in the region. The region also contains Gondwanan relicts and has a high level of endemism. However, the region is not universally high in species richness, one component of biodiveristy. Areas of high plant species richness tend to occur more on dry, infertile soils where non-forest communities, such as heathlands and rocky outcrops, dominate.

1.6 Limitations of this Report

In preparing the report on the assessment of conservation values for the 106 forest blocks and four general areas, the consultant team has endeavoured to undertake the study in a thorough, objective and comprehensive manner. However limitations on the study included:

- A short timeframe to complete the assessment and report – nine working weeks from project inception and six working weeks from receipt of first data to first draft. Several reports which were commissioned for the RFA and therefore were used in this assessment had similarly short timeframes, further compounding this limitation in our study;
- Difficulties in contacting relevant people, particularly to research community attachment and particularly to research Aboriginal Heritage values;
- Difficulties in comprehensively verifying the data used in this assessment; and
- Lack of data on various elements of biodiversity, for example invertebrates and fungi.

Figure 1: Location of blocks to be assessed for high conservation value in the South-West region and existing reserve tenure of the of the region.

(MAP PROVIDED SEPERATELY TO REPORT)

2.0 Method

This study is a desktop review of the conservation values of 106 forest blocks and four general areas in the South-West region (Figure 1; Appendix Two). As such, little new information was collected for this assessment and no field studies were undertaken by Ecoscape; most of the information used was obtained from various Department of Conservation and Land Management (CLM) databases that were complied as part of the RFA process, some of which have subsequently been updated. Additional information, generally relating to the community attachment criteria ('Other' in the Terms of Reference, Appendix One), was obtained from conservation groups, local community members and published sources where ever possible. The short time frame for this study limited the amount of community attachment data that could be collected and the capacity to validate the information provided by various community groups.

The assessment was only on the part of the block recorded in CLM's database as being State forest. The existing and proposed reserves (formal and informal) in each block were excluded from the assessment (see Section 1 for more detail).

2.1 Assessment Criteria

The old-growth, biodiversity and wilderness criteria in the Terms of Reference (Appendix One) are drawn from the criteria for the establishment of a comprehensive, adequate and representative (CAR) system that were agreed upon by the Australian and New Zealand Environment and Conservation Council (ANZECC) and the Ministerial Council on Forestry, Fisheries and Aquaculture (MCFAA) in 1997 (JANIS, 1997).

The community attachment criteria (grouped under 'Other' in the Terms of Reference, Appendix One) have been adapted from the criteria used in the National Estate Identification and Assessment in the South-West Forest Region of Western Australia report (Commonwealth and Western Australian Governments RFA Steering Committee, 1998d), which was prepared as part of the Regional Forest Agreement (RFA). The National Estate assessment used 14 criteria. These have been condensed (because of repetition, or the criteria do not relate to community attachment, or the criteria have already been covered by the JANIS criteria) to the four criteria used in this assessment (Appendix One).

2.2 Information sources

The sources of information for this assessment were:

- CLM's FRIIAS outputs (Forest Reservation: Immediate Impact Analysis System) from their FMIS (Forest Management Information System) database. These outputs provided a substantial amount of data and included data on the amount of the value present in the part of the block not reserved (either existing or proposed formal and informal), as well as the contribution it would make to the comprehensive, adequate and representative (CAR) reserve system. The data in the FRIIAS outputs includes:

  - Old-growth Forest;
  - Forest Ecosystems;
  - Vegetation Complexes (developed and mapped by Mattiske and Havel, 1998);
  - Biophysical naturalness;
  - Logging history by decade of last harvest;
  - Centre of flora disjunctiveness. Disjunct flora are defined in the FRIIAS tables as those with a scattered/non-contiguous geogrpahic distribution, i.e. isolated pockets;
  - Centre of relictual flora. This includes those species considered to be primitive and relic species (e.g. cycads, palms etc);
  - Flora species richness, which is the predicted number of species per km^2;
  - Centre of flora endemism;
  - Centres of fauna endemism (National Estate value);
  - Refugia (National Estate value);
  - Contemporary fauna refuges (National Estate value); and
  - Area of high aesthetic value valued by the community (National Estate value).
- CLM's Threatened Ecological Community Database (searched on 4/01/2002);
- CLM's Threatened Flora Database (searched 1/12/2001);
- CLM's Threatened Fauna Database (searched 17/01/2002);
- CLM's FDIS outputs (Fauna Distribution Information System). This system predicts which threatened and priority fauna species are likely to occur in the block based on the vegetation complexes as mapped for the Regional Forest Agreement. For each prediction a probability of occurrence is also produced;
- Reports produced as part of the Regional Forest Agreement;
- Various maps produced as part of the Regional Forest Agreement (these maps are available in Commonwealth and Western Australian RFA Steering Committee, 1998c; updated versions have been used where appropriate);
- The Western Australian Forest Alliance and associated conservation groups submissions and notes;
- Local community conservation group submissions and notes; and
- Various published sources of information on the South-West forests.

Many of the CLM sources of information are predictions of occurrence and distribution (e.g. forest ecosystem pre-1750 distribution, vegetation complex pre-1750 and current distribution, all the flora and fauna values data e.g. flora disjunctiveness) or are affected by the amount of searching and sampling that has occurred in an area (e.g. Threatened Ecological Community, Declared Rare Flora and Fauna databases). This needs to considered when examining their outputs and the results of this assessment.

Of the above sources of information, only the FDIS outputs have not been used in the assessment. This is for two reasons:

1. There is no threshold level for determining how many Threatened and Priority Fauna predicted to occur in a block indicates conservation value. The model predicted that all blocks have some probability of containing between 14 and 18 Threatened and Priority species. Although this seems high, the author of the model, Per Christensen, points out

(in notes attached to data sheets supplied to Ecoscape) that forest areas in general tend to have a probability of a very high number of threatened species because they are refuges for many species that have declined elsewhere. Per Christensen also stated (in his notes) that similarly high numbers of species diversity would also occur in other areas of State forest and throughout the reserve system.

2. The same species tended to occur in all blocks, again making it difficult to determine if the occurrence of particular species indicated some conservation value.

There may be alternative sources of information for at least some of the values assessed in this study. For example, Hopkins *et al*. (1996) developed a vegetation mapping system, based on Beard's work from the 1950s to 1970s (e.g. Beard, 1981), which incorporates floristic and structural information. Hopkins *et al.*'s system covers all of Western Australia, meaning that there is the potential to develop a consistent approach to determining vegetation patterns across the state and appropriate reservation levels. It would be useful to compare Hopkins' mapping system with that used for the RFA (based on Mattiske and Havel's (1998) vegetation complex mapping) however, with the time constraints on this assessment Ecoscape was unable to do this or utilise this additional information.

2.3 Assessment of Biodiversity Criteria

The JANIS biodiversity criteria uses 'forest ecosystems' as the primary unity of evaluation, with a target set of 15% of the pre-1750 extent of each ecosystem to be included in the CAR reserve system. The pre-1750 distribution of each ecosystem has only been determined within the RFA area and therefore may not reflect the true pre-European distribution of the ecosystem. Nevertheless, as information on the distribution of all ecosystems outside the RFA area is not available, the RFA distribution is the only data which can be used in this assessment.

The 15% JANIS target can be contributed to by both formal and informal reserves[1]. Details of the levels of reservation of forest ecosystems broken into formal and informal reserve categories are provided for each block. In the RFA area, there are two forest ecosystems that have <15% of their pre-1750 extent protected, although an additional five ecosystems only exceed the target by a few percent (Table 1). To provide a more comprehensive basis for informing decisions on the conservation values of the forest blocks, it was agreed between Ecoscape and the Conservation Commission that this assessment would provide information on all the ecosystems present in each block (except the Exotic & Cleared, Private Property and Water ecosystems), with their current formal and informal reservation levels.

[1] Formal reserves are: Nature Reserves; National Parks; Conservation Parks; and CLM Act Section 5(1)(g) and 5(1)(h) reserves with a conservation purpose. Informal reserves include buffers along streams, rivers and roads, and diverse ecotype zones.

Table 1: Reservation level of forest ecosystems in the RFA area. Formal reserves are existing and proposed National Parks, Nature Reserves, Conservation Parks, CLM Act sections 5(1)(g) and 5(1)(h) lands. Informal reserves are around steams and rivers, roads, the Bibbulmun track and areas of diverse ecotypes.

Ecosystem	Total reserved (%)	Formal (%)	Informal (%)
Bullich & Yate[1]	77.5	77.5	<0.1
Darling Scarp	7.8	7.6	0.2
Jarrah Blackwood	31.2	23.9	7.3
Jarrah Leeuwin	15.3	14.7	0.6
Jarrah Mt Lindesay	17.4	17.4	<0.1
Jarrah North East	16.8	13.9	2.9
Jarrah North West	19.3	13.9	5.4
Jarrah Rate's Tingle[1]	74.5	74.5	0
Jarrah Red Tingle[1]	64.9	64.9	0
Jarrah Sandy	26.1	22.9	3.2
Jarrah South	47.2	41.0	6.2
Jarrah Unicup	20.0	20.0	0
Jarrah Woodland	52.1	27.5	24.6
Jarrah Yellow Tingle	75.2	75.2	0
Karri Main Belt	48.2	36.2	12.0
Karri Rate's Tingle[1]	72.0	72.0	0
Karri Red Tingle	72.4	72.4	0
Karri South Coast[2]	2.8	2.8	0
Karri West Coast	30.8	30.7	0.1
Karri Yellow Tingle	75.4	75.4	0
Peppermint & Coastal Heath	72.5	72.3	0.2
Rocky outcrops	44.8	29.1	15.7
Sand Dunes	100	100	0
Shrub, Herb & Sedgelands	59.3	51.8	7.5
Swamps	42.8	40.0	2.8
Wandoo Forest	18.1	15.3	2.8
Wandoo Woodland	23.8	19.0	4.8

[1] Rare ecosystems.

[2] 90% of this ecosystem occurs outside the RFA area and therefore, the figures in the above table are not a true reflection of the total amount of this ecosystem in reserve.

In addition to the 15% target, JANIS has set the reservation target for rare and endangered ecosystems at 100% of their extant area. There are four rare ecosystems in the RFA area: Bullich and Yate; Jarrah Rate's Tingle; Jarrah Red Tingle; and Karri Rate's Tingle. All areas of these ecosystems on land that is vested in the Conservation Commission are reserved. Since none of these ecosystems were present in the forest blocks included in this assessment there is no further discussion of these ecosystems.

The importance of diversity of communities (reflected in the vegetation complexes in the assessment area) is also recognised by the JANIS criteria. Unlike forest ecosystems however, there are no targets for the reservation level of vegetation complexes. In this assessment the complexes present in each block, with their formal and informal reservation levels are presented. These show highly variable levels of reservation ranging from less than 1% to more than 90% reserved.

Similary, the other JANIS biodiversity criteria also do not have reservation targets set. In this assessment, occurrence of the value was taken as meeting an element of the criteria and this information was recorded.

For most of the JANIS biodiversity criteria the data provided by the various CLM sources was in the form of number of hectares present in the non-reserved part of the block. The exceptions were:

1. Information relating to the second part of criterion 2.2 (see Appendix One), areas of special significance as corridors or linkages.
This criterion was assessed using maps provided by CLM which showed the proposed tenure of the South-West region. Blocks that were continguous with two or more existing or proposed reserves, or could connect the reserve system with major features such as lakes, were considered to have the potential to act as corridors.

2. The number of records of each species of Declared Threatened Fauna.
If there was a record of a Threatened Fauna (the term here also includes Priority Fauna) species occurring in the State forest part of the block, this was considered to be meeting an element of the criteria and was recorded.

The fauna records provided by CLM indicated that there were 575 records of Threatened Fauna occurrence in State forests, but only 46 records of occurrence in National Parks, Conservation Parks and Nature Reserves. This suggests a bias in sampling and recording that may reflect the location of research areas and density of workers rather than the true distribution of faunal species across the landscape. Therefore, although fauna records have been included as a conservation value, their interpretation requires care. It has already been recognised that there is a paucity of comprehensive surveys on faunal species in the study region (Commonwealth and Western Australian Governments RFA Steering Committee, 1998b).

The Threatened Fauna data presented also requires care in interpretation because reservation levels reported in this report are based existing (gazetted) reserves (current to 1999) and not all the proposed and existing reserves. Therefore, the reservation levels reported for Threatened Fauna are lower than what will be the reservation level once proposed reserves are gazetted.

Based on the above comments, the use of the Threatened Fauna records presents difficulties in assessing conservation values. The record of a Threatened Fauna occurring in block does not confer value to the whole block, nor does it indicate a permanent presence. Nevertheless, some information on Threatened Fauna presence, as a component of biodiversity, needs to be presented and the fauna records (of the two types of specific fauna information available to this assessment) were considered by Ecoscape to be most suitable. Ecoscape strongly urges that the caveats discussed above are considered when reviewing the information presented for each block.

3. The number of records of occurrence of Declared Rare and Priority Flora.
If there was a record of a Declared Rare or Priority species occurring the State forest part of the block, this was considered to be meeting an element of the criteria and was recorded.

Information on the actual species present was only available for the Declared Rare species. Information on the location of Priority species was inferred from maps provided by CLM, and the identity of the species present could not be determined. In addition, if there was more than one record of a Priority species occurring in a block, whether all records were the same species, or reflected different species also could not be determined.

Declared Rare and Priority Flora that are not on land within the reserve system are protected during timber harvesting and other operations.

2.4 Assessment of Other (Community Attachment) Criteria

In addition to the biodiversity information, CLM's FRIIAS tables provided data on the area within each block that meet the National Estate's sub-criterion E.1, which recognises places exhibiting particular aesthetic qualities 'valued by a community or cultural group' as having heritage significance (Commonwealth and Western Australian Governments RFA Steering Committee, 1998d). If a block contained areas that had aesthetic value, this was tabulated and summarised.

(The FRIIAS tables also contained data relating to three other National Estate Natural Values (Centres of fauna endemism, Refugia and Contemporary fauna refuges; Commonwealth and Western Australian Governments RFA Steering Committee, 1998d). Information about these values has been presented within the biodiversity section of this assessment.)

Other community data obtained for this assessment includes:

- the Register of the National Estate, places of social value (including the Indicative list). Areas that are on the Indicative list have not yet been included on the Register of the National Estate by the Australian Heritage Commission, but the place is at some stage of the assessment process. Once the Heritage Commission proposes a place for inclusion, it moves to the Interim list. The inclusion of a place on the Interim list is then advertised, with three months allowed for public comment. Depending on this process, a decision on whether the place should be included on the Register is made. Much of the information used for this part of the assessment was drawn from the National Estate Identification and Assessment report prepared as part of the RFA process (Commonwealth and Western Australian RFA Steering Committee, 1998d). Because of time constraints, Ecoscape did not determine whether the status of a place listed in this report has since changed;
- Various publications on the South-West forests;
- Submissions made by community groups and the WA Forest Alliance to the Conservation Commission, CLM and other government agencies;
- Information gained from forums held as part of the development of the new Forest Management Plan; and
- The number of letters sent to the Minister for the Environment between February 2001 and October 2001 in relation to specific blocks.

CLM maps were also assessed to determine which blocks the Bibbulmun track passed through. Although the Bibbulmun track is protected by both formal and informal reserves

along its length within CLM managed lands, the track is on the Indicative list of National Estate places of social value (non-Aboriginal) and hence has heritage and cultural value and is worth noting.

Consultation with some community members and groups was undertaken to gather additional information (persons or groups consulted with are listed in the Acknowledgments). This provided some further information about the activities of local community groups and their level of attachment to specific blocks. However, as the time allowed for this assessment was brief, the amount of community attachment related data that could be gathered was extremely limited. Although there appears to be no community attachment to many blocks this may simply be a reflection of the lack of time to identify and contact relevant groups.

Ecoscape warns that information supplied by conservation groups and community members could not be verified in the time available and therefore, such information should be viewed with caution. Ecoscape simply presents the views of community groups that relate to specific blocks and does not comment on the validity or accuracy of those views.

Aboriginal Heritage Values

The assessment also included examining Indigenous values. The main source of information for this was the Aboriginal Consultation Project report, prepared for the RFA (Centre for Social Research, 1997). This report consisted of places of Aboriginal Heritage, a description of their value, whether there was sufficient documentation for the place to be listed on the Register of the National Estate and for most places, geographic co-ordinates. A map was prepared by Ecoscape which mapped each of the places of Aboriginal heritage for which there was such data. This allowed identification of blocks that contained sites of Aboriginal heritage. However, the difficulty in obtaining information on Aboriginal values and precise locations limited this assessment and the information presented in this report should not be taken as a comprehensive assessment.

The overall approach taken in this study of identifying specific areas of conservation value, including Aboriginal Heritage value (which was set by the Terms of References), is at extreme odds with the Aboriginal view of the country or land. To Aboriginal people the country itself is a sacred place which requires custodianship and they see the desire to demarcate areas of specific value as a Western science approach, not an Aboriginal one (Glen Kelly *pers. comm.*). The spiritual connection that Aboriginal people have to the country is also by its very nature not limited to specific forest blocks or areas within those blocks. These issues have not been dealt with well in the past (e.g. the RFA process) and therefore, have not be dealt with well in this assessment (Glen Kelly *pers. comm.*). Full recognition and protection of Aboriginal Heritage values will require a different approach to those hitherto taken, and will particularly require a greater inclusion of Aboriginal people in the development of policy and management practices.

The Western Australian Forest Alliance

The Western Australian Forest Alliance (WAFA) is Western Australia's umbrella organisation for the community-based native forest conservation campaign in Western Australia. Formed in 1990, WAFA now has a membership of around 24 groups, including the Conservation

Council of WA and many conservation groups based in South-West towns. A substantial amount of the community attachment information included in this assessment was provided either directly from WAFA, or from people included on a list of individual community organisations provided by WAFA.

Since its formation the WAFA has made numerous submissions to the Government regarding both specific issues and stating the general principles of conservation and forest management that the WAFA believes in. For example, between 8 May 2001 and 12 December 2001, the Government (particularly the Premier, The Minister for the Environment and Heritage, The Minister for Forestry and the Conservation Commission of WA) received at least 14 submissions from the WAFA outlining its views on, among other things, the development of the new Forest Management Plan, criteria for the two planned assessments of forest conservation values (including this assessment), sawlog allocation levels, ecologically sustainable forest management, blocks included in the 2002 Indicative Harvest Plans and the design of the CAR reserve systems. The long history and considerable and varied activity of the WAFA and its member groups indicates a certain level of community attachment to the forest of the South West in general.

Where appropriate, evidence of WAFA's attachment to or valuing of specific blocks is included as part of the assessment of that block. As previously noted, this information could not be verified and this should be considered when reviewing information presented for each block. WAFA have also made general statements about which forests should be considered high conservation value in submissions to the Conservation Commission, 5 September 2001 and Ecoscape, January 2002. As not all of the values in these statements could be identified at the block level within the time constraints of this study, these general statements are presented here to allow their consideration in the assessment of conservation values of the South West forests.

The WAFA nominated the following categories of forest as having high conservation value:

1. all Jarrah/Jarrah-Marri/Jarrah-Blackbutt forest that has been selectively logged only once prior to 1970 and not since, including once-logged forest said to be infected by dieback;
2. all 'two-tier' Karri/Karri-Marri forest;
3. all Wandoo forest and Wandoo woodland that has not been clearfelled or mined;
4. all Tuart forest;
5. all forest that is unlogged (virgin) but that has previously been discounted as old growth due to the presence of dieback;
6. all forest that scored highly in the wilderness and biophysical naturalness assessments as set out in the Comprehensive Regional Asessment (CRA) report, 1998;
7. all forest in CALM's [now CLM] Mornington and Greenbushes Supply Areas that have been selectively logged once or twice prior to 1970, but not logged since;
8. all forest within 100 m of any stream;
9. all forest within 100 m of any wetland;
10. all forest within a drinking water catchment;
11. all forest accessed on a regular basis by tourism and recreation operators, or identified as having high values for tourism and recreation;
12. all forest accessed on a regular basis by local communities for cultural/recreational puposes, or identified as having high values for the same;

13. all forest identified by the AAD and traditional owners as having indigenous cultural heritage values.
14. all forest containing important habitat or refugia for rare and endangered species or threatened ecological communities;
15. all forest needed to provide linkages and connecting corridors between existing, approved or proposed national parks, nature reserves and conservation parks; and
16. all forest that has been identified as HCV through EPA [Environmental Protection Authority], AHC [Australian Heritage Commission], Forests Department MPA [Management Priority Areas] or National Trust of Australia processes.

2.5 Assessment of Old-growth Criteria

The definition of old growth used in this assessment is that same as that used for the 1992 National Forest Policy Statement and the operational interpretation in the JANIS (1997) report:

The NFPS definition of old-growth is:

Forest that is ecologically mature and has been subject to negligible unnatural disturbance such as logging, roading and clearing. The definition focuses on forest in which the upper stratum or overstorey is in the late mature to over mature growth phases.

The JANIS operational definition of old growth is:

Old-growth forest is ecologically mature forest where the effects of disturbance are now negligible.

To implement the Government's "*Protecting our old-growth forests*" policy, CLM identified all areas of old-growth forest not already reserved (either formally or informally). Although the boundaries of these additional old-growth reserves are still in draft form and are still only proposed, these areas were treated as reserved by Ecoscape during this assessment. Consequently, Ecoscape's assessment found no areas of old-growth forest outside the reserve system, in any of the 106 forest blocks or four general areas. Therefore, this value is not reported on in the individual block assessments.

The WA Forest Alliance disagrees with the Government's definition of old-growth forest. The WAFA believe that virgin forest (i.e. unlogged) which has been infected by dieback and forest which has been logged only once prior to 1970 (including such forest infected by dieback) should also be considered old-growth forest. It was outside Ecoscape's Terms of Reference and brief to review the Government's definition of old-growth forest, but Ecoscape has raised this issue with the Conservation Commission.

2.6 Assessment of Wilderness Criteria

The assessment of wilderness utilised the National Wilderness Inventory (NWI) methodology, developed by the Australian Heritage Commission. This method was adopted nation-wide as the standard approach for assessing wilderness in RFA areas and was used

during the Western Australian RFA process (Commonwealth and Western Australian Governments RFA Steering Committee, 1998d).

The NWI method uses four wilderness quality indicators:

- Remoteness from access;
- Remoteness from settlement;
- Apparent naturalness; and
- Biophysical naturalness (note: this is also assessed as a conservation value in its own right in this report).

Summing these individual indices produces an index of wilderness quality (varies from 0 to 20). Nationally agreed criteria state that areas of high wilderness quality are those who score 12 or greater and are larger than 8000 ha (Commonwealth and Western Australian Governments RFA Steering Committee, 1998d). Using these criteria there are no areas of high quality wilderness in the 106 forest blocks or four general areas.

2.7 Contribution to the CAR Reserve System

For each conservation value, the Terms of Reference asked for the contribution to the CAR reserve system if the area of the value was reserved. For most values this was possible and was calculated in the following ways.

Forest Ecosystems and Vegetation Complexes

For forest ecosystems and vegetation complexes, the potential increase in reservation was calculated as a percentage of the ecosystems' or complexes' pre-1750 extent.

For example:

The pre-1750 extent of complex A was estimated to be 10,000 ha. Currently 1,000 ha are reserved, which is 10% of its pre-1750 extent. Block Z contains 500 ha of Complex A – if reserved this would increase the amount of land reserved to 1,500 ha or 15% of Complex A's pre-1750 extent. Therefore, the increase in reservation, relative to the pre-1750 extent, is 5%.

Other Biodiversity Values

For most of these values (except Declared Rare Flora and Threatened Fauna) the potential increase in reservation was calculated as a percentage of the extant area of the value. For DRF, the information provided was the numbers of populations in the block and on reserved land, and so the increase in reservation is calculated on a population basis. For Threatened Fauna, the information provided was number of records occurring on gazetted reserved lands and the increase in reservation could not be calculated.

Aesthetic Values

The potential increase in reservation was calculated as a percentage of the extant area with high aesthetic value.

Social Values and Community Attachment

Increase in reservation could not be calculated.

2.8 Verification of Data

As part of the assessment of high conservation values, verification of the data produced by CLM was required. A thorough and comprehensive verification was not possible within the time frame allowed. The limited data verification which was possible mainly consisted of meetings with CLM personnel, the aim of which was to understand how different data sets are produced through the intersection of Geographic Information System themes. From these meetings Ecoscape concluded that the data produced in the FRIIAS outputs by CLM was assembled objectively.

The data set has been used previously for a number of purposes and subject to verification in the course of its use as well as being verified in separate reviews:

- During the RFA process there were metadata audits of spatial datasets, accreditation of datasets, and reviews of specific components of the data set;
- Mattiske Consulting was commissioned to review the mapping of old-growth forest undertaken for the RFA following queries by stakeholders as to its accuracy (Mattiske Consulting, 1998). Following field analysis, Mattiske Consulting (1998) concluded that the vast majority of the mapping was accurate, although questions were raised as to whether some areas logged prior to 1940 had less intense logging than previously assumed and therefore, may be considered to be old-growth areas. Mattiske Consulting (1998) provide only a general outline of how they carried out this verification with little detail on field methods.
- The data set was also used during the recent assessment of blocks placed under moratorium from logging, although the report does not discuss whether the data was verified (URS, 2001);
- The data is regularly used for the production of annual reports, answering parliamentary questions, and to give ministerial advice.
- The data forms the basis of the development of the new Forest Management Plan.

It should be noted that while this limited verification does not indicate whether the actual data itself is correct and accurate, most of the datasets used in these assessments have been compiled from a number of sources and refined over many years. Nevertheless, concerns have been raised that some of the data are not accurate. These concerns could not be checked in this assessment, but the Conservation Commission is aware of this issue.

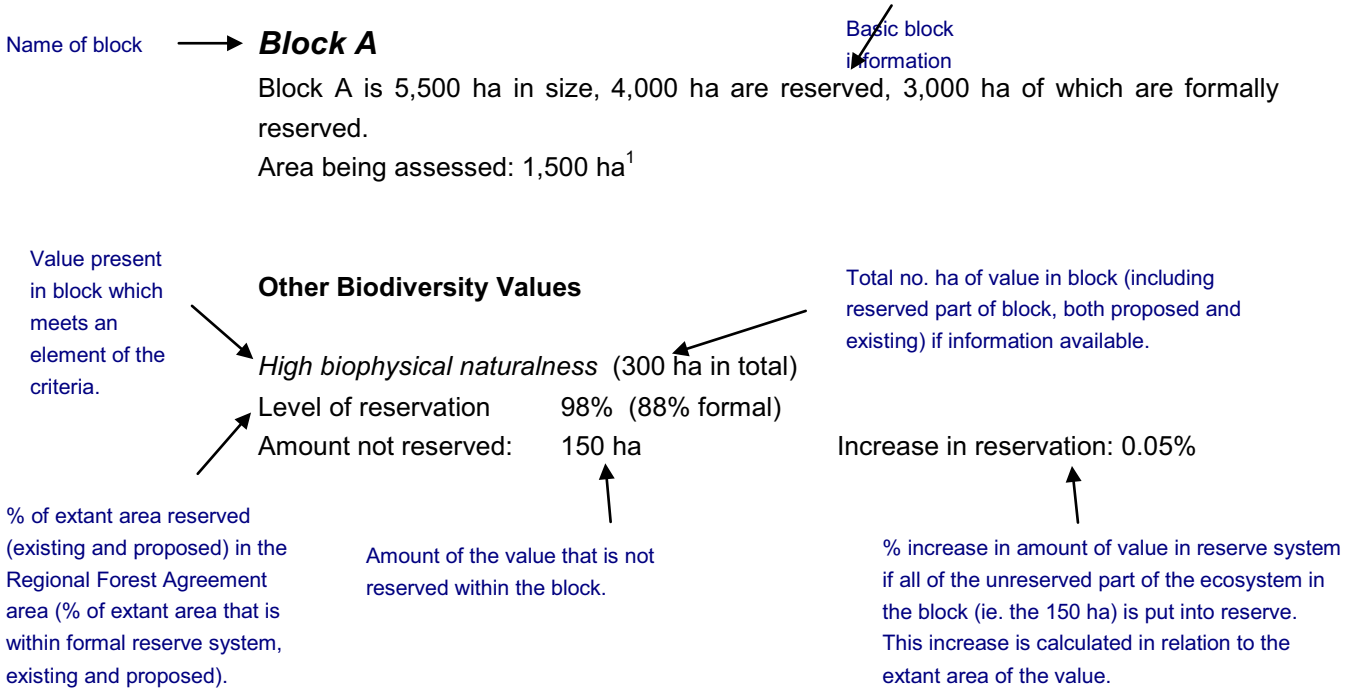
3.0 Summary of Conservation Values by Blocks

The conservation values of each block that met an element of the criteria are presented under the following headings:

Forest Ecosystems (including non-forested natural ecosystems such as swamps, but excluding man made or disturbed areas);
Vegetation Complexes;
Other Biodiversity Values (e.g. biophysical naturalness, flora and fauna values); and
Social Values and Community Attachment

The first three headings relate to the biodiversity criteria in the Terms of Reference, while the Social Value and Community Attachment heading presents any information about the block that meets the fourth criterion in the Terms of Reference ('Other') (Appendix One).

Information on all the ecosystems and complexes present in each block is presented in tabular form. An example is given below to explain the information presented for Other Biodiversity Features and aesthetic values in the Social Values and Community Attachment sub-heading. Other information is presented in an appropriate format. This format was decided upon jointly by Ecoscape and the Conservation Commission.



[1] The sum of the rounded compnent areas do not always equal the rounded block area due to "rounding" adjustments and in some instances the presence of lands such as unallocated crown land, crown reserves not vested in the Conservation Commission, and private land.

3.1 Swan Region Forest Blocks

Amphion *2002 Harvest Plan[1]*

Amphion is 3,220 ha in size, of which 200 ha are informally reserved.
Area being assessed: 3,020 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level[2]
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	3,040	2,894	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	22	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	8	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level[2]
		Total	Formal	Informal			
D1	208,271	14.7	10.0	4.7	2,191	2,179	1.0
My1	68,618	36.0	26.9	9.1	98	67	0.1
Yg1	80,061	29.7	10.3	19.4	782	648	0.8

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)
Amount not reserved: 729 ha Increase in reservation: 0.6%

Threatened Fauna

There is one record of a Woylie (*Bettongia pennicillata ogilbyi*) occurring in Amphion. Woylie have been translocated to Amphion as part of Operation Foxglove. Woylie are a Priority Four species (not protected by legislation) and are considered to be dependent on conservation for their survival by the IUCN. There are 110 records of Woylie occurring within the RFA area, three of which occur on gazetted reserved land.

Social Values and Community Attachment

The Amphion fire exclusion zone has been identified as an Indicative National Estate place of social value (non-Aboriginal) and has value to the local Dwellingup community (The Training and Development Group, 1997).

[1] This indicates those blocks which were included on the 2002 Harvest Plan and were previously assessed in the Interim Report.
[2] If all of the unreserved part of that ecosystem or complex is reserved. This is calculated as a % of the pre-1750 extent.

Biodiversity comments

Amphion, among many other blocks, has been identified by the WA Forest Alliance as having the potential to extend the Lane-Poole Reserve because of its biodiversity values, to improve its viability. The WA Forest Alliance have provided a list of these values, including: old-growth forest (as defined by the WA Forest Alliance[1]), Blackbutt and River Banksia communities, areas of relatively high biophysical naturalness and wilderness quality, and high aesthetic value, although they have not indicated which are specific to Amphion (unverified, see Section 2.4).

Balmoral

Balmoral is 6,510 ha in size of which 880 ha are reserved (10 ha are formally reserved). There are a further 10 ha of old growth forest in the part of Balmoral currently intended to remain State forest available for multiple which is protected through the exclusion of timber harvesting operations.

Area being assessed: 5,610 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	6,162	5,528	0.8
Jarrah Woodland	106,374	52.1	27.5	24.6	76	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	53	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	118	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	162	145	0.4
D1	208,271	14.7	10.0	4.7	1,471	1,426	0.7
D2	86,086	22.4	19.1	3.3	1,436	1,386	1.6
My1	68,618	36.0	26.9	9.1	848	633	0.9
Pn	166,694	33.6	23.9	9.7	39	32	0.02
S	53,656	47.3	29.1	18.2	496	255	0.5
Yg1	80,061	29.7	10.3	19.4	347	289	0.4
Yg2	50,259	31.6	11.0	20.6	1,611	1,362	2.7

[1] The WAFA defines the following as old growth forest: virgin forest (unlogged); forests selectively logged only once prior to 1970; and both these types of forests if infected by dieback.

Other Biodiversity Values

Declared Rare and Priority Flora

There are two records of Priority Flora occurring in Balmoral, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these two records are the same species, or if they reflect the occurrence of two different Priority species in the block.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 1,103 ha Increase in reservation: 0.2%

One letter about Balmoral was sent to the Minister for the Environment and Heritage between February 2001 and October 2001.

The WA Forest Alliance sent a letter (12 December 2001) to the Minister for the Environment and Heritage which stated the WAFA's belief that logging in Balmoral would affect water quality (unverified, see Section 2.4).

Bannister

Bannister is 10,770 ha in size and 1,550 ha are informally reserved. There are a further 10 ha of old growth forest in the part of Balmoral that is currently intended for remain State forest available for multiple use which is protected through the exclusion of timber harvesting operations.

Area being assessed: 9,210 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	7,718	7,065	1.0
Jarrah Woodland	106,374	52.1	27.5	24.6	97	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	31	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	2,204	1,736	0.5
Wandoo Woodland	163,000	23.8	19.0	4.8	611	400	0.3
Rocky Outcrops	26,400	44.8	29.1	15.7	100	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	14	14	0.04
Ck	133,887	15.0	11.1	3.9	1,582	1,345	1.0
D4	132,414	24.0	20.6	3.4	4,327	4,085	3.1
Pn	166,694	33.6	23.9	9.7	3,067	2,384	1.4
S	53,656	47.3	29.1	18.2	1,336	941	1.8
Y5	124,375	26.8	19.6	7.2	435	432	0.3

Other Biodiversity Values

There are no other biodiversity values in Bannister that meet the criteria in Appendix One.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Bannister, along with 14 other blocks (13 of which are included in this assessment) be reserved to form a Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Bombala — *2002 Harvest Plan*

Bombala is 3,460 ha in size, with 320 ha reserved (all informal reserves).

Area being assessed: 3,140 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	770	701	0.1
Jarrah North West	670,600	19.3	13.9	5.4	2,474	2,385	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	78	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	22	21	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	6	4	<0.01
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	78	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	105	105	0.3
D1	208,271	14.7	10.0	4.7	499	489	0.2
D2	86,086	22.4	19.1	3.3	1,571	1,533	1.8
D4	132,414	24.0	20.6	3.4	274	274	0.2
Pn	166,694	33.6	23.9	9.7	521	426	0.3
S	53,656	47.3	29.1	18.2	82	26	0.05
Yg1	80,061	29.7	10.3	19.4	374	259	0.3

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 71 ha Increase in reservation: 0.06%

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Bombala, along with several other blocks, be reserved to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance stated that this group of blocks had the following values: old growth Wandoo forest and woodland and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Boonerring

Boonerring is 8,580 ha in size, with 4,540 ha reserved (3,620 ha formally reserved). There are a further 10 ha of old growth forest in the part of Boonerring that is currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 4,020 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	4,913	1,995	0.3
Jarrah North West	670,600	19.3	13.9	5.4	2,108	1,933	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	330	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	118	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	145	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	421	42	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	519	30	0.02

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	1,025	368	1.0
D1	208,271	14.7	10.0	4.7	178	169	0.08
D2	86,086	22.4	19.1	3.3	967	931	1.1
D4	132,414	24.0	20.6	3.4	2,081	995	0.8
Pn	166,694	33.6	23.9	9.7	2,786	1,149	0.7
S	53,656	47.3	29.1	18.2	1,359	253	0.5
Yg2	50,259	31.6	11.0	20.6	159	138	0.3

Other Biodiversity Values

Declared Rare and Priority Flora

There are three records of Priority Flora occurring in Boonerring, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these three records are all the same species, or if they reflect the occurrence of several Priority species in the block. These three records are from land that is already proposed for reservation.

Threatened Fauna

There is one record of the Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), a Priority Three species (not protected by legislation), occurring in Boonerring. There are 177 records of this species occurring in the RFA area, five of which occur on gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that Boonerring, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Brady

Brady is 7,120 ha in size, of which 800 ha are informally reserved. There are a further 10 ha of old growth forest in the part of Brady currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 6,320 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	6,211	5,840	0.8
Jarrah North West	670,600	19.3	13.9	5.4	5	4	<0.01
Jarrah Sandy	107,900	26.1	22.9	3.2	138	96	0.09
Jarrah Woodland	106,374	52.1	27.5	24.6	63	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	71	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	136	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	359	276	0.08
Wandoo Woodland	163,000	23.8	19.0	4.8	135	95	0.06

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
D4	132,414	24.0	20.6	3.4	3,121	2,984	2.3
G	27,262	56.8	52.6	4.2	65	51	0.2
Pn	166,694	33.6	23.9	9.7	1,144	1,025	0.6
S	53,656	47.3	29.1	18.2	697	465	0.9
Y5	124,375	26.8	19.6	7.2	1,448	1,265	1.0
Yg2	50,259	31.6	11.0	20.6	643	530	1.1

Other Biodiversity Values

Declared Rare and Priority Flora

There are three records of Priority Flora occurring in Brady, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these six records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Threatened Fauna

There are three records of Chuditch (*Dasyurus geoffroii*) occurring in Brady. Chuditch is considered to be rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 370 records of Chuditch occurring in the RFA area, of which 17 occur on gazetted reserved land.

Social Values and Community Attachment

There appear to be no such values in Brady.

Churchlands

Churchlands is 3,220 ha in size, with 700 ha informally reserved. There are a further 70 ha of old growth forest in the part of Churchlands currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,440 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,032	771	0.1
Jarrah Sandy	107,900	26.1	22.9	3.2	52	49	0.05
Jarrah Woodland	106,374	52.1	27.5	24.6	16	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	56	0	0
Shrub, herb & Sedgelands	429,900	59.3	51.8	7.5	68	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	1,283	1,035	0.3
Wandoo Woodland	163,000	23.8	19.0	4.8	652	526	0.3

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	41	41	0.1
G	27,262	56.8	52.6	4.2	121	95	0.4
My2	59,317	27.3	19.7	7.6	779	463	0.8
Pn	166,694	33.6	23.9	9.7	1,655	1,247	0.7
Y5	124,375	26.8	19.6	7.2	403	385	0.3
Y6	158,390	22.1	20.7	1.4	163	150	0.09

Other Biodiversity Values

Declared Rare and Priority Flora

There is one record of a Priority Flora occurring in Churchlands, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c).

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 67 ha Increase in reservation: 0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Churchlands, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining Wandoo forest. The values that WA Forest Alliance identified as

belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 7.4). As the 700 ha reserved in Churchlands are informally reserved, it is unlikely that these areas meet the WA Forest Alliance's recommendation.

Community members suggested that Churchlands should be reserved during the forum held at Mundaring, 5 September 2001, as part of the development of the new Forest Management Plan.

Cooke

Cooke is 6,500 ha in size, of which 4,320 ha are reserved (3,830 ha are formal reserves). Area being assessed: 2,180 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,872	1,085	0.2
Jarrah North West	670,600	19.3	13.9	5.4	3,614	935	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	322	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	108	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	61	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	294	74	0.02
Wandoo Woodland	163,000	23.8	19.0	4.8	151	62	0.04

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	1,291	61	0.2
D2	86,086	22.4	19.1	3.3	1,730	721	0.8
D4	132,414	24.0	20.6	3.4	542	147	0.1
Pn	166,694	33.6	23.9	9.7	1,629	786	0.5
S	53,656	47.3	29.1	18.2	1,227	441	0.8

Other Biodiversity Values

Threatened Fauna

In Cooke there is one record of occurrence of the Peregrine Falcon (*Falco peregrinus*), a specially protected fauna under the *Wildlife Conservation Act 1950*. There are nine records of the Falcon occurring in the RFA area, one of which occurred on gazetted reserved land.

There is one record of Quenda (*Isodon obesulus fusciventer*) occurring in Cooke. Quenda is a Priority Four species (not protected by legislation) and is considered to be dependent on

conservation by the IUCN. There are 162 records of Quenda occurring in the RFA area, of which three occurred on gazetted reserved land.

There is one record of Quokka (*Setonix brachyurus*) occurring in Cooke. Quokka is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950*; the IUCN lists Quokka as being vulnerable. Of the 126 records of Quokka occurrence in the RFA area, four are from gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Cooke, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). A meeting with WAFA indicated that the part of Cooke proposed for reservation is not currently reserved.

Curara — *2002 Harvest Plan*

Curara is 4,690 ha in size, with 410 ha in informal reserves.
Area being assessed: 4,280 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	4,557	4,213	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	46	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	66	66	0.2
D1	208,271	14.7	10.0	4.7	3,128	3,113	1.5
My1	68,618	36.0	26.9	9.1	164	145	0.2
Yg1	80,061	29.7	10.3	19.4	962	650	0.8
Yg2	50,259	31.6	11.0	20.6	283	239	0.5

Other Biodiversity Values

Threatened Fauna

There is one record of a Woylie (a Priority Four species, not protected by legislation) occurring in Curara, which was translocated to the block as part of Operation Foxglove. There are 110 records of Woylie from the RFA area, three of which occur on gazetted reserved land. Woylie are considered to be dependent on conservation by the IUCN.

Social Values and Community Attachment

There appear to be no social values associated with, or community attachment to, Curara.

Dale

Dale is 13,070 ha in size and 8,240 ha are reserved (7,060 ha are in formal reserves). There are a further 10 ha of old growth forest in the part of Dale currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting.

Area being assessed: 4,820 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	8,091	3,895	0.5
Jarrah North West	670,600	19.3	13.9	5.4	1,270	26	<0.01
Jarrah Sandy	107,900	26.1	22.9	3.2	211	134	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	213	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	734	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	294	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	2,041	671	0.2
Wandoo Woodland	163,000	23.8	19.0	4.8	171	72	0.04

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	899	254	0.7
D2	86,086	22.4	19.1	3.3	473	13	0.02
D4	132,414	24.0	20.6	3.4	4,096	1,583	1.2
G	27,262	56.8	52.6	4.2	254	157	0.6
My2	59,317	27.3	19.7	7.6	1,715	10	0.02
Pn	166,694	33.6	23.9	9.7	1,416	577	0.4
S	53,656	47.3	29.1	18.2	1,073	320	0.6
Y5	124,375	26.8	19.6	7.2	882	807	0.6
Yg1	80,061	29.7	10.3	19.4	625	4	<0.01
Yg2	50,259	31.6	11.0	20.6	1,591	1,076	2.1

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation:	56% (51% formal)		
Amount not reserved:	1 ha[1]	Increase in reservation:	<0.01%

Threatened Fauna

There are four records of Numbat (*Myrmecobius fasciatus*) occurring in Dale. The Numbat is considered to be rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 140 records of Numbat occurring in the RFA area, of which three occur on gazetted reserved land.

The Dale MPA (6,300 ha) is on the Interim list of the Register of the National Estate because of its natural values (Commonwealth and Western Australian RFA Steering Committee, 1998d; Australian Heritage Commission Register of the National Estate database, searched March 2002). Nearly the entire previous Dale MPA is reserved.

Social Values and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	48 ha	Increase in reservation:	0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Dale, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the Wa Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Dale that the WAFA want reserved is currently not within the reserve system.

Flint

Flint is 8,230 ha in size and 1,050 ha are informally reserved.
Area being assessed: 7,170 ha

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System (FMIS).

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	5,444	5,053	0.7
Jarrah Sandy	107,900	26.1	22.9	3.2	132	99	0.09
Jarrah Woodland	106,374	52.1	27.5	24.6	226	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	50	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	73	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	1,830	1,635	0.5
Wandoo Woodland	163,000	23.8	19.0	4.8	474	381	0.2

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	137	79	0.2
Ck	133,887	15.0	11.1	3.9	2,147	1,640	1.2
D4	132,414	24.0	20.6	3.4	1,434	1,387	1.0
G	27,262	56.8	52.6	4.2	190	126	0.5
Mi[1]	134,539	6.4	4.6	1.8	172	153	0.1
Pn	166,694	33.6	23.9	9.7	965	842	0.5
S	53,656	47.3	29.1	18.2	131	107	0.2
Y5	124,375	26.8	19.6	7.2	1,961	1,785	1.4
Y6	158,390	22.1	20.7	1.4	1,091	1,051	0.7

Other Biodiversity Values

High biophysical naturalness (128 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 2 ha[2] Increase in reservation: <0.01%

Declared Rare and Priority Flora

There is one population the Declared Rare species, *Caladenia dorrienii* in Flint. Over all of the RFA area there are 11 populations of this species, seven (64%) of which occur on land that is formally reserved. The population in Flint is protected by the exclusion of timber harvesting operations. Formally reserving the population of *C. dorrienii* in Flint would increase the reservation level of the species by 9%.

There is also one population of the Declared Rare species, *Verticordia fimbrilepis* subsp. *fimbrilepis* in Flint. Of the three populations of *V. fimbrilepis* in the RFA area, one occurs on land that is informally reserved. The population in Flint is protected by the exclusion of timber harvesting operations. Formally reserving the population in Flint would increase the reservation level of *V. fimbrilepis* by 33%.

[1] The Mi complex occurs mainly outside the RFA area.

[2] These 2 ha may be an artifact of the grid system used in Forest Management Information System.

There are four records of Priority Flora occurring in Flint, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these four records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Threatened Fauna

There is one record each of Chuditch and Quenda occurring in Flint. Chuditch is considered to be rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. Quenda are a Priority Four species (not protected by legislation) and are considered to be dependent on conservation for their survival by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 occur on gazetted reserved land. There are 162 records of Quenda occurring in the RFA area, three occur on gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Flint, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values.

Flynn

Flynn is 19,040 ha in size, of which 12,950 ha are reserved (9,670 ha are formally reserved). Area being assessed: 6,090 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	4,412	1,418	0.2
Jarrah Sandy	107,900	26.1	22.9	3.2	1,437	13	0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	1,145	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	146	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	481	0	0
Swamps	15,300	42.8	40.0	2.8	12	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	5,981	2,306	0.6
Wandoo Woodland	163,000	23.8	19.0	4.8	5,381	2,318	1.4

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	99	0	0
Ck	133,887	15.0	11.1	3.9	753	499	0.4
G	27,262	56.8	52.6	4.2	3,186	284	1.0
My2	59,317	27.3	19.7	7.6	1,862	1,467	2.5
Pn	166,694	33.6	23.9	9.7	4,880	1,408	0.8
S	53,656	47.3	29.1	18.2	1,015	343	0.6
Y5	124,375	26.8	19.6	7.2	4,951	1,637	1.3
Y6	158,390	22.1	20.7	1.4	2,248	416	0.3

Other Biodiversity Values

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 84 ha Increase in reservation: 0.04%

Declared Rare and Priority Flora

There are numerous records (>10) of Priority Flora occurring in Flynn, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All these records occur on land that is protected in Flynn.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 135 ha Increase in reservation: 0.03%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Flynn, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other blocks, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Flynn that the WAFA want reserved is currently not within the reserves system.

Community members suggested that Flynn should be reserved during the forum held at Mundaring, 5 September 2001, as part of the development of the new Forest Management Plan.

Geddes

Geddes is 11,170 ha in size, with 5,160 ha reserved (of which 4,110 ha are formally reserved). There are a further 10 ha of old growth forest in the part of Geddes currently intended to remain State forest available for multiple use which will be protected be exclusion of timber harvesting operations.
Area being assessed: 6,000 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	9,361	5,598	0.8
Jarrah North West	670,600	19.3	13.9	5.4	105	1	<0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	117	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	219	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	262	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	573	259	0.07
Wandoo Woodland	163,000	23.8	19.0	4.8	527	144	0.09

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	621	401	1.1
Ck	133,887	15.0	11.1	3.9	4	4	<0.01
D2	86,086	22.4	19.1	3.3	18	1	<0.01
D4	132,414	24.0	20.6	3.4	4,383	2,573	1.9
Pn	166,694	33.6	23.9	9.7	4,435	2,592	1.6
S	53,656	47.3	29.1	18.2	1,703	431	0.8

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Geddes.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Geddes, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the Wa Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Hakea

Hakea is 4,850 ha in size of which 780 ha are reserved (310 ha are formally reserved). There are a further 10 ha of old growth forest in the part of Hakea currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting.

Area being assessed: 4,070 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,172	810	0.1
Jarrah North West	670,600	19.3	13.9	5.4	3,321	3,203	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	127	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	8	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	6	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	137	27	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	68	21	0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	136	136	0.4
D1	208,271	14.7	10.0	4.7	512	512	0.2
D2	86,086	22.4	19.1	3.3	1,818	1,808	2.1
D4	132,414	24.0	20.6	3.4	307	215	0.2
My2	59,317	27.3	19.7	7.6	951	526	0.9
Pn	166,694	33.6	23.9	9.7	149	106	0.06
S	53,656	47.3	29.1	18.2	147	102	0.2
Yg1	80,061	29.7	10.3	19.4	271	204	0.3
Yg2	50,259	31.6	11.0	20.6	548	451	0.9

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Hakea.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Hakea, along with several other blocks, be reserved to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance stated that this group of blocks had the following values: old growth Wandoo forest and woodland and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Howse

Howse is 1,860 ha in size, 1,140 ha are reserved (990 ha are formally reserved).
Area being assessed: 720 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	1,851	717	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	10	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	2	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	159	156	0.4
D1	208,271	14.7	10.0	4.7	321	13	0.01
D2	86,086	22.4	19.1	3.3	499	398	0.5
My1	68,618	36.0	26.9	9.1	735	104	0.2
Yg1	80,061	29.7	10.3	19.4	151	46	0.06

Other Biodiversity Values

High biophysical naturalness (66 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed that part of Howse, along with several other blocks, be reserved to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance stated that this group of blocks had the following values: old growth Wandoo forest and woodland and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Howse the WAFA want reserved is not currently within the reserve system.

Keats *2002 Harvest Plan*

Keats is 3,910 ha in size and 2,320 ha are reserved. 2,170 ha are formally reserved.
Area being assessed: 1,590 ha

[1] This 1 ha may be an artifact of the grid system used by Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	3,815	1,576	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	1	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	85	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	409	399	1.1
D1	208,271	14.7	10.0	4.7	1,316	781	0.4
My1	68,618	36.0	26.9	9.1	1,704	125	0.2
Yg1	80,061	29.7	10.3	19.4	464	266	0.3
Yg2	50,259	31.6	11.0	20.6	6	5	<0.1

Other Biodiversity Values

Keats has the potential to act as a corridor link between two parts of the Lane-Poole Reserve.

Social Value and Community Attachment

There appear to be no such values in Keats.

Lang

Lang is 7,620 ha in size, with 970 ha informally reserved.

Area being assessed: 6,650 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	7,299	6,531	1.0
Jarrah Woodland	106,374	52.1	27.5	24.6	38	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	141	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	7	0	0
Swamps	15,300	42.8	40.0	2.8	6	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	1,748	1,475	4.2
D1	208,271	14.7	10.0	4.7	2,816	2,692	1.3
My1	68,618	36.0	26.9	9.1	1,914	1,578	2.3
Yg1	80,061	29.7	10.3	19.4	864	681	0.9
Yg2	50,259	31.6	11.0	20.6	150	106	0.2

Other Biodiversity Values

Threatened Fauna

There is one record of the Red-tailed Black Cockatoo occurring in Lang. The Cockatoo is a Priority Three species (not protected by legislation), and there are 177 records of the species occurring in the RFA area, five of which are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 6,559 ha Increase in reservation: 1.3%

Between February 2001 and October 2001 three letters were sent to the Minister for the Environment and Heritage about the Lang block.

The WA Forest Alliance sent a letter (12 December 2001) to the Minister for the Environment and Heritage which stated the WAFA's belief that logging in Lang would affect water quality.

Leona

Leona is 7,290 ha in size and 940 ha are informally reserved.

Area being assessed: 6,350 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	4,689	4,326	0.6
Jarrah North West	670,600	19.3	13.9	5.4	1,622	1,526	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	77	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	106	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	66	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	517	351	0.1
Wandoo Woodland	163,000	23.8	19.0	4.8	182	119	0.07

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	880	798	2.3
D2	86,086	22.4	19.1	3.3	868	829	1.0
D4	132,414	24.0	20.6	3.4	1,513	1,455	1.1
My1	68,618	36.0	26.9	9.1	186	139	0.2
Pn	166,694	33.6	23.9	9.7	2,642	2,302	1.4
S	53,656	47.3	29.1	18.2	779	498	0.9
Yg2	50,259	31.6	11.0	20.6	392	301	0.6

Other Biodiversity Values

Threatened Fauna

There is one record of Woylie (*Bettongia pennicillata ogilbyi*) occurring in Leona. Woylie have been translocated to Leona as part of Operation Foxglove. Woylie are a Priority Four species (not protected by legislation), and the IUCN considers them to be dependent on conservation. There are 110 records of Woylie occurring in the RFA area, three are from gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Leona, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The reserved part of Leona is unlikely to meet the WA Forest Alliance's proposal because it is informally reserved.

Pindalup — *2002 Harvest Plan*

Pindalup is 4,610 ha with 720 ha informally reserved.

Area being assessed: 3,880 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	33	22	<0.01
Jarrah North West	670,600	19.3	13.9	5.4	4,334	3,841	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	192	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	25	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	129	129	0.4
D1	208,271	14.7	10.0	4.7	2,844	2,715	1.3
Pn	166,694	33.6	23.9	9.7	33	22	0.01
S	53,656	47.3	29.1	18.2	76	35	0.1
Yg1	80,061	29.7	10.3	19.4	1,323	839	1.0
Yg2	50,259	31.6	11.0	20.6	179	122	0.2

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 1,621 ha Increase in reservation: 1.4%

Social Value and Community Attachment

Pindalup appears to have no social values or community groups associated with it.

Qualen

Qualen is 8,130 ha in size, of which 3,440 ha are reserved (2,440 ha are formally reserved).
Area being assessed: 4,690 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	3,759	2,593	0.4
Jarrah Sandy	107,900	26.1	22.9	3.2	158	62	0.06
Jarrah Woodland	106,374	52.1	27.5	24.6	58	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	65	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	147	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	3,018	1,806	0.5
Wandoo Woodland	163,000	23.8	19.0	4.8	912	225	0.1

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	384	281	0.8
D4	132,414	24.0	20.6	3.4	1,858	1,582	1.2
G	27,262	56.8	52.6	4.2	63	62	0.2
Pn	166,694	33.6	23.9	9.7	3,582	1,876	1.1
S	53,656	47.3	29.1	18.2	827	233	0.4
Y6	158,390	22.1	20.7	1.4	1,404	652	0.4

Other Biodiversity Values

Declared Rare and Priority Flora

There are five records of Priority Flora occurring in Qualen, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All the records in Qualen occur on land that is reserved.

Threatened Fauna

There are six records of Numbat occurring in Qualen. Numbats were translocated to Qualen under the Western Shield Programme. The Numbat is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 140 records of Numbat occurring in the RFA area, three occur on gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	74 ha	Increase in reservation:	0.01%

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Qualen, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Qualen that the WAFA want reserved is not currently within the reserve system.

Sullivan

Sulllivan is 11,830 ha in size, 7,670 ha are reserved (7,060 ha are formally reserved). There are a further 70 ha of old growth forest in the part of Sullivan that is currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.

Area being assessed: 4,080 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	3,234	2,245	0.3
Jarrah Sandy	107,900	26.1	22.9	3.2	1,498	79	0.07
Jarrah Woodland	106,374	52.1	27.5	24.6	396	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	106	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	897	0	0
Swamps	15,300	42.8	40.0	2.8	41	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	3,364	1,241	0.3
Wandoo Woodland	163,000	23.8	19.0	4.8	2,275	509	0.3

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	158	0	0
G	27,262	56.8	52.6	4.2	3,131	19	0.07
Pn	166,694	33.6	23.9	9.7	2,768	1,716	1.0
S	53,656	47.3	29.1	18.2	1,760	269	0.5
Y5	124,375	26.8	19.6	7.2	238	212	0.2
Y6	158,390	22.1	20.7	1.4	3,770	1,858	1.2

Other Biodiversity Values

Declared Rare and Priority Flora

There are numerous records (>10) of Priority Flora occurring in Sullivan, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All the records occur on land that is reserved in Sullivan.

Threatened Fauna

There is one record of Woylie occurring in Sullivan. Woylie has been translocated to Sullivan as part of Operation Foxglove. Woylie is a Priority Four species (not protected by legislation), and is considered to be dependent on conservation by the IUCN. There are 110 records from the RFA area, three of which are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 10 ha Increase in reservation: <0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Sullivan, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Talbot

Talbot is 10,390 ha in size, with 9,110 ha reserved (9,000 ha are formally reserved).
Area being assessed: 1,160 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,486	62	0.01
Jarrah Sandy	107,900	26.1	22.9	3.2	101	2	<0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	197	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	46	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	437	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	3,297	851	0.2
Wandoo Woodland	163,000	23.8	19.0	4.8	4,700	241	0.2

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ck	133,887	15.0	11.1	3.9	2	0	0
G	27,262	56.8	52.6	4.2	770	2	0.01
Pn	166,694	33.6	23.9	9.7	5,572	765	0.5
S	53,656	47.3	29.1	18.2	148	1	<0.01
Y5	124,375	26.8	19.6	7.2	70	64	0.05
Y6	158,390	22.1	20.7	1.4	3,743	324	0.2

Other Biodiversity Values

Declared Rare and Priority Flora

There are three records of Priority Flora occurring in Talbot, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All the records occur on land that is reserved in Talbot.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 5 ha[1] Increase in reservation: <0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Talbot, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve all remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Taree

Taree is 4,350 ha in size, with 400 ha informally reserved.

Area being assessed: 3,950 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,330	1,198	0.2
Jarrah North West	670,600	19.3	13.9	5.4	2,628	2,545	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	64	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	18	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	28	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	135	103	0.03
Wandoo Woodland	163,000	23.8	19.0	4.8	126	85	0.05

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	128	128	0.4
D1	208,271	14.7	10.0	4.7	708	705	0.3
D2	86,086	22.4	19.1	3.3	1,108	1,096	1.3
D4	132,414	24.0	20.6	3.4	163	161	0.1
My2	59,317	27.3	19.7	7.6	230	210	0.4
Pn	166,694	33.6	23.9	9.7	964	800	0.5
S	53,656	47.3	29.1	18.2	400	258	0.5
Yg2	50,259	31.6	11.0	20.6	628	572	1.1

[1] These 5 ha may be an artifact of the grid system used by Forest Management Information System.

Other Biodiversity Values

Threatened Fauna

There is one record of Woylie occurring in Taree. Woylie have been translocated to Taree as part of Operation Foxglove. Woylie are a Priority Four species (not protected by legislation) and are considered to be dependent on conservation by the IUCN. There are 110 records of the species occurrence in Taree, three are from gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Taree be reserved, along with many other blocks, to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance identified the following values as belonging to the group of blocks: old growth Wandoo forest and woodland, and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Tumlo

Tumlo is 6,500 ha in size, with 2,030 ha reserved (1,230 ha are formally reserved). There are a further 10 ha of old growth forest in the part of Tumlo that is currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.

Area being assessed: 4,470 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	6,231	4,468	0.7
Jarrah Woodland	106,374	52.1	27.5	24.6	204	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	24	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	32	0	0
Swamps	15,300	42.8	40.0	2.8	4	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	674	637	1.8
D1	208,271	14.7	10.0	4.7	2,824	2,398	1.2
My1	68,618	36.0	26.9	9.1	2,014	812	1.2
S	53,656	47.3	29.1	18.2	23	5	0.01
Yg1	80,061	29.7	10.3	19.4	805	516	0.6
Yg2	50,259	31.6	11.0	20.6	156	100	0.2

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in Tumlo.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 157 ha Increase in reservation: 0.03%

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Tumlo be reserved, along with many other blocks, to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance identified the following values as belonging to the group of blocks: old growth Wandoo forest and woodland, and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Tumlo that the WAFA want reserved is not currently reserved.

Wearne

Wearne is 14,570 ha in size, of which 1,190 ha are informally reserved.

Area being assessed: 13,360 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	7,119	6,756	0.9
Jarrah Woodland	106,374	52.1	27.5	24.6	54	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	89	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	44	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	6,130	5,667	1.6
Wandoo Woodland	163,000	23.8	19.0	4.8	1,123	941	0.6

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	226	159	0.5
Ck	133,887	15.0	11.1	3.9	5,987	5,146	3.8
D4	132,414	24.0	20.6	3.4	773	762	0.6
Y5	124,375	26.8	19.6	7.2	4,149	4,043	3.3
Y6	158,390	22.1	20.7	1.4	3,423	3,254	2.1

Other Biodiversity Values

Declared Rare and Priority Flora

There are 10 records of Priority Flora occurring in Wearne, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Threatened Fauna

There is one record of the Malleefowl (*Leipoa ocellata*) occurring in Wearne. The Malleefowl is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are seven records of Malleefowl occurring in the RFA area (164 records from all of Western Australia) and one of these is from gazetted reserved land.

There are two records of Woylie occurring in Wearne. Woylie have been translocated to the block as part of Operation Foxglove. Woylie is a Priority Four species (not protected by legislation) and the IUCN considers the species to be dependent on conservation. There are 110 records of Woylie occurring in the RFA area, three from gazetted reserved land.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Wearne, along with 14 other blocks (13 of which are included in this assessment), be reserved to form a new Wandoo National Park, which would adjoin and connect several other reserves, improving their viability and help reserve remaining areas of Wandoo forest. The values that WA Forest Alliance identified as belonging to this group of blocks were: old growth Wandoo forest (using the WA Forest Alliance's definition of old growth); endangered flora and fauna; floristic richness; vegetation community diversity, including wetlands; biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Yarragil

Yarragil is 3,480 ha in size, of which 1,600 ha are reserved (1,200 ha are formally reserved). Area being assessed: 1,880 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	3,388	1,860	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	49	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	6	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	5	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	39	39	0.1
D1	208,271	14.7	10.0	4.7	1,445	1,103	0.5
My1	68,618	36.0	26.9	9.1	1,499	367	0.5
Yg1	80,061	29.7	10.3	19.4	464	351	0.4

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in Yarragil.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 44 ha Increase in reservation: 0.01%

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Yarragil be reserved, along with many other blocks, to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance identified the following values as belonging to the group of blocks: old growth Wandoo forest and woodland, and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Yarragil that the WAFA want reserved is not currently reserved.

Young

Young is 3,760 ha in size, with 2,420 ha reserved (2,330 ha are formally reserved).

Area being assessed: 1,340 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	3,673	1,328	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	60	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	2	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	7	0	0
Swamps	15,300	42.8	40.0	2.8	4	0	0

Vegetation Complexes

Complex	Pre-1740 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	175	138	0.4
D1	208,271	14.7	10.0	4.7	1,374	959	0.5
My1	68,618	36.0	26.9	9.1	2,057	136	0.2
Yg1	80,061	29.7	10.3	19.4	126	82	0.1
Yg2	50,259	31.6	11.0	20.6	14	13	0.03

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in Young.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 8 ha[1] Increase in reservation: <0.01%

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Young be reserved, along with many other blocks, to extend the Lane-Poole Conservation Reserve to improve its viability. The WA Forest Alliance identified the following values as belonging to the group of blocks: old growth Wandoo forest and woodland, and Jarrah forest (using the WA Forest Alliance's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4). The part of Young that the WAFA want reserved is not currently reserved.

[1] These 8 ha may be an artifact of the grid system used by the Forest Management Information System.

Remaining Wandoo forest and woodland around Mundaring

(excluding all other blocks included in this assessment)

There are 8,110 ha of Wandoo forest and woodland around Mundaring. 1,600 ha of this are informally reserved. In these areas of Wandoo forest and woodland there are an additional 240 ha of old growth forest that protected by the exclusion of timber harvesting operations.

Area being assessed: 6,260 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Wandoo Forest	363,200	18.1	15.3	2.8	6,238	4,932	1.4
Wandoo Woodland	163,000	23.8	19.0	4.8	1,867	1,330	0.8

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	36	33	0.09
Ck	133,887	15.0	11.1	3.9	62	52	0.04
D2	86,086	22.4	19.1	3.3	11	11	0.01
D4	132,414	24.0	20.6	3.4	800	782	0.6
G	27,262	56.8	52.6	4.2	67	53	0.2
He2	16,341	29.9	29.8	0.1	1	0	0
Mi[1]	134,539	6.4	4.6	1.8	33	26	0.02
My2	59,317	27.3	19.7	7.6	2,637	1,728	2.9
Pn	166,694	33.6	23.9	9.7	3,460	2,709	1.6
S	53,656	47.3	29.1	18.2	66	55	0.1
Wi[1]	23,486	0.2	0.1	0.1	4	1	<0.01
Y5	124,375	26.8	19.6	7.2	766	658	0.5
Y6	158,390	22.1	20.7	1.4	131	130	0.08
Yg1	80,061	29.7	10.3	19.4	24	20	0.02

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 422 ha Increase in reservation: 0.4%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 101 ha Increase in reservation: 0.07%

Areas of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 501 ha Increase in reservation: 0.2%

[1] The Mi and Wi complexes occur mainly outside the RFA area.

Note: reserving the above hectares would require careful delineation of their location and boundaries, as the Wandoo forest and woodland around Mundaring is not consolidated into one distinct area.

Threatened Fauna

There is one record of Chuditch occurring in the Wandoo forests and woodlands around Mundaring. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of which are from gazetted reserved land.

There is one record of Crested Shrike-tit (south-western species; *Falcunculua frontatus leucogaster*) occurring in the Wandoo forests and woodlands around Mundaring. The Crested Shrike-tit is a Priority Four species (not protected by legislation) and there are eight records of its occurrence in the RFA area (18 from all of Western Australia), two are from gazettted reserved land.

There is also one record of Quenda occurring in this area. Quenda are a Priority Four species (not protected by legislation) and the IUCN considers the species to be dependent on conservation. There are 162 records of Quenda occurring in the RFA area, three are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	589 ha	Increase in reservation:	0.1%

Local community members, who live in the hills around Mundaring, stated at the FMP forum held at Mundaring, 5 September 2001, that the remaining areas of Wandoo around Mundaring are of high social and heritage value and should be reserved to protect those values.

3.2 South West Region Forest Blocks

Adelaide

Adelaide is 7,870 ha in size, of which 4,850 ha are reserved (4,190 ha of this are formally reserved). There are a further 110 ha of old growth forest in the part of Adelaide currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.

Area been assessed: 2,910 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	6,805	2,910	0.8
Jarrah Woodland	106,374	52.1	27.5	24.6	12	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	1,025	0	0
Swamps	15,300	42.8	40.0	2.8	30	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	703	405	0.8
BK	21,361	63.6	51.6	12.0	2,954	570	2.7
JL	16,245	32.8	13.7	19.1	991	381	2.3
KI	102,240	33.7	26.4	7.3	1,934	828	0.8
TL	27,904	32.1	24.1	8.0	1,028	727	2.6

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 247 ha Increase in reservation: 0.2%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 232 ha Increase in reservation: 0.2%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 2,912 ha Increase in reservation: 1.4%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 258 ha Increase in reservation: 0.1%

Declared Rare and Priority Flora

There are 10 records of Priority Flora occurring in Adelaide, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. Most of the records occur on land that is reserved in Adelaide (based on a visual comparison of maps).

Threatened Fauna

There is one record of Chuditch occurring in Adelaide. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch from the RFA area, 17 of which are from gazetted reserved land.

There is also one record of the Orange-bellied Frog (*Geocrinia vitellina*) occurring in Adelaide. The Orange-bellied Frog is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. This record from Adelaide is the only known population of the frog and the population is protected by a proposed reserve.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Adelaide, along with many other blocks, be reserved to form a Blackwood National Park (which would incorporate the Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA states that the values belonging to this group of blocks are: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Barrabup

Barrabup is 5,410 ha in size, of which 1,460 ha are reserved. Of this 940 ha are formally reserved.

Area being assessed: 3,790 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Darling Scarp	29,000	7.8	7.6	0.2	25	16	0.06
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,185	3,775	1.1
Jarrah North West	670,600	19.3	13.9	5.4	20	1	<0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	40	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	75	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	704	537	1.1
BK	21,361	63.6	51.6	12.0	1,095	485	2.3
BN	2,135	5.2	1.3	3.9	235	189	8.9
BT	21,477	1.8	0.9	0.9	1	1	<0.01
DP	4,088	50.3	42.8	7.5	230	0	0
DS	29,108	7.8	7.6	0.2	16	16	0.05
GA	1,122	17.6	11.6	6.0	13	11	1.0
JL	16,245	32.8	13.7	19.1	633	477	2.9
KI	102,240	33.7	26.4	7.3	1,900	1,689	1.7
LY	1,429	17.7	4.8	12.9	63	48	3.4
TL	27,904	32.1	24.1	8.0	202	179	0.6
WS2	3,332	35.5	28.7	6.8	167	161	4.8

Other Biodiversity Values

High biophysical naturalness (72 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 16 ha Increase in reservation: <0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 91 ha Increase in reservation: 0.04%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 202 ha Increase in reservation: 0.09%

Declared Rare and Priority Flora

There are five records of Priority Flora occurring in Barrabup, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Threatened Fauna

There are two records of Chuditch occurring in Barrabup. Chuditch are listed as rare or likely to become extinct under the *Wildlife Conservation Act 1950* and as vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of these occurred on gazetted reserved land.

Corridors and Linkages

Barrabup lies between the left and right arms of the Blackwood River and could therefore, provide a link between the informal reserve along the right arm of the River and a reinstated Forest Management Plan (1994) reserve along the left arm.

Other

A visual land management assessment of Barrabup 1 in early 2001 by CLM indicated that the landforms in this compartment were highly dissected, with numerous steep sided valleys and gullies. Areas of high topographic diversity were rated as having high scenic quality.

Social Values and Community Attachment

High aesthetic value

Level of Reservation:	64% (61% formal)		
Amount not reserved:	234 ha	Increase in reservation:	0.05%

Barrabup is very close to Nannup and the forest block is frequently used by the local community for recreation purposes.

The Barrabup Pool Precinct has been identified as an Indicative National Estate place of social value (Commonwealth and Western Australian RFA Steering Committee, 1998d). Although the exact location of the Pool Precinct was not determined during this assessment, its appears to lie within the Barrabup forest block. The area features a town and timber mill established in 1908 and two natural pools which were the source of water for the town and the mill. The old townsite has remnants of foundations, remains of the cricket pitch and tennis court and a concrete storeroom ruin. The pools are now an important community gathering place, with swimming, toilet and barbecue facilities (The Training and Development Group, 1997).

The Blackwood River flows along the southern boundary of Barrabup at two points, one of these is proposed for reservation. In 1982 the priority use along the Blackwood River was recreation (Forests Department, 1982). As part of the RFA, the Blackwood River Valley was identified as an Indicative National Estate place of aesthetic value because of its landscape values and valley forests (Commonwealth and Western Australian RFA Steering Committee, 1998d). The Blackwood River was also identified as an important Aboriginal place, but there was insufficient documentation to identify it as a National Estate place (Commonwealth and Western Australian RFA Steering Committee, 1998d).

Barrabup compartment 1 contains a tree significant to the Aboriginal community, known as the Bibilup tree. The tree's location is known and it is protected from timber harvesting operations. Early in 2001, the Noonygar Land Council expressed concerns that there may be other, unknown Aboriginal sites within the block. An Aboriginal elder (Ken Colbung) assessed Barrabup for additional Aboriginal Sites and logging then occurring in the block was stopped to allow a complete survey (information gained from an article which appeared in the Nannup Post & Rail, June 2001).

In May 2001, WAFA posted information on their web site arguing against the logging that was about to occur in Barrabup. This web site included their concerns over the potential loss of Aboriginal Heritage trees, arguing that although significant trees might not be logged, once the surrounding forest was gone these trees would not survive for long.

During the forum held at Margaret River (3 September 2001) as part of the development of the new Forest Management Plan, increasing the size of buffers around streams in Barrabup was identified as a concern for the local community.

Bednall

Bednall is 5,090 ha in size, with 1,480 ha reserved (300 ha are formally reserved). There are a further 30 ha of old growth forest in the part of Bednall that is currently intended to remain old growth forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 3,560 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	3,983	3,217	0.5
Jarrah North West	670,600	19.3	13.9	5.4	350	100	0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	100	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	140	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	296	177	0.05
Wandoo Woodland	163,000	23.8	19.0	4.8	206	60	0.04

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
D2	86,086	22.4	19.1	3.3	110	0	0
D4	132,414	24.0	20.6	3.4	2,953	2,489	1.9
My2	59,317	27.3	19.7	7.6	248	108	0.2
Pn	166,694	33.6	23.9	9.7	1,216	732	0.4
S	53,656	47.3	29.1	18.2	215	36	0.07
Yg1	80,061	29.7	10.3	19.4	130	82	0.1
Yg2	50,259	31.6	11.0	20.6	203	109	0.2

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in Bednall.

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Bednall be reserved (along with many other blocks) to extend the Lane-Poole Reserve to improve its viability. The values the WAFA attributed to this group of blocks are: old growth Wandoo Forest and Woodland and Jarrah forest (based on the WAFA's definition of old growth); Blackbutt and River Banksias communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

Bell

Bell is 5,310 ha in size, of which 2,370 ha are reserved (1,930 ha are formally reserved). There are a further 600 ha of old growth forest in the part of Bell currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 2,340 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	4,544	2,281	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	217	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	24	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	385	35	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	113	5	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ce	35,311	33.3	25.4	7.9	241	188	0.5
Ck	133,887	15.0	11.1	3.9	874	232	0.2
D4	132,414	24.0	20.6	3.4	3,179	1,774	1.3
Mi[1]	134,539	6.4	4.6	1.8	42	0	0
My2	59,317	27.3	19.7	7.6	680	47	0.08
Pn	166,694	33.6	23.9	9.7	157	62	0.04
Yg1	80,061	29.7	10.3	19.4	109	19	0.02

Other Biodiversity Values

High biophysical naturalness (2,628 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 1 ha[2] Increase in reservation: <0.01%

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Bell be reserved (along with many other blocks) to extend the Lane-Poole Reserve to improve its viability. The values the WAFA attributed to this group of blocks are: old growth Wandoo Forest and Woodland and Jarrah forest (based on the WAFA's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

[1] The Mi complex occurs mainly outside the RFA area.

[2] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Bidella

Bidella is 2,060 ha in size, with 740 ha informally reserved. There are a further 680 ha of old growth forest in the part of Bidella that is currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.
Area being assessed: 640 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	1,795	578	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	24	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	167	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ba	1,469	54.8	1.8	53.0	179	1	0.07
BD	47,785	46.8	28.4	18.4	637	237	0.5
CE	24,295	46.2	25.7	20.5	173	49	0.2
GA	1,122	17.6	11.6	6.0	8	0	0
KI	102,240	33.7	26.4	7.3	1,001	302	0.3

Other Biodiversity Values

High biophysical naturalness (1,081 ha in total)

Level of reservation: 98% (88% formal)
Amount not reserved: 11 ha Increase in reservation: <0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)
Amount not reserved: 184 ha Increase in reservation: 0.09%

Refugia

Level of reservation: 97% (92% formal)
Amount not reserved: 5 ha[1] Increase in reservation: 0.01%

Declared Rare and Priority Flora

There are two records of Priority Flora occurring in Bidella, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are the same species, or if they reflect the occurrence of two different Priority species in the block.

Corridors and Linkages

Bidella, along with Storry, Cleave and Central could provide a corridor between reserves to the west and east proposed as a consequence of the Government's "*Protecting our old growth forests*" policy. The informal reserves in these blocks accomplish this already to a large degree.

Social Values and Community Attachment

A submission from a resident of Busselton to Ecoscape indicated that people from Nannup and the surrounding Shires regularly visit a series of long, deep pools in Bidella forest to camp, catch marron, swim, fish and walk. One family has reputedly been going to the pools for three generations. The submission emphasised the importance of the forest in Bidella for recreation and suggested that Aboriginal people would have used the area (although there was no evidence provided to support this statement).

Biodiversity comments

In 1998 the WA Forest Alliance recommended that part of Bidella be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values as belonging to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4). Given that the area reserved in Bidella is informally reserved, it is unlikely that these areas meet the recommendations of the WAFA.

Blackwood

Blackwood is 5,360 ha in size, 1,980 ha are reserved (1,280 ha of this are formally reserved).

Area being assessed: 3,370 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,115	3,363	1.0
Jarrah Woodland	106,374	52.1	27.5	24.6	118	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	119	0	0

[1] These 5 ha may be an artifact of the grid system used by the Forest Management Information System.

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	1,179	612	1.3
BK	21,361	63.6	51.6	12.0	761	427	2.0
CE	24,295	46.2	25.7	20.5	399	351	1.4
DP	4,088	50.3	42.8	7.5	294	4	0.1
JL	16,245	32.8	13.7	19.1	128	36	0.2
KI	102,240	33.7	26.4	7.3	2,321	1,785	1.7
LY	1,429	17.7	4.8	12.9	95	82	5.7
MP	3,966	29.5	25.7	3.8	86	66	1.7
N	17,800	37.8	30.5	7.3	90	0	0

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 3,354 ha Increase in reservation: 1.6%

Threatened Fauna

There is one record of Chuditch occurring in Blackwood. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch from the RFA area, 17 of which are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 237 ha Increase in reservation: 0.05%

The Australian Conservation Foundation, acting as an umbrella for several conservation groups, proposed in 1987 that the status of the Forest Park/Reserve in Blackwood be changed to State Park.

The Blackwood River runs along the northern boundary of Blackwood block. In 1982 the priority use along the Blackwood River was recreation (Forests Department, 1982). As part of the RFA, the Blackwood River Valley was identified as an Indicative National Estate place of aesthetic value because of its landscape values and valley forests (Commonwealth and Western Australian RFA Steering Committee, 1998d). The Blackwood River was also identified as an important Aboriginal place, but there was insufficient documentation to identify it as a National Estate place (Commonwealth and Western Australian RFA Steering Committee, 1998d). Informal and formal reserves occur on both sides of the Blackwood River in the Blackwood block.

In 1998 the WA Forest Alliance recommended that all of Blackwood be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values as belonging to the group of blocks: old growth Jarrah-

Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Bramley

Bramley is 4,050 ha in size, 3,820 ha are reserved (3,710 ha are formally reserved). Bramley is part of the group of blocks which lie between the "east of Margaret River, and west of Sues Rd" which were included in this assessment of conservation values.
Area being assessed: 200 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Leeuwin	56,400	15.3	14.7	0.6	3,554	73	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	29	0	0
Karri West Coast	14,500	30.8	30.7	0.1	164	61	0.4
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	188	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
C1	18,982	13.5	12.3	1.2	1,602	45	0.2
C2	12,879	6.6	6.6	0	73	0	0
Cr	917	26.7	26.7	0	72	0	0
Cw1	6,144	10.1	9.8	0.3	321	8	0.1
Cw2	6,364	4.1	4.1	0	19	0	0
W1	7,296	27.9	25.3	2.6	1,417	70	1.0
Wr	448	19.2	19.2	0	59	0	0
Ww1	2,268	23.3	19.6	3.7	390	34	1.5

Other Biodiversity Values

High biophysical naturalness (194 ha in total)

Level of reservation: 98% (88% formal)
Amount not reserved: 23 ha Increase in reservation: <0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)
Amount not reserved: 114 ha Increase in reservation: 0.05%

Threatened Fauna

There is one record of Chuditch occurring in Bramley. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered

vulnerable by the IUCN. There are 379 records of Chuditch from the RFA area, 17 of which are on gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 160 ha Increase in reservation: 0.03%

Bramley has been identified as an Indicative National Estate place of social value (Commonwealth and Western Australian RFA Steering Committee, 1998d). Bramley is highly significant for the Margaret River community, which uses the forest block for recreation purposes (The Training and Development Group, 1997). Locals value the visual qualities along the river's edge and old railway tracks through the forest. The forest is reported to be spiritually uplifting for the local community. Because of the closeness of Bramley to Margaret River the block is important in creating a sense of place for the town (The Training and Development Group, 1997).

Reserving all areas east of Margaret River and west of Sues Road was raised by local community members at the FMP forum held at Margaret River, 3 September, 2001.

Butler

Butler is 6,990 ha in size, of which 5,180 ha are reserved (4,870 ha are formally reserved). There are a further 30 ha of old growth forest in the part of Butler currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.

Area being assessed: 1,790 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	6,197	1,787	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	321	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	455	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	1,896	425	0.9
BK	21,361	63.6	51.6	12.0	396	87	0.4
CE	24,295	46.2	25.7	20.5	122	91	0.4
CT	3,128	56.9	32.7	24.2	156	0	0
DP	4,088	50.3	42.8	7.5	113	15	0.4
JL	16,245	32.8	13.7	19.1	269	14	0.09
KI	102,240	33.7	26.4	7.3	2,939	905	0.9
MP	3,966	29.5	25.7	3.8	70	0	0
SS	894	57.9	53.4	4.5	163	37	4.1
TL	27,904	32.1	24.1	8.0	849	213	0.8

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 425 ha Increase in reservation: 0.2%

Declared Rare and Priority Flora

There are seven records of Priority Flora occurring in Butler, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All the records occur on land that is reserved in Butler. All records in Butler occur on land that is protected (based on a visual comparison of maps).

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance recommended that the part of Butler containing old growth forest be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). All old growth forest, using the JANIS operational definition, in Butler is now proposed for formal reservation under the Government's "*Protecting our old growth forests*" policy, with the additional 30 ha of old growth forest in the State forest informally reserved. There may be areas of old growth forest as defined by the WAFA that are not reserved.

Canebreak

Canebreak is 6,220 ha in size, with 2,530 ha reserved (1,880 ha of this are formally reserved). There are a further 60 ha of old growth forest in the part of Canebeak currently intended to remain State forest available for multiple use which will be protected by the exclsuion of timber harvesting operations.

Area being assessed: 3,630 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,695	3,608	1.0
Jarrah Woodland	106,374	52.1	27.5	24.6	146	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	298	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	867	434	0.9
CE	24,295	46.2	25.7	20.5	1,256	593	2.4
JL	16,245	32.8	13.7	19.1	19	15	0.09
KI	102,240	33.7	26.4	7.3	1,702	1,122	1.1
MP	3,966	29.5	25.7	3.8	1,488	1,422	35.9
N	17,800	37.8	30.5	7.3	553	0	0
Nw	8,584	45.3	29.5	15.8	214	22	0.3
Sd	37,717	32.8	26.3	6.5	7	0	0
TL	27,904	32.1	24.1	8.0	33	0	0

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 1,354 ha Increase in reservation: 0.6%

Declared Rare and Priority Flora

There is one record of a Priority Flora occurring in Canebreak, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). This Priority species in Caneberak occurs on land that is protected (based on a visual comparison of maps).

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Canebreak be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values as belonging to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Catterick *2002 Harvest Plan*

Catterick is 6,560 ha in size with 670 ha informally reserved.
Area being assessed: 5,890 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	6,076	5,465	0.8
Jarrah Sandy	107,900	26.1	22.9	3.2	441	420	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	30	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	6	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	4	3	<0.01
BO	3,578	23.3	0	23.3	681	555	15.5
CC1	27,443	19.6	10.5	9.1	2,110	1,668	6.1
D1	208,271	14.7	10.0	4.7	3,034	3,006	1.4
G	27,262	56.8	52.6	4.2	442	420	1.5
GR	22,047	15.6	8.7	6.9	198	154	0.7
HR	32,250	24.6	22.2	2.4	82	80	0.2

Other Biodiversity Values

There are no other biodiversity values in Catterick that meet the criteria in Appendix One.

Social Values and Community Attachment

There appears to be no such values in Catterick.

Central

Central is 1,160 ha in size, with 330 ha informally reserved. There are a further 350 ha of old growth forest in the part of Central currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.
Area being assessed: 470 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	820	445	0.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	308	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
JN	4,692	59.5	43.3	16.2	733	372	7.9
Sd	37,717	32.8	26.3	6.5	287	61	0.2
Swd	10,382	57.3	52.2	5.1	109	12	0.1

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 295 ha Increase in reservation: 0.3%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 469 ha Increase in reservation: 0.3%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 469 ha Increase in reservation: 0.2%

Corridors and Linkages

Central, along with Storry, Cleave and Bidella could act as a corridor between reserves proposed to the west and east as a conseqeunce of the Government's "*Protecting our old growth forests*" policy. Informal reserves in these blocks accomplish this already to a large degree.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Central be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Chalk

Chalk is 10,230 ha in size and has 6,170 ha reserved (4,810 ha are formally reserved).
Area being assessed: 4,060 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,744	267	0.04
Jarrah North West	670,600	19.3	13.9	5.4	7,301	3,664	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	695	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	24	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	76	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	212	55	0.02
Wandoo Woodland	163,000	23.8	19.0	4.8	85	6	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ck	133,887	15.0	11.1	3.9	101	0	0
D1	208,271	14.7	10.0	4.7	5,606	2,868	1.4
D2	86,086	22.4	19.1	3.3	159	138	0.2
D4	132,414	24.0	20.6	3.4	1,262	256	0.2
My1	68,618	36.0	26.9	9.1	413	34	0.05
My2	59,317	27.3	19.7	7.6	452	3	0.01
S	53,656	47.3	29.1	18.2	219	0	0
Yg1	80,061	29.7	10.3	19.4	1,181	499	0.6
Yg2	50,259	31.6	11.0	20.6	740	194	0.4

Other Biodiversity Values

Threatened Fauna

There is one record of Woylie occurring in Chalk. Woylie are a Priority Four species (not reserved by legislation) and are considered by the IUCN to be dependent on conservation for their survival. Woylie have been translocated to Chalk as part of Operation Foxglove. There are 110 records of Woylie occurring in the RFA area, three records are from land that is reserved.

Social Values and Community Attachment

*High aesthetic value*s

Level of reservation: 64% (61% formal)

Amount not reserved: 5 ha[1] Increase in reservation: <0.01%

[1] These 5 ha may be an artifact of the grid system used by the Forest Management Information System.

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Chalk be reserved (along with many other blocks) to extend the Lane-Poole Conservation Reserve. The WAFA argue that the following values belong to this group of blocks: old growth Wandoo forest and woodland and old growth Jarrah forest (using the WAFA's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values. The part of Chalk that the WAFA is referring to is the unreserved part which they wished to see reserved to increase the size and viability of the Lane-Poole reserve.

Chapman

Chapman is 9,360 ha in size, with 2,600 ha reserved (1,290 ha of this are formally reserved). Chapman is one of the "east of Margaret River, west of Sues Rd" group of blocks.
Area being assessed: 6,730 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	8,836	6,728	1.9
Jarrah Woodland	106,374	52.1	27.5	24.6	51	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	433	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	966	632	1.3
BK	21,361	63.6	51.6	12.0	1,003	250	1.2
CE	24,295	46.2	25.7	20.5	1	0	0
JL	16,245	32.8	13.7	19.1	1,463	1,032	6.4
KI	102,240	33.7	26.4	7.3	3,676	3,093	3.0
PR	9,768	21.5	8.8	12.7	324	215	2.2
T	27,829	11.3	8.8	2.5	1,377	1,172	4.2
TL	27,904	32.1	24.1	8.0	81	73	0.3
Tw	8,723	8.0	4.5	3.5	359	262	3.0

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)
Amount not reserved: 6,307 ha Increase in reservation: 3.0%

Area of high flora endemism

Level of reservation: 64% (60% formal)
Amount not reserved: 1,269 ha Increase in reservation: 0.6%

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Reserving areas east of Margaret River and west of Sues Road was raised by local community members at the FMP forum held at Margaret River, 3 September, 2001.

Chester

Chester is 5,140 ha in size, of which 2,750 ha are reserved (1,760 ha are formally reserved).
Area being assessed: 2,350 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	3,478	2,319	0.7
Jarrah Woodland	106,374	52.1	27.5	24.6	69	0	0
Karri West Coast	14,500	30.8	30.7	0.1	20	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	1,477	0	0
Swamps	15,300	42.8	40.0	2.8	10	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
N	17,800	37.8	30.5	7.3	3,425	1,814	10.2
Nw	8,584	45.3	29.5	15.8	1,416	467	5.4
Sd	37,717	32.8	26.3	6.5	133	10	0.03
Swd	10,382	57.3	52.2	5.1	83	27	0.3

Other Biodiversity Values

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 246 ha Increase in reservation: 0.2%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 2,309 ha Increase in reservation: 1.5%

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

High probability of flora species richness

Level of reservation:	75% (69% formal)		
Amount not reserved:	2,269 ha	Increase in reservation:	1.1%

Area of high flora endemism

Level of reservation:	64% (60% formal)		
Amount not reserved:	2,309 ha	Increase in reservation:	1.0%

In Chester, there is a high degree of overlap in areas that have high species richness and also contain relictual and endemic flora.

Threatened Ecological Community (TEC)

There are 2.6 ha of the TEC Scott River Ironstone Heaths in Chester. All 2.6 ha were proposed for reservation in the 1994 Forest Management Plan. This proposal has not yet been gazetted. There are 371 ha of Scott River Ironstone Heaths in the RFA area, 123 ha are formally reserved (reservation level of 33%).

Declared Rare and Priority Flora

There is one population of the Declared Rare species, *Boronia exilis* in Chester. In total, there are nine populations of this species in the RFA area, three occur on land that is formally reserved (reservation level of 33%). The population in Chester is reserved by buffer zones during timber harvesting. Formally protecting the population would increase the reservation level of *B. exilis* by 11%.

There are two populations of the Declared Rare species, *Meziella trifida* in Chester. These populations are not within the State forest area of Chester, but occur in informal road reserves. There are 12 populations of *M. trifida* in the RFA area, nine occur on land that is formally reserved (reservation level of 75%). Formally protecting the two populations in Chester would increase the formal reservation level of *M. trifida* by 22%.

There are numerous records (>10) of Priority Flora occurring in Chester, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). This assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. Some of these records occur on land that is reserved (based on a visual comparison of maps).

Threatened Fauna

There is one record of the Black-stripe Minnow (*Galaxiella nigrostriata*) occurring in Chester. The Minnow is a Priority Three species (not covered by legislation). There are seven records of the Minnow occurring in the RFA area, five records are from land that is reserved.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Chester be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old

growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems.

At the FMP forum held at Margaret River, 3 September 2001, local community members argued for increasing the buffer areas around streams and Rivers in Chester. The same forum raised the issue of reserving Karri forest on the east and west Chester block boundaries. All Karri forest in Chester is already reserved.

Dalgarup *2002 Harvest Plan*

Dalgarup is 3,600 ha in size and 1,160 ha are reserved. 940 ha of this are formally reserved. Area being assessed: 2,340 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,496	2,337	0.4
Karri Main Belt	193,000	48.2	36.2	12.0	81	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	18	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,744	1,200	1.6
BL	59,446	5.5	3.3	2.2	549	446	0.8
BT	21,477	1.8	0.9	0.9	29	25	0.1
CC1	27,443	19.6	10.5	9.1	126	34	0.1
GR	22,047	15.6	8.7	6.9	223	199	0.9
WH1	20,321	34.7	10.9	23.8	446	250	1.2
YN1	23,494	35.5	14.4	21.1	379	184	0.8

Other Biodiversity Values

Dalgarup contains the only occurrence of Karri in the Bridgetown-Greenbushes Shire (The Training and Development Group, 1997). This area is already proposed for reservation.

The Dalgarup Management Priority Area is on the Indicative list of the Register of the National Estate for its natural values (Australian Heritage Commission Register of the National Estate database, searched March 2002). In particular, Dalgarup was recognised as containing the northernmost occurrence of Karri (already proposed for reservation) and that the area, although previously logged, was the best available representation of a forest association that was at that point degraded by timber production operations. In addition, the

entry for Dalgarup indicates that the area provides an excellent example of dissected lateritic uplands of the Blackwood River valley system.

Although Dalgarup is outside the System 6 area, it was considered sufficiently important to be reported on in the 1981 and 1983 System 6 reports (Department of Conservation and Environment, 1981 & 1983). In the 1983 System 6 report it was recognised that Dalgarup was of regional significance because of its high conservation value. The 1983 report again recognised that Dalgarup contains the northernmost occurrence of Karri, as well as a variety of forest types from open-forest of Blackbutt, jarrah and marri to open-forest of Karri. The report recommended that the whole of Dalgarup should be designated a Regional Park, a recommendation that was accepted by the Government of the time but was not implemented.

There has been relatively little recent logging in Dalgarup, with 40 ha of forest logged since the late 1950s.

Social Values and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	17 ha	Increase in reservation:	<0.01%

Dalgarup has been identified as an Indicative National Estate place of social value due to its importance as a place highly valued by a community for reasons of religious, spiritual, symbolic, cultural, educational or social associations (Sub-criterion G1). This criterion is broadly consistent with criteria 4I of the Terms of Reference for this assessment (Appendix One).

There is substantial evidence of current and historical community attachment to Dalgarup in relation to a number of values. The local conservation group, the Bridgetown Greenbushes Friends of the Forests (BGFF), has campaigned to prevent logging in Dalgarup since 1987; although the original purpose of the group was to have input into logging plans in the area. The group currently has around 150 members (mostly local residents and landholders) and is a member group of Friends of the Earth Australia. BGFF has made several submissions in relation to Dalgarup, most recently in September and November 2001. These submissions clearly indicate the BGFF view that Dalgarup has social value of as a large remnant of native forest, in an area which has had considerable logging and clearing for agriculture, which is also accessible by the community. Walk trails in Dalgarup connect with the Bibbulmun track. BGFF also see the potential for Dalgarup to be a substantially sized reserve in the middle of the South-West region, where currently there are few large reserves.

Currently, BGFF are organising a petition to protect all of Dalgarup that will be sent to the Premier, and Ministers for the Environment and Forestry. BGFF has also been involved in public education, publishing “The Jarrah Book” (proceedings of a weekend workshop), putting together an information panel about Dalgarup which is used at local festivals and distributing a short video on Aboriginal connections to Dalgarup (produced by the Blackwood Friends of the Forest). This video provides evidence of the presence of Aboriginal stone artefacts in Dalgarup (unverified, see Section 2.4). The group’s views have also been

reported in the media (The Bridgetown Times, 18/05/94) and a member of BGFF (Mary Frith) has spoken at public meetings.

The submissions made by the BGFF group also include information about historical community activity in relation in Dalgarup. For example, there was a successful community attempt to create a scenic reserve within Dalgarup in 1940. In 1988, a joint effort by the BGFF group, along with the Bridgetown Tourist Bureau, CLM, the Shire President and the Bridgetown Rotary Club formed the Jarrah Park in Dalgarup. The BGFF are responsible for maintaining the facilities for CLM, and have installed a traffic counter at the site: there is an average of 167 visits to the park each month.

In total, 55 letters have been sent to the Minister of the Environment about Dalgarup, the highest number received about any of the blocks included in this assessment. Furthermore, at two of the forums (Manjimup, 30 August 2001 and Margaret River, 3 September 2001) held as part of the development of the Forest Management Plan, the high conservation values of Dalgarup were raised.

The Bridgetown Greenbushes Shire Council passed a motion against logging of native forest within the Shire's boundaries due to community pressure (The Training and Development Group, 1997).

In response to the September announcement that Dalgarup was on the 2002 Indicative Harvest Plan list, the Lorax Forest Protesters set up a camp near Dalgarup to protest against logging in the block.

Biodiversity comments

The submissions made by BGFF also highlight their views as to the biological values of the block, including the presence of a breeding population of Red-tailed Black Cockatoos in the block and many large Jarrahs, Marris and Blackbutts (unverified, see Section 2.4).

The WA Forest Alliance has recommended that Dalgarup, along with Hester and part of Nelson, form a Hester-Dalgarup Conservation Park which would adjoin the existing Dalgarup Reserve. They list several values to support their recommendation, including the presence of old growth forest (using the WA Forest Alliance's definition), biophysical naturalness, aesthetic value, vegetation diversity, presence of northernmost example of Karri forest (proposed reserve) and importance of these forests for salinity control (unverified, see Section 2.4). The Conservation Council has also reported on the high conservation values of the block (Conservation Council, 1994). It should be recognised that some of these values may already be included in the area that is already formally reserved in the block.

Historical information

Dalgarup also has an historical association with the New Zealand Kauri Timber Company, which operated in the area from 1912 to c. 1960s. The surviving bush railway track and associated loading ramps put in by the Timber Company have heritage value and demonstrate a way of life no longer practiced in the region (information supplied by BGFF and unverified, see Section 2.4).

Darradup

Darradup is 5,610 ha in size and 5,420 ha are reserved (5,380 ha of this are formally reserved).
Area being assessed: 190 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,312	187	0.05
Jarrah Woodland	106,374	52.1	27.5	24.6	83	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	197	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	927	22	0.05
BK	21,361	63.6	51.6	12.0	873	20	0.09
CT	3,128	56.9	32.7	24.2	1	0	0
DP	4,088	50.3	42.8	7.5	174	0	0
JL	16,245	32.8	13.7	19.1	233	25	0.2
KI	102,240	33.7	26.4	7.3	2,859	117	0.1
LY	1,429	17.7	4.8	12.9	37	0	0
SS	894	57.9	53.4	4.5	86	4	0.4
TL	27,904	32.1	24.1	8.0	405	0	0

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)
Amount not reserved: 167 ha Increase in reservation: 0.08%

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)
Amount not reserved: 14 ha Increase in reservation: <0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Darradup be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Forest Grove

Forest Grove is 1,330 ha in size of which 1,320 ha are formally reserved. Forest Grove is one of the "east of Margaret River, west of Sues Rd" group of blocks to be assessed by Ecoscape.

Area being assessed: 10 ha, all of which is exotic or cleared land.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	534	0	0
Jarrah Leeuwin	56,400	15.3	14.7	0.6	669	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	9	0	0
Karri West Coast	14,500	30.8	30.7	0.1	30	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	62	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BK	21,361	63.6	51.6	12.0	107	0	0
C1	18,982	13.5	12.3	1.2	315	0	0
Cw1	6,144	10.1	9.8	0.3	12	0	0
H	7,709	8.6	8.6	0	66	0	0
Hw	2,736	7.6	7.6	0	20	0	0
T	27,829	11.3	8.8	2.5	368	0	0
Td	169	66.2	66.2	0	31	0	0
Tw	8,723	8.0	4.5	3.5	51	0	0
W1	7,296	27.9	25.3	2.6	297	0	0
Ww1	2,268	23.3	19.6	3.7	44	0	0

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Forest Grove.

Social Values and Community Attachment

Forest Grove has been identified as an Indicative National Estate place of social value (Commonwealth and Western Australian RFA Steering Committee, 1998d). This and other social values associated with Forest Grove are protected as almost the entire block is reserved.

Hester

Hester is 5,870 ha in size, 5,800 ha are formally reserved.
Area being assessed: 40 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	1,479	0	0
Jarrah North West	670,600	19.3	13.9	5.4	4,239	42	0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	0.5	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	39	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	54	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	236	0	0
BT	21,477	1.8	0.9	0.9	20	0	0
CC1	27,443	19.6	10.5	9.1	906	0	0
D1	208,271	14.7	10.0	4.7	2,161	0	0
DM1	7,434	11.5	10.5	1.0	474	0	0
GR	22,047	15.6	8.7	6.9	123	9	0.04
HR	32,250	24.6	22.2	2.4	824	33	0.1
KU1	1,006	24.0	24.0	0	241	0	0
LK1	5,224	10.2	9.4	0.8	432	0	0
NW1	6,315	1.6	1.0	0.6	66	0	0
NWg1	20,694	4.2	4.1	0.1	329	0	0

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in Hester.

Social Values and Community Attachment

There is a considerable amount of information relating to the social values in Hester and the level of community attachment to Hester. For example, the block was identified as an Indicative National Estate place of social value (Commonwealth and Western Australian RFA Steering Committee, 1998d), The Bridgetown-Greenbushes Friends of the Forests (BGFF) have campaigned about logging in Hester, the WAFA proposed reserving the entire block to form the Hester-Dalgarup Conservation Park and the history of the block has been assessed and recorded. This assessment indicated that the town of Hester has had a continuous association with Hester block, and local community members value the visual qualities of Hester as a forested area within a landscape dominated by farmland.

As almost the entire block is now reserved, the values identified by various community members and groups are now almost completely protected. However, Mary Frith as a representative of BGFF stated in a phone conversation (20/02/02) that the 40 ha of unreserved land in Hester is of the same value as the rest of the block and should be reserved. Her view was that retaining a small area of the block for timber operations was puzzling.

Hovea

Hovea is 3,040 ha in size, with 1,450 ha reserved (1,310 ha of this are formally reserved). Area being assessed: 1,600 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	2,597	1,355	0.2
Jarrah Sandy	107,900	26.1	22.9	3.2	399	241	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	31	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	11	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
CC1	27,443	19.6	10.5	9.1	1,252	753	2.7
D1	208,271	14.7	10.0	4.7	1,193	602	0.3
GR	22,047	15.6	8.7	6.9	165	0	0
WG	38,161	25.0	24.3	0.7	427	241	0.6

Other Biodiversity Values

There are no other biodiversity values that meet the criteris in Appendix One.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Hovea, along with Kerr, Catterick, Munro, Preston and Hunt, be reserved to form a Kerr Conservation Park (which would connect with the Noggerup Conservation Park). The values that WAFA identified as belonging to these blocks were: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); endangered species; aesthetic values; and salinity control (unverified, see Section 2.4). The part of Hovea that WAFA refer to is the unreserved part of the block.

Leonie van der Maesen made a submission arguing that Hovea has a very steep topography and forms a watershed for a branch of the Preston River (unverified, see Section 2.4).

Hunt

Hunt is 5,900 ha in size, of which 670 ha are informally reserved.
Area being assessed: 5,230 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Sandy	107,900	26.1	22.9	3.2	5,237	4,872	4.5
Jarrah Woodland	106,374	52.1	27.5	24.6	126	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	90	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	360	295	0.08
Wandoo Woodland	163,000	23.8	19.0	4.8	52	27	0.02

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
CI	11,005	13.8	9.4	4.4	938	925	8.4
Pn	166,694	33.6	23.9	9.7	1,172	933	0.6
S	53,656	47.3	29.1	18.2	88	51	0.1
SK	1,812	49.2	28.8	20.4	1,089	755	41.7
WG	38,161	25.0	24.3	0.7	2,578	2,532	6.6

Other Biodiversity Values

High biophysical naturalness (90 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Hunt, along with Kerr, Catterick, Munro, Preston and Hovea, be reserved to form a Kerr Conservation Park (which would connect with the Noggerup Conservation Park). The values that WAFA identified as belonging to these blocks were: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); endangered species; aesthetic values; and salinity control. The WAFA argue that reserving these blocks will make the existing reserves in the area viable (unverified, see Section 2.4).

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Kerr

Kerr is 2,940 ha in size, of which 640 ha are reserved (130 ha are formally reserved).
Area being assessed: 2,180 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	2,924	2,170	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	2	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	3	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	414	283	0.5
BLf	2,972	0.7	0.5	0.2	13	7	0.2
CC1	27,443	19.6	10.5	9.1	543	343	1.3
D1	208,271	14.7	10.0	4.7	3	3	<0.01
GR	22,047	15.6	8.7	6.9	292	240	1.1
HR	32,250	24.6	22.2	2.4	1,396	1,197	3.7
KR	3,459	19.2	15.5	3.7	148	96	2.8

Other Biodiversity Values

Threatened Fauna

There are three records of Chuditch occurring in Kerr. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of which occur on gazetted reserved land.

Social Values and Community Attachment

In 1994 the 'Kerr Rescue Campaign' started. For two weeks, 70 protesters blockaded access to the forest. There was a subseqent 10-day interim injunction on logging in the block. A report by the Conservation Council (1994) mentioned that "Kerr had been the subject of long running and widely supported community campaign for its protection".

Since at least 1998 the Balingup Friends of the Forest Group (a relatively small local group) has been working towards the reservation of 132 ha of what they argue is unlogged mature Jarrah forest in Kerr (unverified; this is the same area as that proposed for reservation by the WAFA – see below). In 2001, Kerr Conservation (a group representing a larger group of the community) published a booklet outlining the proposal by the local Balingup community to reserve the 132 ha and the ecological, recreational, social, cultural and visual values that the community believes the area holds. The booklet also argues that Balingup is increasingly becoming a tourist town and how the proposed reserve can provide a further tourist attraction. These 132 ha are now proposed for formal reservation. However, local

community members are concerned about the lack of progress in gazetting the reserve and consultation over the boundaries of the reserve. The local community has invited the Minister for the Environment and Heritage to visit the area; this invitation has not been taken up.

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Kerr, along with Hunt, Catterick, Munro, Preston and Hovea, be reserved to form a Kerr Conservation Park (which would connect with the Noggerup Conservation Park). The values that WAFA identified as belonging to these blocks were: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); endangered species; aesthetic values; and salinity control. The WAFA argue that reserving these blocks will improve the viability of the existing reserves in the area (unverified, see Section 2.4).

The Conservation Council (1994) argued that Kerr was a remnant area in the Balingup district of high conservation value old growth Jarrah forest.

McAlinden

McAlinden is 2,190 ha in size, of which 270 ha are informally reserved.
Area being assessed: 1,920 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	62	51	0.01
Jarrah Sandy	107,900	26.1	22.9	3.2	1,898	1,736	1.6
Jarrah Woodland	106,374	52.1	27.5	24.6	32	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	40	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	134	115	0.03
Wandoo Woodland	163,000	23.8	19.0	4.8	14	11	0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
CC1	27,443	19.6	10.5	9.1	152	116	0.4
GR	22,047	15.6	8.7	6.9	62	51	0.2
Pn	166,694	33.6	23.9	9.7	577	456	0.3
WG	38,161	25.0	24.3	0.7	1,389	1,291	3.4

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in McAlinden.

Social Values and Community Attachment

At the FMP forum held at Collie, 29 August 2001, McAlinden was listed as part of a group 15 blocks which the local community wanted to be reserved. Local community members put forward the following reasons for reserving this group of blocks (unverified, see Section 2.4):

- The blocks have not been subject to woodchip prescription and therefore, retain much of their conservation value;
- The blocks contain Jarrah forest, which is not adequately represented in the reserve system in the South-West and Swan regions;
- The blocks should form part of the Wellington/Collie public water supply catchment; and
- In general the blocks have many heritage values (e.g. old mill sites, timber rail lines, use for recreational purposes) and reservation will allow retention of historical values for future generations.

Molloy

Molloy is 4,130 ha in size, with 840 ha informally reserved. Molloy is one of the "east of Margaret River, west of Sues Rd" group of blocks to be assessed by Ecoscape.
Area being assessed: 3,290 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	3,506	3,254	0.9
Jarrah Woodland	106,374	52.1	27.5	24.6	18	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	573	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	71	57	0.1
CE	24,295	46.2	25.7	20.5	881	661	2.7
KI	102,240	33.7	26.4	7.3	871	801	0.8
PR	9,768	21.5	8.8	12.7	1,100	693	7.1
T	27,829	11.3	8.8	2.5	697	603	2.2
TL	27,904	32.1	24.1	8.0	437	397	1.4
Tw	8,723	8.0	4.5	3.5	41	41	0.5

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 219 ha Increase in reservation: 0.1%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 232 ha Increase in reservation: 0.1%

Declared Rare and Priority Flora

There are two records of Priority Flora occurring in Molloy, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block. All the records occur on land that is reserved in Molloy.

Threatened Fauna

There is one record each of both the Malleefowl and Baudin's Cockatoo occurring in Molloy. Both species are listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and are considered vulnerable by the IUCN. There are seven records of the Malleefowl occurring in the RFA area, one of which occurs on gazetted reserved land. There are 28 records of Baudin's Cockatoo occurring in the RFA area, with one record from gazetted reserved land.

Social Values and Community Attachment

Local community members proposed reserving all areas east of Margaret River and west of Sues Road at the Margaret River FMP forum, 3 September 2001.

Moonah

Moonah is 6,340 ha in size, 5,230 ha are reserved (5,100 ha are formally reserved). Within the State forest of Moonah there are a further 30 ha of old growth forest that is informally reserved and set aside from timber harvesting.

Area being assessed: 1,080 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,156	1,045	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	180	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	837	0	0
Swamps	15,300	42.8	40.0	2.8	65	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	409	104	0.2
CE	24,295	46.2	25.7	20.5	253	89	0.4
KI	102,240	33.7	26.4	7.3	1,002	735	0.7
MP	3,966	29.5	25.7	3.8	25	8	0.2
N	17,800	37.8	30.5	7.3	2,228	2	0.01
Nd	2,379	57.6	52.3	5.3	942	14	0.6
Nw	8,584	45.3	29.5	15.8	1,272	92	1.1
Sd	37,717	32.8	26.3	6.5	18	0	0
Swd	10,382	57.3	52.2	5.1	90	0	0

Other Biodiversity Values

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 18 ha Increase in reservation: 0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 989 ha Increase in reservation: 0.5%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 222 ha Increase in reservation: 0.1%

Declared Rare and Priority Flora

There is one record of a Priority Flora occurring in Moonah, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). This Priority species occurs on land that is reserved (based on a visual comparison of maps).

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Moonah be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Morgan

Morgan is 4,060 ha in size, with 320 ha reserved (10 ha are formally reserved).
Area being assessed: 3,740 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	3,478	3,287	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	6	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	39	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	514	435	0.1
Wandoo Woodland	163,000	23.8	19.0	4.8	19	15	0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ck	133,887	15.0	11.1	3.9	113	96	0.07
D4	132,414	24.0	20.6	3.4	2,641	2,526	1.9
Mi[1]	134,539	6.4	4.6	1.8	90	55	0.04
Pn	166,694	33.6	23.9	9.7	764	623	0.4
S	53,656	47.3	29.1	18.2	37	28	0.05
Y5	124,375	26.8	19.6	7.2	412	409	0.3

Other Biodiversity Values

High biophysical naturalness

Level of reservation: 98% (88% formal)
Amount not reserved: 1 ha[2] Increase in reservation: <0.01%

Social Values and Community Attachment

Biodiversity comments

The WA Forest Alliance proposed in 1998 that all of Morgan be reserved (along with many other blocks) to extend the Lane-Poole Conservation Reserve to improve its viability. The WAFA argue that the following values belong to this group of blocks: old growth Wandoo forest and woodland and old growth Jarrah forest (using the WAFA's definition of old growth); Blackbutt and River Banksia communities; areas of relatively high biophysical naturalness and wilderness quality; and high aesthetic values (unverified, see Section 2.4).

[1] The Mi complex occurs mainly outside the RFA area.
[2] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Mowen

Mowen is 10,190 ha in size, of which 1,630 ha are reserved (840 ha are formally reserved). Mowen is part of the area "east of Margaret River and west of Sues Road" that was included in this assessment.

Area being assessed: 8,550 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	9,855	8,548	2.5
Jarrah Woodland	106,374	52.1	27.5	24.6	28	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	6	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	230	0	0
Swamps	15,300	42.8	40.0	2.8	61	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	809	685	1.4
BK	21,361	63.6	51.6	12.0	334	270	1.3
CE	24,295	46.2	25.7	20.5	2,398	1,798	7.4
JL	16,245	32.8	13.7	19.1	842	665	4.1
KI	102,240	33.7	26.4	7.3	3,027	2,817	2.8
PR	9,768	21.5	8.8	12.7	183	152	1.6
TL	27,904	32.1	24.1	8.0	2,588	2,160	7.7

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 4,947 ha Increase in reservation: 2.3%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 64 ha Increase in reservation: 0.03%

Declared Rare and Priority Flora

There are two populations of the Declared Rare species, *Drakaea micrantha* in Mowen. There are 14 populations of this species in the RFA area, nine of which occur on reserved land (reservation level of 64%). The populations in Mowen are protected by exclusion during timber harvesting operations. Formally reserving *D. micrantha* in Mowen would increase the reservation level of the species by 14%.

Social Values and Community Attachment

The Australian Conservation Foundation (1987) recommended changing the status of the proposed Forest Park/Reserve in Mowen to a Nature Reserve.

Local community members proposed that all areas west of Margaret River and east of Sues Road be reserved at the FMP forum held at Margaret River, 3 September 2001.

Mullalyup *2002 Harvest Plan*

Mullalyup is 7,910 ha in size, with 2,900 ha reserved, of which 2,360 ha are formally reserved.

Area being assessed: 4,940 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Darling Scarp	29,000	7.8	7.6	0.2	21	20	0.07
Jarrah North West	670,600	19.3	13.9	5.4	7,641	4,904	0.7
Jarrah Sandy	107,900	26.1	22.9	3.2	10	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	71	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	54	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	1,225	636	1.1
BO	3,578	23.3	0	23.3	23	17	0.5
BT	21,477	1.8	0.9	0.9	59	55	0.3
CC1	27,443	19.6	10.5	9.1	879	555	2.0
DS	29,108	7.8	7.6	0.2	21	20	0.1
G	27,262	56.8	52.6	4.2	10	0	0
GR	22,047	15.6	8.7	6.9	1,796	1,066	4.8
HR	32,250	24.6	22.2	2.4	2,918	2,020	6.3
KR	3,459	19.2	15.5	3.7	879	547	15.8
S	53,656	47.3	29.1	18.2	10	9	0.02

Other Biodiversity Values

High biophysical naturalness (79 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 20 ha Increase in reservation: <0.01%

Threatened Fauna

There is one record of a Chuditch occurring in Mullalyup. Chuditch is listed as being rare or likely to go extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by

the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of which occur on gazetted reserved land.

Corridors and Linkages

Part of Mullalyup has the potential to act as corridor between two 1994 Forest Management Plan proposed reserves. Mullalyup block in total could act as a link between other reserves in the area.

Social Value and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 49 ha Increase in reservation: <0.01%

In 1977 the Forest Department proposed establishing a Management Prioirity Area in Mullalyup of 4,234 ha. According to the WAFA this raised the expectation in the community that over half of Mullalyup would be reserved (unverified, see Section 2.4).

In 1987, various conservation groups, under the umbrella of the Australian Conservation Foundation, recommended that Mullalyup be made a State Park (Australian Conservation Foundation, 1987).

Biodiversity comments

The WA Forest Alliance recommended that Mullalyup should become a Conservation Park because of the presence of old growth Jarrah-Marri forest (using the WA Forest Alliance's broader definition of old growth), Blackbutt and River Banksia communities in the block. In addition, the WA Forest Alliance argue that Mullalyup has aesthetic appeal, high vegetation diversity and is important for salinity control (unverified, see Section 2.4).

Munro

Munro is 3,640 ha in size, 490 ha are informally reserved.

Area being assessed: 3,150 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	3,568	3,154	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	2	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	70	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	179	98	0.2
CC1	27,443	19.6	10.5	9.1	718	585	2.1
D1	208,271	14.7	10.0	4.7	531	531	0.3
GR	22,047	15.6	8.7	6.9	632	547	2.5
HR	32,250	24.6	22.2	2.4	1,578	1,392	4.3

Other Biodiversity Values

Threatened Fauna

There is one record of Chuditch occurring in Munro. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of these records are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 105 ha Increase in reservation: 0.02%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that part of Munro be reserved, along with Kerr, Catterick, Preston, Hovea and Hunt, to form the Kerr Conservation Park which would connect with the Noggerup Conservation Park. The values that WAFA identified as belonging to these blocks were: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); endangered species; aesthetic values; and salinity control. The WAFA argue that reserving these blocks will improve the viability of the existing reserves in the area (unverified, see Section 2.4). The current informally reserved area in Munro does not fulfil the WA Forest Alliance's recommendation.

Nelson

Nelson is 6,090 ha in size, of which 1,400 ha are reserved (410 ha are formally reserved).
Area being assessed: 4,410 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	5,050	3,955	0.7
Jarrah Woodland	106,374	52.1	27.5	24.6	6	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	704	450	0.2
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	39	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	2,853	2,340	3.0
BL	59,446	5.5	3.3	2.2	545	415	0.7
CC1	27,443	19.6	10.5	9.1	756	512	1.9
CRb	52,753	38.6	29.7	8.9	211	203	0.4
GR	22,047	15.6	8.7	6.9	132	104	0.5
WH1	20,321	34.7	10.9	23.8	493	284	1.4
YN1	23,494	35.5	14.4	21.1	811	547	2.3

Other Biodiversity Values

Declared Rare and Priority Flora

There is one population of the Declared Rare species, *Caladenia harringtoniae* in Nelson. There are 40 populations of C*. harringtoniae* in the RFA area, 14 of which occur on reserved land (reservation level of 35%). The population in Nelson is protected by exclusion during timber harvesting operations. Formally reserving the population would increase the reservation level of *C. harringtoniae* by 2.5%.

Threatened Fauna

There are three records of Quokka occurring in Nelson. Quokka are listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 126 records of Quokka occurring in the RFA area, four are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 33 ha Increase in reservation: 0.01%

Biodiversity comments

In 1998 the WA Forest Alliance proposed that part of Nelson be reserved, along with Hester and Dalagrup, to form the Hester-Dalgarup Conservation Park (which would adjoin the Dalgarup Reserve). They list several values to support their recommendation, including the presence of old growth forest (using the WA Forest Alliance's definition), biophysical naturalness, aesthetic value, vegetation diversity, presence of northernmost example of Karri forest (proposed reserve) and importance of these forests for salinity control (unverified, see Section 2.4). WAFA do not believe that the part of Nelson that is currently reserved is sufficient to fulfil their recommendation.

Preston *2002 Harvest Plan*

Preston is 5,470 ha in size of which 1,570 ha are reserved (880 ha formally reserved).

Area being assessed: 3,780 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	5,423	3,764	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	20	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	9	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	396	249	0.4
CC1	27,443	19.6	10.5	9.1	1,164	847	3.1
D1	208,271	14.7	10.0	4.7	1,763	1,337	0.6
GR	22,047	15.6	8.7	6.9	1,024	572	2.6
HR	32,250	24.6	22.2	2.4	986	760	2.4

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Preston.

Social Value and Community Attachment

In 1977 the Forest Department proposed establishing a Management Priority Area in Preston of 2,707 ha. According to WAFA this raised the expectation in the community that around half of Preston would be reserved.

The Preston Environment Group was formed in 1987 and as part of its activities, campaigns on behalf of Preston, indicating local community attachment to the block. No information on submissions made by the group was obtained during this assessment. However, public meetings and petitions have been organised by local community members since the RFA, which changed the status of the area proposed in Preston to form the Preston Conservation Park to State forest. Local community members felt they had not been consulted during this process and processes related to the announcement to log Preston compartments 1 and 5.

In 1987, various conservation groups, under the umbrella of the Australian Conservation Foundation, recommended that Preston be made a State Park (Australian Conservation Foundation, 1987). In 1994, the Conservation Council recommended that Preston be of the highest priority for conservation (Conservation Council, 1994).

The Minister for the Environment has received six letters in relation to Preston from community members, indicating some community interest in the block.

The Bibbulmun track passes through Preston. 200 m wide informal and formal reserves buffer either side of the track.

Biodiversity comments

The WA Forest Alliance recommended in 1998 that part of Preston, along with part or all of five other blocks, be included in their proposed new Kerr Conservation Park, which would connect with the existing Noggerup Conservation Park. The values listed for these blocks are: old growth jarrah-marri forest (using the WA Forest Alliance's definition of old growth), endangered species, aesthetic values and salinity control (unverified, see Section 2.4)

Rapids *2002 Harvest Plan*

Rapids is 8,400 ha in size with 3,110 ha reserved, of which 2,370 ha are formally reserved.
Area being assessed: 5,280 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	7,919	5,228	1.5
Jarrah Woodland	106,374	52.1	27.5	24.6	30	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	388	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	674	219	0.5
CE	24,295	46.2	25.7	20.5	1,785	1,354	5.6
JL	16,245	32.8	13.7	19.1	175	142	0.9
KI	102,240	33.7	26.4	7.3	2,104	1,454	1.4
PR	9,768	21.5	8.8	12.7	1,594	514	5.3
T	27,829	11.3	8.8	2.5	253	2	<0.01
TL	27,904	32.1	24.1	8.0	1,706	1,543	5.5
Tw	8,723	8.0	4.5	3.5	47	0	0

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)
Amount not reserved: 1,043 ha Increase in reservation: 0.5%

Area of high flora endemism

Level of reservation: 64% (60% formal)
Amount not reserved: 466 ha Increase in reservation: 0.2%

Declared Rare and Priority Flora

There are seven records of Priority Flora occurring in Rapids, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report,

Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these seven records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Social Value and Community Attachment

In 1987, various conservation groups, under the umbrella of the Australian Conservation Foundation, recommended that Rapids be made a Nature Reserve (Australian Conservation Foundation, 1987).

Margaret River, which has both indigenous and non-indigenous cultural and heritage importance, passes through the top of Rapids. Informal reserves (c. 200 m wide each side) and formal reserves occur along both sides of the River.

Red Gully

Redgully is 5,330 ha in size, of which 1,140 ha are reserved. 20 ha are formally reserved. There is a further 510 ha of old-growth forest in the part of Red Gully currently intended to remain State forest available for multiple use which will be protected by the exclusion of timber harvesting operations.

Area being assessed: 3,670 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	4,946	3,664	1.1
Jarrah Woodland	106,374	52.1	27.5	24.6	159	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	215	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	1,170	571	1.2
DP	4,088	50.3	42.8	7.5	8	0	0
JL	16,245	32.8	13.7	19.1	957	567	3.5
KI	102,240	33.7	26.4	7.3	2,563	2,154	2.1
MP	3,966	29.5	25.7	3.8	277	241	6.1
SS	894	57.9	53.4	4.5	20	18	2.0
TL	27,904	32.1	24.1	8.0	326	114	0.4

Other Biodiversity Values

High probability of flora species richness

Level of reservation:	75% (69% formal)		
Amount not reserved:	836 ha	Increase in reservation:	0.4%

Area of high flora endemism

Level of reservation:	64% (60% formal)		
Amount not reserved:	2 ha[1]	Increase in reservation:	<0.01%

Corridors and Linkages

Red Gully could act as a corridor between the new proposed reserve in Darradup (proposed under the Government's "*Protecting our old growth forests*" policy) and a reserve proposed during the RFA to the south. Informal reserves in Red Gully already act as a corridor between these reserved areas.

Social Values and Community Attachment

High aesthetic value

Level of Reservation:	64% (61% formal)		
Amount not reserved:	14 ha	Increase in reservation:	<0.01%

During the RFA process, Red Gully was identified as having social value during a community workshop held at Nannup, but community members did not provide any documentation to support this claim (The Training and Development Group, 1997).

Between February and October 2001, two letters were sent to the Minister for the Environment and Heritage about Red Gully.

Biodiversity comments

The WA Forest Alliance argued that Red Gully contains "high quality wetlands at risk from the spread of dieback through roading and logging" in a letter to the Minister for the Environment and Heritage (12/01/01, unverified, see Section 2.4).

The Busselton Dunsborough Environment Centre committee argue that "Red Gully is biodiverse", with areas of old growth forest, wetlands and heathlands in a letter to the Minister (20/01/02) and the group's view was that the block should have been placed under moratorium until the review of High Conservation Values was completed. All such areas in Red Gully are already reserved or will not be subject to timber harvesting.

Roseneath *2002 Harvest Plan*

Roseneath is 5,550 ha in size and 1,790 ha are reserved. 1,330 ha of this are formally reserved.

Area being assessed: 3,750 ha

[1] These 2 ha may be an artifact of the grid system used by the Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	2,698	2,249	0.3
Jarrah Sandy	107,900	26.1	22.9	3.2	2,637	1,484	1.4
Jarrah Woodland	106,374	52.1	27.5	24.6	129	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	35	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	4	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	40	15	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	45	28	0.05
D1	208,271	14.7	10.0	4.7	1,650	1,614	0.8
GR	22,047	15.6	8.7	6.9	286	193	0.9
Pn	166,694	33.6	23.9	9.7	1,077	781	0.5
QW	1,418	11.2	11.1	0.1	13	13	0.9
S	53,656	47.3	29.1	18.2	4	3	<0.01
WG	38,161	25.0	24.3	0.7	1,591	701	1.8
Yg1	80,061	29.7	10.3	19.4	419	67	0.1
Yg2	50,259	31.6	11.0	20.6	457	349	0.7

Other Biodiversity Values

There are no other biodiversity features in Roseneath that meet the criteria in Appendix One.

Social Value and Community Attachment

At the FMP forum held in Collie (29 August 2001), community members argued for reserving Roseneath. During the forum, comments were made indicating the part of the local community felt that the region did not have enough representation of HCV forest and many areas had been relatively untouched by logging, making them ideal candidates. CLM data indicates that there has been no logging in Roseneath since *c*. 1970.

Biodiversity comments

The WA Forest Alliance has recommended that part of Roseneath, along with many other blocks, be included in their proposed Wellington National Park. The values listed by WA Forest Alliance as pertaining to these blocks include: old growth Jarrah, Marri and Blackbutt forests, River Banksia communities, vegetation diversity, endangered species and fauna species richness, biophysical naturalness and salinity control (unverified, see Section 2.4).

Schroeder

Schroeder is 9,990 ha in size of which 4,460 ha are reserved. Of this 2,580 ha are formally reserved. There are a further 10 ha of old-growth forest in the part of Schroeder currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 5,500 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	8,195	5,454	1.6
Jarrah Woodland	106,374	52.1	27.5	24.6	239	0	0
Karri West Coast	14,500	30.8	30.7	0.1	6	3	0.02
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	1,455	0	0
Swamps	15,300	42.8	40.0	2.8	20	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BK	21,361	63.6	51.6	12.0	1,262	165	0.8
KI	102,240	33.7	26.4	7.3	350	39	0.04
N	17,800	37.8	30.5	7.3	4,731	3,522	19.8
Nd	2,379	57.6	52.3	5.3	694	437	18.4
Nw	8,584	45.3	29.5	15.8	2,661	1,295	15.1

Other Biodiversity Values

High concentration of relictual flora

Level of Reservation: 68% (62% formal)

Area not reserved: 5,426 ha Increase in reservation: 3.6%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 4,655 ha Increase in reservation: 2.2%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 4,889 ha Increase in reservation: 2.2%

Declared Rare and Priority Flora

There are nine records of Priority Flora occurring in Schroeder, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if

they reflect the occurrence of several Priority species in the block. All the records occur on land that is reserved in Schroeder.

Social Values and Community Attachment

High aesthetic value

Level of Reservation: 64% (61% formal)

Amount not reserved: 114 ha Increase in reservation: 0.02%

Two letters about Schroeder were sent to the Minister for the Environment and Heritage between February 2001 and October 2001.

Sherwood

Sherwood is 4,420 ha in size, with 630 ha informally reserved.
Area being assessed: 3,800 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North West	670,600	19.3	13.9	5.4	4,298	3,759	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	85	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	8	6	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BL	59,446	5.5	3.3	2.2	62	34	0.06
D1	208,271	14.7	10.0	4.7	2,447	2,318	1.1
GR	22,047	15.6	8.7	6.9	103	94	0.4
QW	1,418	11.2	11.1	0.1	3	1	0.07
Yg1	80,061	29.7	10.3	19.4	1,236	903	1.1
Yg2	50,259	31.6	11.0	20.6	539	416	0.8

Other Biodiversity Values

There are no other biodiveristy values in Sherwood that meet the criteria in Appendix One.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 65 ha Increase in reservation: 0.01%

Biodiversity comments

In 1998 the WA Forest Alliance proposed reserving part of Sherwood, along with several other blocks, to connect with the Wellington National Park. The WAFA listed the following values as belonging to this group of blocks: old growth Jarrah, Marri and Blackbutt forests (using the WAFA's definition of old growth); River Banksia communities; vegetation diversity; endangered species and fauna species richness; biophysical naturalness values; and salinity control (unverified, see Section 2.4). This proposed extension of the Wellington National Park included blocks that were under moratorium from timber harvesting. The lifting of the this moratorium from the blocks between Wellington National Park and Sherwood limits the ability of Sherwood to connect and extend the National Park as envisaged by the WAFA.

Sollya

Sollya is 2,450 ha in size, with 490 ha reserved (190 ha are formally reserved). There are a further 10 ha of old growth forest in the part of Sollya currently intended to remain State forest available for multiple use which is protected by exclusion during timber harvesting operations.

Area being assessed: 1,930 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	2,348	1,932	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	77	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	16	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	211	152	0.3
BK	21,361	63.6	51.6	12.0	106	98	0.5
DP	4,088	50.3	42.8	7.5	63	39	1.0
JL	16,245	32.8	13.7	19.1	347	225	1.4
KI	102,240	33.7	26.4	7.3	956	876	0.9
LY	1,429	17.7	4.8	12.9	158	110	7.7
MP	3,966	29.5	25.7	3.8	603	432	10.9

Other Biodiversity Values

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 1,397 ha Increase in reservation: 0.7%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 33 ha Increase in reservation: 0.01%

Corridors and Linkages

Sollya could act as a corridor between new reserves to the south of Sollya and the Blackwood River system and the new proposed reserve in Darradup.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved 113 ha Increase in reservation: 0.02%

Biodiversity comments

In 1998 the WA Forest Alliance recommended that all of Sollya be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values as belonging to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4).

Stockyard

Stockyard is 5,770 ha in size, of which 3,480 ha are reserved (3,330 ha are in formal reserves). There are an additional 1,060 ha of old growth forest in the part of Stockyard currently intended to remain State forest available for multiple use which is protected by exclusion during timber harvesting operations.

Area being assessed: 1,240 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	5,027	1,171	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	9	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	75	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	482	43	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	179	25	0.02
Rocky Outcrops	26,400	44.8	29.1	15.7	2	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ck	133,887	15.0	11.1	3.9	26	24	0.02
D4	132,414	24.0	20.6	3.4	4,108	1,024	0.8
Pn	166,694	33.6	23.9	9.7	1,608	192	0.1
S	53,656	47.3	29.1	18.2	33	0	0

Other Biodiversity Values

There are no other biodiversity values in Stockyard that meet the criteria in Appendix One.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Storry

Storry is 5,530 ha in size, 2,930 ha are informally reserved. There are a further 690 ha of old growth forest in the part of Storry currently intended to remain State forest available for multiple use which is protected by exclsuion during timber harvesting operations.

Area being assessed: 1,910 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	3,376	1,854	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	415	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	1,665	0	0

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ba	1,469	54.8	1.8	53.0	369	23	1.6
BD	47,785	46.8	28.4	18.4	133	51	0.1
BR	11,215	0.7	0.7	0	0.5	0	0
CE	24,295	46.2	25.7	20.5	665	225	0.9
CV	2,038	64.1	63.2	0.9	18	6	0.3
JN	4,692	59.5	43.3	16.2	543	214	4.6
KI	102,240	33.7	26.4	7.3	2,115	1,068	1.0
Sd	37,717	32.8	26.3	6.5	1,357	267	0.7
Swd	10,382	57.3	52.2	5.1	273	16	0.2

Other Biodiversity Values

High biophysical naturalness

Level of reservation: 98% (88% formal)

Amount not reserved: 16 ha Increase in reservation: <0.01%

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 48 ha Increase in reservation: 0.04%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 370 ha Increase in reservation: 0.2%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 457 ha Increase in reservation: 0.2%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 355 ha Increase in reservation: 0.2%

Centre of fauna endemism

Level of reservation: 85% (80% formal)

Amount not reserved: 4 ha[1] Increase in reservation: 0.1%

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 10 ha Increase in reservation: 0.01%

[1] These 4 ha may be an artifact of the grid system used by the Forest Management Information System.

Corridors and Linkages

Storry, along with Central, Cleave and Bidella could act as a corridor between proposed reserves to the west and east as a consequence of the Government's "*Protecting our old growth forests*" policy. Informal reserves in these blocks already accomplish this to a large degree.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 53 ha Increase in reservation: 0.01%

Biodiversity comments

The WA Forest Alliance proposed in 1998 that the part of Storry containing old growth forest be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4). All old growth forest (using the JANIS operational definition) is now informally reserved in Storry. However, there may be areas of forest in Storry that are old growth, using the WAFA's definition, that are not reserved.

Telerah

Telerah is 5,320 ha in size, of which 3,890 ha are reserved (3,100 ha are formally reserved). There are a further 630 ha of old growth forest in the part of Telerah currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 810 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Darling Scarp	29,000	7.8	7.6	0.2	30	0	0
Jarrah Blackwood	347,200	31.2	23.9	7.3	4,151	806	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	266	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	865	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	534	12	0.03
CE	24,295	46.2	25.7	20.5	2,077	404	1.7
DS	29,108	7.8	7.6	0.2	30	0	0
GA	1,122	17.6	11.6	6.0	66	5	0.5
KI	102,240	33.7	26.4	7.3	1,684	299	0.3
TL	27,904	32.1	24.1	8.0	771	78	0.3
WS2	3,332	35.5	28.7	6.8	150	8	0.2

Other Biodiversity Values

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Social Values and Community Attachment

A submission from Leonie van der Maesen indicated that there is a tree within Telerah that was used as a fire look-out and still has the wooden steps imbedded in the tree, suggesting that this area has some historical significance.

Biodiversity comments

The WA Forest Alliance proposed in 1998 that the part of Telerah containing old growth forest be reserved (along with many other blocks) to form a Blackwood National Park (which would incorporate Milyeannup Nature Reserve and adjoin the D'Entrecasteaux National Park and other reserves). The WAFA listed the following values, which in their view, belonged to the group of blocks: old growth Jarrah-Marri forest (using the WAFA's definition of old growth); wetlands; endangered fauna; high floristic species richness; vegetation diversity; wilderness and biophysical naturalness values; and freshwater ecosystems (unverified, see Section 2.4). All old growth forest (using the JANIS operational definition) in Telerah is now reserved, either formally or informally. There may be areas of forest that are old growth as defined by the WAFA that are not reserved.

The Conservation Council (1994) argued that Telerah contained unique flora and a high level of faunal diversity because of its poor soils. They proposed that the area be reserved.

Treeton

Treeton is 5,680 ha in size, with 920 ha informally reserved. Treeton is one of the "east of Margaret River, west of Sues Rd" groups of blocks that was included in this assessment.
Area being assessed: 4,700 ha

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,092	4,630	1.3
Jarrah Woodland	106,374	52.1	27.5	24.6	200	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	290	0	0
Swamps	15,300	42.8	40.0	2.8	6	0	0
Swan Coastal Plain vegetation[1]		Data not available			37	26	N/a

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	15	13	0.03
CE	24,295	46.2	25.7	20.5	169	123	0.5
KI	102,240	33.7	26.4	7.3	487	422	0.4
PR	9,768	21.5	8.8	12.7	525	383	3.9
T	27,829	11.3	8.8	2.5	3,448	2,973	10.7
Tw	8,723	8.0	4.5	3.5	947	757	8.7

Other Biodiversity Values

High biophysical naturalness

Level of reservation: 98% (88% formal)

Amount not reserved: 62 ha Increase in reservation: 0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 3,303 ha Increase in reservation: 1.6%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 231 ha Increase in reservation: 0.1%

Threatened Ecological Community (TEC)

There are 26.8 ha of the TEC southern Swan Coastal Plain Ironstone Shrublands in Treeton, 4.7 ha of which are on formally reserved land, with the remaining 22.1 ha informally reserved. There are 91.4 ha of this TEC in the RFA area, 30 ha of which are on reserved land (33%). Formally reserving the 22.1 ha of the Ironstone Shrublands in Treeton would increase its reservation level by 24.2%.

[1] The Swan Coastal Plain vegetation ecosystem occurs on the boundary of the RFA area, with extensive areas beyond the RFA area. While this ecosystem was identified during the RFA process, no further analysis was undertaken.

Declared Rare and Priority Flora

Declared Rare Flora	Total no. populations in RFA area	No. populations on reserved land (% reserved)	No. populations in Treeton on unreserved land	% increase in reservation
Brachysema modestum[1]	2	0	1	50
Daviesia elongata subsp. *elongata*[1]	8	1 (12.5%)	4	50
Dryandra nivea subsp. *uliginosa*	12	2 (16.0%)	2	16
Dryandra squarrosa subsp. *argillacea*	9	0	1	11[2]

[1] This species is only found in RFA area.

[2] There are also two populations of this species in Treeton that occur on reserved land.

There are also three records of Priority Flora occurring in Treeton, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). Ecoscape's assessment did not determine if these records are all the same species, or if they reflect the occurrence of several Priority species in the block.

Threatened Fauna

There is one record of Chuditch occurring in Treeton. Chuditch are listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of these records are from gazetted reserved land.

Social Values and Community Attachment

Local community members raised reserving all areas east of Margaret River and west of Sues Road at the FMP forum held at Margaret River, 3 September 2001.

Witchcliffe

Witchcliffe is 1,460 ha in size, with 520 ha informally reserved. Witchcliffe is one of the "east of Margaret River, west of Sues Rd" group of blocks included in this assessment.

Area being assessed: 910 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	324	244	0.07
Jarrah Leeuwin	56,400	15.3	14.7	0.6	847	589	1.0
Jarrah Woodland	106,374	52.1	27.5	24.6	145	0	0
Karri West Coast	14,500	30.8	30.7	0.1	69	59	0.4
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	32	0	0
Swamps	15,300	42.8	40.0	2.8	4	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BK	21,361	63.6	51.6	12.0	10	4	0.02
C1	18,982	13.5	12.3	1.2	444	228	1.2
Cw1	6,144	10.1	9.8	0.3	24	6	0.1
T	27,829	11.3	8.8	2.5	311	226	0.8
Tw	8,723	8.0	4.5	3.5	72	42	0.5
W1	7,296	27.9	25.3	2.6	532	375	5.1
Ww1	2,268	23.3	19.6	3.7	41	15	0.7

Other Biodiversity Values

High biophysical naturalness

Level of reservation: 98% (88% formal)

Amount not reserved: 4 ha[1] Increase in reservation: <0.01%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 650 ha Increase in reservation: 0.3%

Threatened Fauna

There are two records of the White-bellied Frog (*Geocrinia alba*) occurring in Witchcliffe. The White-bellied Frog is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and as endangered by the IUCN. There are three records of the species occurring in the RFA area, and there are no records of the frog occurring from gazetted reserved land. However, a private property, south of Witchcliffe, containing the main habitat of the White-bellied Frog was purchased approximately a year ago and made a National Park.

Social Values and Community Attachment

Local community members raised reserving all areas east of Margaret River and west of Sues Road at the FMP forum held at Margaret River, 3 September 2001.

[1] These 4 ha may be an artifact of the grid system used by the Forest Management Information System.

3.3 Warren Region Forest Blocks

Boorara *2002 Harvest Plan*

Boorara is 5,970 ha in size, with 2,870 ha reserved. 1,800 ha are formally reserved. There are a further 520 ha of old growth forest in the part of Boorara currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting.

Area being assessed: 2,570 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	755	67	0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	41	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	4,623	2,502	1.3
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	542	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	1	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	581	82	0.2
COb	21,839	77.2	75.3	1.9	314	191	0.9
COd	2,118	36.2	27.6	8.6	9	0	0
CRb	52,753	38.6	29.7	8.9	2,972	1,713	3.2
CRy	33,764	33.9	24.6	9.3	203	12	0.04
Q	14,958	87.4	80.6	6.8	27	1	<0.01
S1	25,513	64.8	53.2	11.6	232	93	0.4
S3	6,226	73.1	62.1	11.0	310	126	2.0
V4	5,420	91.7	91.1	0.6	82	0	0
Vh2	9,968	58.4	44.1	14.3	559	156	1.6
Vh3	12,396	72.4	66.7	5.7	666	196	1.6

Other Biodiversity Values

High biophysical naturalness (2,515 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 60 ha Increase in reservation: <0.01%

Other

The Boorara area is on the Interim list of the Register of the National Estate for its natural values (Australian Heritage Commission Register of the National Estate database, searched March 2002).

Social Values and Community Attachment

The community protested about logging in Boorara in 2000.

The Boorara block contains the Boorara tree, a tall Karri once used as a fire tower (Meney and Brown, 1985). The tree is listed as being a place of Significant Community Heritage (The Training and Development Group, 1997). The tree, in conjunction with the Lane Poole Falls area, has been identified as an Indicative National Estate place of aesthetic value (Commonwealth and West Australian RFA Steering Committee, 1998d).

The WA Forest Alliance has recommended that part of Boorara, along with several other blocks, should be added to the Shannon National Park. It is unclear which part of Boorara the WA Forest Alliance is referring to and it may fall within the part of Boorara already proposed for reservation.

Boyndaminup *2002 Harvest Plan*

Boyndaminup is 6,200 ha in size, of which 5,060 ha are reserved. 4,710 ha are formally reserved. There are a further 80 ha of old growth forest in the part of Boyndaminup currently intended to remain as State forest available for multiple use which will be protected by exlcusion during timber harvesting operations.

Area being assessed: 1,060 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,433	1,054	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	466	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	1,296	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,021	601	0.8
BEy1	27,979	68.4	60.1	8.3	1,949	255	0.9
CB	6,137	46.2	33.2	13.0	45	0	0
CM	24,527	54.1	50.2	3.9	2,226	51	0.2
CO1	5,105	21.0	14.0	7.0	26	0	0
COy1	22,876	72.4	71.6	0.8	184	0	0
CP	3,943	77.2	60.1	17.1	255	117	3.0
QN	9,071	59.2	58.4	0.8	6	0	0
S1	25,513	64.8	53.2	11.6	202	19	0.07
S2	21,123	39.3	36.2	3.1	280	10	0.05

Other Biodiversity Values

Declared Rare and Priority Flora

One population of the Declared Rare species, *Caladenia harringtoniae* occurrs in Boyndaminup (currently protected by prescription). In total there are 40 populations of this species, 35% of which occur within the reserve system. Placing the population in Boyndaminup under formal reservation would increase this by 2.5%.

Social Values and Community Attachment

Based on the information collected for this assessment there appears to be no community attachment or social values associated with Boyndaminup.

Brockman *2002 Harvest Plan*

Brockman is 5,910 ha in size and 2,330 ha are reserved. 900 ha are formally reserved. There are 170 ha of old growth forest in the part of Brockman currently intended to remain State forest available for multiple use which will be protected by exclusion from timber harvesting operations.

Area being assessed: 3,400 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,471	937	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	45	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	4,214	2,422	1.3
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	113	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
CRb	52,753	38.6	29.7	8.9	2,306	1,599	3.0
CRd	1,904	45.9	39.6	6.3	13	2	0.1
CRy	33,764	33.9	24.6	9.3	513	398	1.2
CT	3,128	56.9	32.7	24.2	118	58	1.9
LF	20,578	44.1	19.6	24.5	1,309	303	1.5
PM1	25,801	23.5	8.6	14.9	1,241	893	3.5
V1	2,285	69.7	16.3	53.4	281	61	2.7
Vh2	9,968	58.4	44.1	14.3	19	16	0.2
WA	8,621	57.8	31.1	26.7	10	0	0
WH1	20,321	34.7	10.9	23.8	42	28	0.1

Other Biodiversity Values

High biophysical naturalness (463 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 7 ha[1] Increase in reservation: <0.01%

Threatened Fauna

There is one record of a Quokka (*Setonix brachyurus*) occurring in Brockman. The Quokka is listed as being rare or likely to become extinct. There are 126 records of Quokka occurring within the RFA area, four occur on gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 247 ha Increase in reservation: 0.05%

The Minister for the Environment has received five letters from the public about Brockman. In addition, the forum held during the development of the Forest Management Plan at Margaret River (3 September 2001) raised the issue of increasing the buffer zones around streams and rivers in Brockman.

WA Forest Alliance have stated that local landholders are concerned about plans to log forest adjacent to their properties (unverified, see Section 2.4).

The Bibbulmun track passes through Brockman. 200 m wide informal and formal reserves buffer the track on both sides.

Burnside

Burnside is 2,610 ha in size, with 630 ha reserved (210 ha of this are formally reserved). Burnside is included in this assessment to meet the requirement to assess the conservation values of the blocks linking the Shannon and Mt Frankland National parks. There are a further 50 ha of old growth forest in the part of Burnside currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 1,930 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,831	1,474	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	45	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	560	453	0.2
Rocky Outcrops	26,400	44.8	29.1	15.7	4	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	170	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	1	0	0
BEb	5,306	55.8	42.6	13.2	250	224	4.2
BEy1	27,979	68.4	60.1	8.3	490	409	1.5
CM	24,527	54.1	50.2	3.9	16	9	0.04
COb	21,839	77.2	75.3	1.9	74	74	0.3
COy1	22,876	72.4	71.6	0.8	45	45	0.2
CRb	52,753	38.6	29.7	8.9	6	1	<0.01
CRy	33,764	33.9	24.6	9.3	972	653	1.9
Kb	28,345	64.4	64.3	0.1	206	85	0.3
Mty1	20,426	91.1	90.9	0.2	214	203	1.0
Pi	13,827	95.9	95.0	0.9	4	1	<0.01
Q	14,958	87.4	80.6	6.8	0.5	0	0
S1	25,513	64.8	53.2	11.6	329	224	0.9
S3	6,226	73.1	62.1	11.0	2	0	0

Other Biodiversity Values

High biophysical naturalness (406 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 67 ha Increase in reservation: 0.01%

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 1 ha[2] Increase in reservation: <0.01%

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Participants of the FMP forum held in Perth, 11 September 2001 argued that blocks linking the Shannon National Park and Mt Frankland National Park had high conservation values.

Challar *2002 Harvest Plan*

Challar is 6,050 ha in size, with 1,980 ha reserved. 1,030 ha are formally reserved. There are a further 90 ha of old growth forest in the part of Challar currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 3,980 ha

[1] These 7 ha may be an artifact of the grid system used by FMIS.

[2] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,865	3,582	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	176	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	502	397	0.2
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	507	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BEb	5,306	55.8	42.6	13.2	575	498	9.4
BEy1	27,979	68.4	60.1	8.3	3,463	2,713	9.7
CM	24,527	54.1	50.2	3.9	753	115	0.5
QN	9,071	59.2	58.4	0.8	48	18	0.2
S1	25,513	64.8	53.2	11.6	435	210	0.8
S2	21,123	39.3	36.2	3.1	513	316	1.5
S3	6,226	73.1	62.1	11.0	263	109	1.8

Other Biodiversity Values

High biophysical naturalness (1,348 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 10 ha[1] Increase in reservation: <0.01%

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Declared Rare and Priority Flora

The Declared Rare species, *Caladenia harringtoniae*, has been found in Challar. Currently, there are 40 populations of this species in the study area (some occur outside the Regional Forest Agreement area), 35% are reserved. Reserving the population in Challar would increase the formal reservation of this species by 2.5%. The population in Challar is currently protected by the exclusion of timber harvesting operations.

Threatened Fauna

There is one record of a Chuditch (*Dasyurus geoffroii*) occurring in Challar. Chuditch are listed as being rare or likely to go extinct. There are 379 records of Chuditch within the RFA area, 17 of these occur on gazetted reserved land.

[1] These areas may be an artifact of the grid system used by the Forest Management Information System.

Corridors and Linkages

Challar has the potential to act as a corridor between two new proposed reserves in Boyndaminup and Poorginup (reserved as a result of the Government's "*Protecting our old-growth forest*" policy).

Social Values and Community Attachment

The Conservation Council of Western Australia has identified Challar as being of high conservation value and recommended reservation (Conservation Council, 1994).

Chitelup

Chitelup is 7,660 ha in size, of which 7,470 ha are reserved (7,430 ha are formally reserved). There are a further 20 ha of old growth forest in the part of Chitelup currently intended to remain State forest available for multiple purpose which will be protected by exclusion during timber harvesting operations.

Area being assessed: 170 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	6,205	173	0.03
Jarrah Unicup	81,000	20.0	20.0	0.0	436	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	347	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	2	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	642	0	0
Swamps	15,300	42.8	40.0	2.8	26	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BEy1	27,979	68.4	60.1	8.3	448	91	0.3
BEy2	78,308	15.4	15.3	0.1	3,800	0	0
CA	59,511	96.9	96.9	0	0.5	0	0
CM	24,527	54.1	50.2	3.9	435	9	0.04
COy2	2,534	80.8	80.8	0	25	0	0
FH5	21,444	19.0	19.0	0	451	0	0
QN	9,071	59.2	58.4	0.8	204	14	0.2
S2	21,123	39.3	36.2	3.1	1,265	58	0.3
S3	6,226	73.1	62.1	11.0	14	0	0
t	5,253	33.7	33.7	0	278	0	0
UC2	3,207	72.6	72.6	0	16	0	0
UC3	3,669	19.7	19.7	0	168	0	0
V4	5,420	91.7	91.1	0.6	23	0	0
Va2	11,006	46.9	46.9	0	442	0	0
Va3	5,468	56.5	56.5	0	88	0	0

Other Biodiversity Values

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 83 ha Increase in reservation: 0.04%

Threatened Fauna

There is one record of the Western Brush Wallaby occurring in Chitelup. The Wallaby is a Priority Four species (not covered by legislation) and there are 99 records of Wallaby occurring in the RFA area. There are no records from land that is currently reserved.

Social Values and Community Attachment

Biodiversity comments

In 1998 the WA Forest Alliance proposed that all of Chitelup be reserved, along with many blocks, to form the Walpole Wilderness Reserve (which adjoins Shannon National Park, Mt Frankland National Park, Mt Roe Reserve, and Perup Nature Reserve). The WAFA listed a large number of biodiversity values that they stated this group contained. As much of Chitelup is now formally reserved, many of these values are now protected.

Cleave

Cleave is 3,470 ha in size, with 1,830 ha reserved (110 ha formally reserved). There are a further 330 ha of old growth forest in the part of Cleave currently intended to remain State forest available for multiple purpose which will be protected by exclusion during timber harvesting operations.

Area being assessed: 1,310 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	1,226	434	0.1
Jarrah South	557,300	47.2	41.0	6.2	1,266	864	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	187	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	20	5	<0.01
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	760	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Ba	1,469	54.8	1.8	53.0	247	19	1.3
BE1	76,781	16.8	9.2	7.6	600	468	0.6
BR	11,215	0.7	0.7	0	0.5	0	0
CE	24,295	46.2	25.7	20.5	848	123	0.5
CV	2,038	64.1	63.2	0.9	7	0	0
JA	1,528	91.1	84.4	6.7	72	6	0.4
JN	4,692	59.5	43.3	16.2	89	18	0.4
KI	102,240	33.7	26.4	7.3	716	260	0.3
LF	20,578	44.1	19.6	24.5	128	46	0.2
Sc	3,147	4.3	3.2	1.1	44	6	0.2
Sd	37,717	32.8	26.3	6.5	150	6	0.02
Swd	10,382	57.3	52.2	5.1	43	18	0.2
WH1	20,321	34.7	10.9	23.8	93	30	0.1
WS2	3,332	35.5	28.7	6.8	365	290	8.7
YN1	23,494	35.5	14.4	21.1	70	16	0.07

Other Biodiversity Values

High biophysical naturalness (1,503 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 3 ha[1] Increase in reservation: <0.01%

High concentration of disjunct flora

Level of reservation: 56% (51% formal)

Amount not reserved: 2 ha[1] Increase in reservation: <0.01%

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 32 ha Increase in reservation: 0.02%

High probability of flora species richness

Level of reservation: 75% (69% formal)

Amount not reserved: 4 ha[1] Increase in reservation: <0.01%

Area of high flora endemism

Level of reservation: 64% (60% formal)

Amount not reserved: 118 ha Increase in reservation: 0.05%

Corridors and Linkages

Cleave, along with Central, Storry and Bidella could act as a corridor between reserves to the west and east proposed as a conseqeunce of the Government's "*Protecting our old growth forests*" policy. Informal reserves in these blocks already accomplish this to a large degree.

[1] These areas may be an artefact of the grid system used by the Forest Management Information System.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 38 ha Increase in reservation: 0.01%

The Minister for the Environment and Heritage received one letter between February 2001 and October 2001 about Cleave.

The WA Forest Alliance sent a letter (12 December 2001) to the Minister for the Environment and Heritage which stated the WAFA's belief that logging in Cleave would occur adjacent to the D'Entrecasteaux National Park.

Collins

Collins is 4,470 ha in size, of which 1,220 ha are informally reserved. There are a further 20 ha of old growth forest in the part of Collins currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 3,220 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,437	1,128	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	24	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	2,894	2,063	1.1
Peppermint & Coastal Heath	80,100	72.5	72.3	0.2	0.5	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	82	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
CRb	52,753	38.6	29.7	8.9	1,377	1,161	2.2
CRd	1,904	45.9	39.6	6.3	140	121	6.4
CRy	33,764	33.9	24.6	9.3	775	620	1.8
CT	3,128	56.9	32.7	24.2	55	29	0.9
LF	20,578	44.1	19.6	24.5	575	343	1.7
PM1	25,801	23.5	8.6	14.9	917	687	2.7
V1	2,285	69.7	16.3	53.4	272	49	2.1
WA	8,621	57.8	31.1	26.7	326	182	2.1

Other Biodiversity Values

High biophysical naturalness (187 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 13 ha Increase in reservation: <0.01%

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 53 ha Increase in reservation: 0.01%

Between February 2001 and October 2001, the Minister for the Environment and Heritage received two letters about Collins.

The WA Forest Alliance sent a letter (12 December 2001) to the Minister for the Environment and Heritage which stated the WAFA's belief that logging in Collins would degrade its aquatic ecosystems and affect its tourism values.

Corbal

Corbal is 4,720 ha in size, with 3,910 ha reserved (3,760 ha are formally reserved).
Area being assessed: 810 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3920	782	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	125	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	233	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	438	27	0.01
Wandoo Woodland	163,000	23.8	19.0	4.8	3	3	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	1,218	46	0.1
CB	6,137	46.2	33.2	13.0	432	175	2.9
CC2	13,054	54.0	50.6	3.4	572	0	0
CL2	26,357	52.3	47.0	5.3	1,315	395	1.5
CO2	3,813	33.1	30.6	2.5	239	90	2.4
MT2	3,104	24.7	17.9	6.8	107	88	2.8
WH3	4,766	36.5	26.9	9.6	12	12	0.3
YE	8,623	39.9	36.5	3.4	393	0	0
YEf	1,029	48.8	48.8	0	7	0	0
YR	19,259	29.3	13.5	15.8	424	5	0.03

Other Biodiversity Values

Declared Rare and Priority Flora

There is one record of a Priority Flora occurring in Corbal, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). This Priority species may occur on reserved land (based on a visual comparison of maps).

Threatened Fauna

Species	Status	No. records in Corbal	No. records in RFA area	No. records from reserved land
Chuditch	Rare or likely to become extinct & vulnerable	1	379	17
Red-tailed Black Cockatoo	Priority Three	1	177	5
Numbat	Rare or likely to become extinct & vulnerable	5	140	3
Woylie	Priority Four & conservation dependent	11	110	3

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Corbal, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest and for creating the Greater Kingston Forest Park. The Friends and WAFA argue (based on information supplied by Dr. Jean-Paul Orsini and not verified, see Section 2.4) that the Greater Kingston area is "one of the three most important areas for the conservation of endangered species in the South-West of WA". The campaigns by Friends of GKF and WAFA have included press releases, submissions to Government, setting up information stalls and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk on the values of old growth forest. Over this period there was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries, which includes the Greater Kingston Forest. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage value.

In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c.* 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Friends of GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (not verified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of very high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believe should be included in the National Park, but are not currently proposed for reservation, are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Kingston part of 4 & 5, all 6 & 7; Corbal 1 and adjacent areas. The values present in Corbal 1 according to the Friends of GKF are: old growth forest with no evidence of prior logging; abundant wildlife and provision of endangered species habitat; and high biodiversity (unverified, see Section 2.4). The Group is also concerned about the possibility that timber harvesting would introduce dieback into areas of high biodiversity and they argue that Corbal has greater economic value as an ecotourism and biodiversity reserve as the block has little millable timber.

Biodiversity comments
A submission by Dr. Jean-Paul Orsini suggests that the Priority Species *Grevillea cirsiifolia* occurs in Corbal.

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Court *2002 Harvest Plan*

Court is 2,800 ha in size. Of this, 750 ha are reserved, 310 ha are reserved formally. There are a further 280 ha of old growth forest in the part of Challar currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.
Area being assessed: 1,760 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	788	307	0.06
Jarrah Woodland	106,374	52.1	27.5	24.6	24	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	1881	1441	0.7
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	94	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	69	4	0.01
BE1	76,781	16.8	9.2	7.6	227	96	0.1
CRb	52,753	38.6	29.7	8.9	522	399	0.8
CRy	33,764	33.9	24.6	9.3	457	344	1.0
PM1	25,801	23.5	8.6	14.9	992	629	2.4
Q	14,958	87.4	80.6	6.8	114	23	0.2
WH1	20,321	34.7	10.9	23.8	341	200	1.0
YN1	23,494	35.5	14.4	21.1	66	53	0.2

Other Biodiversity Values

High biophysical naturalness (675 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 32 ha Increase in reservation: <0.01%

Social Values and Community Attachment

There appears to be no social values associated with, or community attachment, to Court.

Crowea *2002 Harvest Plan*

Crowea is 7,340 ha in size, of which 3,190 ha are reserved. 1,470 ha are formally reserved. There are a further 210 ha of old growth forest in the part of Crowea currently intended to remain State forest available for multiple use which will be protected by exclusion during timber harvesting operations.

Area being assessed: 3,940 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,839	909	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	17	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	5,166	3,003	1.6
Peppermint & Coastal Heath	80,100	72.5	72.3	0.2	5	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	264	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	236	1	<0.01
CRb	52,753	38.6	29.7	8.9	1217	693	1.3
CRy	33,764	33.9	24.6	9.3	2,827	1,982	5.9
Q	14,958	87.4	80.6	6.8	97	0	0
S1	25,513	64.8	53.2	11.6	832	366	1.4
V1	2,285	69.7	16.3	53.4	975	335	14.7
Vh2	9,968	58.4	44.1	14.3	806	501	5.0
Vh3	12,396	72.4	66.7	5.7	159	0	0
WA	8,621	57.8	31.1	26.7	81	22	0.3
WH1	20,321	34.7	10.9	23.8	61	13	0.1

Other Biodiversity Values

High biophysical naturalness (1,885 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 13 ha Increase in reservation: <0.01%

Threatened Fauna

There are nine records of Quokka (*Setonix brachyurus*) occurring in Crowea. Quokka is listed as a rare or likely to become extinct species. There are 126 records of Quokka occurring in the RFA area, four occur on land that has been reserved.

Crowea block has been identified as an Interim National Estate place for its natural values (Commonwealth and Western Australian RFA Steering Committee, 1998d; Australian Heritage Commission Register of the National Estate database, searched March 2002).

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 463 ha Increase in reservation: 0.09%

Crowea was the subject of extensive negotiations between the local community, the timber industry and CLM in the early 1990s. A committee was formed to discuss the possibility of reserving Crowea; an agreement was reached and the recommendation to reserve all of Crowea block, because of its cultural, heritage and natural values was made to Government. This recommendation was rejected and the committee subsequently disbanded. Local community members now see direct action as the only way to communicate their interest in and attachment to, Crowea.

One letter has been sent to the Minister for the Environment about Crowea in the past year.

The WA Forest Alliance has indicated that part of Crowea should be added to the Shannon National Park, although it is unclear which part they intend for reservation. In addition, the WA Forest Alliance has been in correspondence with the government about Crowea since

the early 1990s. Crowea has been the focus of strong community protests since the early 1990s.

There is a registered Aboriginal site (# 4570) in Crowea (Forest Products Commission, 2001).

The Bibbulmun track passes through Crowea. 200 m wide informal and formal reserves buffer the track on both sides.

Dombakup *2002 Harvest Plan*

Dombakup is 8,970 ha in size. 4,310 ha of Dombakup is reserved, 2,530 ha of which is formally reserved. There are a further 610 ha of old growth forest in the part of Dombakup currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.
Area being assessed: 3,940 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,737	346	0.06
Jarrah Woodland	106,374	52.1	27.5	24.6	162	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	6,476	3,562	1.8
Peppermint & Coastal Heath	80,100	72.5	72.3	0.2	78	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	472	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	855	158	0.4
BWp	32,542	81.0	81.0	0	66	2	0.01
COy1	22,876	72.4	71.6	0.8	75	36	0.2
CRb	52,753	38.6	29.7	8.9	1,762	1,190	2.3
CRy	33,764	33.9	24.6	9.3	1,487	877	2.6
HK	3,394	79.2	77.6	1.6	359	55	1.6
JA	1,528	91.1	84.4	6.7	44	0	0
LF	20,578	44.1	19.6	24.5	708	288	1.4
PM1	25,801	23.5	8.6	14.9	459	301	1.2
Q	14,958	87.4	80.6	6.8	395	49	0.3
S1	25,513	64.8	53.2	11.6	447	110	0.4
V1	2,285	69.7	16.3	53.4	142	17	0.7
Vh2	9,968	58.4	44.1	14.3	1,218	470	4.7
WA	8,621	57.8	31.1	26.7	6	3	0.03
WH1	20,321	34.7	10.9	23.8	336	137	0.7
YN1	23,494	35.5	14.4	21.1	456	215	0.9

Other Biodiversity Values

High biophysical naturalness (3,937 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 117 ha Increase in reservation: 0.02%

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 40 ha Increase in reservation: 0.01%

WA Forest Alliance has recommended that part of Dombakup be incorporated into the Shannon National Park. The newly reserved part of Dombakup (as a consequence of the Governments "*Protecting our old growth forests*" policy) may meet this recommendation. Various conservation groups, under the umbrella of the Australian Conservation Foundation, recommended that Dombakup become a Nature Reserve in 1987 (Australian Conservation Foundation, 1987).

Several letters have been sent to the Minister for the Environment and the Director of CLM by the WA Forest Alliance regarding Dombakup over the past three years.

An archaeological survey of Dombakup coupe 24 in 1998 found many Aboriginal artefacts within the Karri forest in the coupe, providing unique evidence of Aboriginal use of Karri forests. The results of this survey and a long process of negotiation between the Aboriginal community and CLM has lead to coupe 24 being proposed for reservation to protect these values. However, information provided by Glen Kelly (WA Aboriginal Native Title Working Group) indicates that the proposed reserve covers only the *c*. 65% of the site. Reserving another 20 ha, as suggested by Glen Kelly, would increase the area of the site reserved to *c*. 75-80%.

There appears to have been no subsequent surveys for Aboriginal artefacts in the remainder of the unreserved part of Dombakup.

Dudijup

Dudijup is 2,960 ha in size, with 440 ha reserved (200 ha are formally reserved).
Area being assessed: 2,520 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	2,887	2,518	0.5
Rocky Outcrops	26,400	44.8	29.1	15.7	4	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	72	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	1,200	1,106	2.4
CL2	26,357	52.3	47.0	5.3	574	509	1.9
CO2	3,813	33.1	30.6	2.5	32	32	0.8
YN2	6,744	25.0	1.3	23.7	621	417	6.2
YR	19,259	29.3	13.5	15.8	537	455	2.4

Other Biodiversity Values

Declared Rare and Priority Flora

Two Declared Rare species of *Caladenia*, *C. harringtoniae* (one population) and *C. christineae* (two populations) occur in Dudijup. There are 40 populations of *C. harringtoniae* in the RFA area, 14 populations occur on reserved land (35% reservation level). There are 26 populations of *C. christineae* in the RFA area, five on which occur on reserved land (19.2% reservation level). Both populations in Dudijup are protected through the exclusion of operations during timber harvesting. Formally reserving the population of *C. harringtoniae* will increase the reservation level of this species by 2.5% and formally reserving the two populations of *C. christineae* will increase its reservation level by 7.7%.

Threatened Fauna

There are records of seven Threatened Fauna occurring in Dudijup.

Species	Status	No. records in Dudijup	No. records in RFA area	No. records from reserved land
Brush-tailed Phascogale	Priority Three	1	84	1
Chuditch	Rare or likely to become extinct & vulnerable	2	379	17
Red-tailed Black Cockatoo	Priority Three	3	177	5
Numbat	Rare or likely to become extinct & vulnerable	2	140	3
Quenda	Priority Four & conservation dependent	1	162	3
Tammar Wallaby	Priority Four & conservation dependent	1	26	0
Western Ringtail Possum	Rare or likely to become extinct & vulnerable	2	63	2

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Dudijup, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. The Friends and WAFA argue (based on information supplied by Dr. Jean-Paul Orsini, but not verified, see Section 2.4) that the Greater Kingston area is “one of the three most important areas for the conservation of endangered species in the South-West of WA”. The campaigns by Friends of GKF and WAFA have included press releases, submissions to

Government, setting up information stalls, and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk on the values of old growth forest. Over this period there was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage value.

In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c*. 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Friends for GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (unverified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believe should be included in the National Park, but are not currently proposed for reservation, are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Kingston part of 4 & 5, all 6 & 7; Corbal 1 and adjacent areas. The conservation values that the Friends argue belong to these compartments (except Corbal 1) are: old growth forest (here selectively logged only once prior to 1970); structural diversity providing a wide range of endangered species habitats; forest type of higher rainfall part of area which is not well represented in the proposed National Park; heritage; corridor linkages; a large area of unfragmented Jarrah forest (rare); and easy accessibility to Bridgetown and Manjimup and greater potential for tourism activity (unverified, see Section 2.4). These areas (except for Corbal 1) are included in the area registered by the National Trust as having high heritage values as natural and cultural landscapes.

Biodiversity comments

Information provided by Jean-Paul Orsini indicates that the Priority Species *Grevillea cirsiifolia* is present in Dudijup (unverified, see Section 2.4).

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Dwalgan

Dwalgan is 4,650 ha in size, of which 4,640 ha are formally reserved.

Area being assessed: 10 ha. These 10 ha have been cleared and are now planted in exotics.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	71	0	0
Jarrah South	557,300	47.2	41.0	6.2	3,765	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	64	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	18	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	662	0	0
Wandoo Woodland	163,000	23.8	19.0	4.8	56	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	1,249	0	0
BE3	13,135	80.7	80.6	0.1	1,490	0	0
CB	6,137	46.2	33.2	13.0	195	0	0
CC2	13,054	54.0	50.6	3.4	480	0	0
CL2	26,357	52.3	47.0	5.3	675	0	0
CO2	3,813	33.1	30.6	2.5	163	0	0
DM2	41,469	7.0	7.0	0	76	0	0
NW2	16,837	12.1	11.7	0.4	79	0	0
NWf2	7,380	5.6	5.2	0.4	1	0	0
YE	8,623	39.9	36.5	3.4	227	0	0
YEf	1,029	48.8	48.8	0	2	0	0

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Dwalgan.

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Dwalgan, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. As all of Dwalgan (except for 10 ha of exotic forest) is now reserved, the social values of Dwalgan are protected.

Easter

Easter is 4,000 ha in size, 1,550 ha are reserved (1,010 ha are in formal reserves). There are a further 20 ha of old growth forest in the part of Easter currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,440 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Darling Scarp	29,000	7.8	7.6	0.2	146	0	0
Jarrah Blackwood	347,200	31.2	23.9	7.3	111	31	0.01
Jarrah South	557,300	47.2	41.0	6.2	3,178	2,160	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	13	0	0
Karri Main belt	193,000	48.2	36.2	12.0	532	243	0.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	10	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	37	32	0.08
BE1	76,781	16.8	9.2	7.6	1,686	1,367	1.8
CRb	52,753	38.6	29.7	8.9	24	3	0.01
CRd	1,904	45.9	39.6	6.3	14	14	0.7
DS	29,108	7.8	7.6	0.2	146	0	0
LF	20,578	44.1	19.6	24.5	562	240	1.2
PM1	25,801	23.5	8.6	14.9	289	229	0.9
WA	8,621	57.8	31.1	26.7	990	402	4.7
WH1	20,321	34.7	10.9	23.8	10	9	0.04
WS2	3,332	35.5	28.7	6.8	113	31	0.9
YN1	23,494	35.5	14.4	21.1	119	106	0.5

Other Biodiversity Values

Threatened Fauna

There are records of four Threatened Fauna occurring in Easter.

Species	Status	No. records in Easter	No. records in RFA area	No. records from reserved land
Baudin's Cockatoo	Rare or likely to become extinct & vulnerable	1	84	1
Red-tailed Black Cockatoo	Priority Three	2	177	5
Quenda	Priority Four & conservation dependent	1	162	3
Woylie[1]	Priority Four & conservation dependent	14	100	3

[1] Woylie were translocated to Easter as part of the Western Shield programme.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 19 ha Increase in reservation: <0.01%

As part of the RFA, the State Government announced a competition for proposals to develop major tourist attractions in the South-West. In response to this call, two local community members put together a proposal in 2000 to make Easter block a 'tourism icon'. This proposal consisted of a four-point plan:

1. Re-develop the Dickson Fire Tower, which has historical and cultural value, to allow visitors to experience the fire spotters "eagle nest". If re-development is not possible, the plan proposes building a new tower which would allow views into the spotters cabin. Either tower would allow "spectacular" views over the forest. Additional amenities (e.g. toilets, walk trails, picnic sites and BBQ's) were included in the plan. The proposal emphasised the closeness of the tower to the Vasse Highway and its high accessibility to visitors. The submitted proposal included a concept plan of the re-development and a break down of the estimated costs involved.
2. Develop picnic spots and walk trails along the Dickson Tower Road, along which the proposal argues there are "spectacular tall Jarrah, Marri and Blackbutt trees". Along the left hand side of the road there is a virgin Jarrah reserve (already reserved), into which *c.* 40 Woylies have been released (Autumn 1998); in June 1999, 35 Woylies were trapped, including 10 females with young in their pouches. The proposal mentions the possibility of wild life spotting tours along the road because of this release program. Further along Dickson Tower Road there is, according to the proposal, the largest belt of virgin Karri forest in the Nannup shire.
3. Develop picnic sites and walk trails along the Easter Road (eastern block boundary) which would provide views over the Karri forest.
4. Develop a tourist drive along Sputnik Road, which connects with Dickson Tower Road. The proposal states the forests along Sputnik Road contain "excellent stands of virgin Karri forest, as well as beautiful valleys and hillsides with mixed forest". Again the potential for picnic sites, camping spots, walk trails and lookouts along the drive exists. The proposal recognises that Sputnik Road is within a Disease Risk Area, which would require CLM to assess the impact of visitor use. The proposal suggests that limiting access to the road to summer or constructing a sealed road could reduce the risk of disease spread.

(Various values mentioned in this plan have not been verified, see Section 2.4).

The plan was endorsed by the Management Board of the Nannup Tourist Information Centre and the CEO of the Shire of Nannup in letters (9 March 2000 and 8 March 2000, respectively) to the competition judges. Both letters felt that the proposal would increase visitor numbers to the area, which would have a positive economic impact. Both letters also stated that Easter block was easily accessible by daytrippers from most centres, including Perth. The plan was also endorsed by Dr. Christine Sharp (MLC for South-West region for the Greens) in a letter (10 August 2000) to the Minister for the Environment and Heritage. This letter emphasised the "paucity of tourism sites in the Nannup district".

The competition was judged in May 2000 and the Easter block 'tourism icon' proposal was nominated for a special merit award.

The Friends of the Blackwood Valley was formed *c.* 10 years ago over concerns about helicopter spraying in the valley. The group now campaigns against logging in Easter, Helms, Barrabup, Hilga and has an interest in Iffley and Lewin.

Local community members argued for increasing the buffers around streams and rivers in Easter at the Margaret River FMP forum, held 3 September 2001.

Although there is now a proposed Easter National Park and local community members appreciate this proposal, the Friends of the Blackwood Valley believes the proposed reserve is too small and needs to be expanded by *c*. 60%.

Biodiversity comments

The proposal to make Easter a 'tourism icon' argued that Easter has stands of virgin and re-growth Karri, Marri, Jarrah, Blackbutt, Bullich, Peppermint and other tree species (including the rare Pink Flowering Marri). The proposal also states that Easter has a varied terrain, with deep valleys and steep hillsides (unverified, see Section 2.4).

Flybrook

Flybrook is 5,500 ha in size, of which 2,610 ha are reserved (1,600 ha are formally reserved). There are a further 320 ha of old growth forest in the part of Flybrook currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,580 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah Blackwood	347,200	31.2	23.9	7.3	72	0	0
Jarrah South	557,300	47.2	41.0	6.2	3,910	1,868	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	320	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	925	699	0.4
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	262	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	259	93	0.2
Ba	1,469	54.9	1.8	53.1	1	0	0
BE1	76,781	16.8	9.2	7.6	978	644	0.8
CE	24,295	46.2	25.7	20.5	255	21	0.09
CRb	52,753	38.6	29.7	8.9	219	116	0.2
CRd	1,904	45.9	39.6	6.3	92	76	4.0
CRy	33,764	33.9	24.6	9.3	150	122	0.4
HK	3,394	79.2	77.6	1.6	262	73	2.2
JA	1,528	91.1	84.4	6.7	38	0	0
LF	20,578	44.1	19.6	24.5	278	26	0.1
PM1	25,801	23.5	8.6	14.9	472	342	1.3
Q	14,958	87.4	80.6	6.8	545	226	1.5
Sc	3,147	4.3	3.2	1.1	71	62	2.0
Sd	37,717	32.8	26.3	6.5	92	0	0
Sd2	101	85.1	85.1	0	3	0	0
WH1	20,321	34.7	10.9	23.8	1,003	518	2.5
WS2	3,332	35.5	28.7	6.8	303	7	0.2
YN1	23,494	35.5	14.4	21.1	469	241	1.0

Other Biodiversity Values

High biophysical naturalness (1,960 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 5 ha[1] Increase in reservation: <0.01%

Threatened Fauna

There is one record of Western False Pipistrelle (*Falsistrellus mackenziei*) occurring in Flybrook. The Pipistrelle is a Priority Three species (not covered by legislation). There are 36 records of the Pipistrelle occurring in the RFA area, 11 of those records are from gazetted reserved land.

Social Values and Community Attachment

Flybrook was the subject of a meeting between stakeholders and Government Ministers. No further information is available.

Gobblecannup *2002 Harvest Plan*

Gobblecannup is 2,770 ha in size and 2,340 ha are reserved. 2,270 ha are formally reserved.

Area being assessed: 420 ha

[1] These 5 ha may be an artifact of the grid system used by the Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	2,057	422	0.08
Jarrah Woodland	106,374	52.1	27.5	24.6	75	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	197	2	<0.01
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	440	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	771	261	0.3
BEb	5,306	55.8	42.6	13.2	20	0	0
BEy1	27,979	68.4	60.1	8.3	313	0	0
CL1	15,179	22.1	9.9	12.2	33	30	0.2
CM	24,527	54.1	50.2	3.9	663	0	0
CO1	5,105	21.0	14.0	7.0	71	15	0.3
CP	3,943	77.2	60.1	17.1	809	104	2.6
QN	9,071	59.2	58.4	0.8	35	0	0
YN1	23,494	35.5	14.4	21.1	26	0	0
YN2	6,744	25.0	1.3	23.7	30	14	0.2

Other Biodiversity Values

Threatened Fauna

There is one record of a Chuditch occurring in Gobblecannup. Chuditch is listed as being rare or likely to go extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch within the RFA area, 17 of these occur on gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 2 ha[1] Increase in reservation: <0.01%

Graphite *2002 Harvest Plan*

Graphite is 3,260 ha in size of which 950 ha are reserved, all of it informally reserved. There are a further 180 ha of old growth forest in the part of Graphite currently intended to remain State forest available for multiple use which will be protected through exclusion during timber harvesting operations.

Area being assessed: 2,130 ha

[1] These 2 ha may be an artifact of the grid system used by the Forest Management Information System.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,179	1,017	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	28	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	1,956	1,081	0.6
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	54	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	21	1	<0.01
BE1	76,781	16.8	9.2	7.6	672	615	0.8
CRb	52,753	38.6	29.7	8.9	324	216	0.4
CRy	33,764	33.9	24.6	9.3	546	473	1.4
DO	2,288	90.3	78.5	11.8	139	74	3.2
LF	20,578	44.1	19.6	24.5	229	124	0.6
PM1	25,801	23.5	8.6	14.9	49	40	0.2
Q	14,958	87.4	80.6	6.8	73	27	0.2
WA	8,621	57.8	31.1	26.7	531	138	1.6
WH1	20,321	34.7	10.9	23.8	345	205	1.0
YN1	23,494	35.5	14.4	21.1	287	185	0.8

Other Biodiversity Values

Threatened Fauna

There are two records of Quokka occurring in Graphite. Quokka are listed as being rare or likely to become extinct. There are 126 records of occurrence for Quokka in the RFA area, four of these occurred on gazetted reserved land that.

There is one record of a Water Rat (Rakali, *Hydromys chrysogaster*) occurring in Graphite. Water Rats are a Priority 4 species (not covered by legislation) and there are seven records of their occurrence in the RFA area, none of which occurred on gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 221 ha Increase in reservation: 0.04%

Gray *2002 Harvest Plan*

Gray is 3,650 ha in size of which 1,580 ha are reserved. Of this, 930 ha are formally reserved. There are a further 190 ha of old growth forest in the part of Gray currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 1,890 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	903	522	0.1
Jarrah Woodland	106,374	52.1	27.5	24.6	43	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	2,520	1,334	0.7
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	136	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	44	0	0
BE1	76,781	16.8	9.2	7.6	222	147	0.2
CRb	52,753	38.6	29.7	8.9	901	739	1.4
CRd	1,904	45.9	39.6	6.3	61	50	2.6
CRy	33,764	33.9	24.6	9.3	165	122	0.4
DO	2,288	90.3	78.5	11.8	533	59	2.6
LF	20,578	44.1	19.6	24.5	325	123	0.6
Q	14,958	87.4	80.6	6.8	196	33	0.2
WA	8,621	57.8	31.1	26.7	379	114	1.3
WH1	20,321	34.7	10.9	23.8	552	295	1.5
YN1	23,494	35.5	14.4	21.1	224	173	0.7

Other Biodiversity Values

Centre of fauna endemism

Level of reservation: 85% (80% formal)

Amount not reserved: 14 ha Increase in reservation: 0.4%

Threatened Fauna

There is one record of a Quokka occurring in Gray. Quokka are listed as being rare or likely to become extinct and are considered vulnerable by the IUCN. There are 126 records of Quokka occurring in the RFA area, four of which occur on gazetted reserved land.

There is one record of a Baudin's Cockatoo (*Calyptorhynchus baudinii*) occurring in Gray. Baudin's Cockatoo is listed as being rare or likely to become extinct and is considered vulnerable by the IUCN. There are 28 records of Baudin's Cockatoo occurring in the RFA area, two of which occur on reserved land. A submission from Leonie van der Maesen indicates that she saw 4 cockatoos in a recent trip to Gray.

Corridors and Linkages

Part of Gray has the potential to act as a corridor between two reserves proposed as a consequence of the Government's "*Protecting our old growth forests*" policy.

Social Value and Community Attachment

The Bibbulmun track passes through Gray. 200 m wide informal reserves buffer the track on both sides.

Iffley *2002 Harvest Plan*

Iffley is 5,470 ha in size of which 2,010 ha is in reserve. 1,210 ha are formally reserved. There are a further 90 ha of old growth forest in the State forest of Iffley that has been informally reserved and set aside from timber harvesting.

Area being assessed: 3,360 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,687	2,204	0.4
Jarrah Blackwood	347,200	31.2	23.9	7.3	334	156	0.05
Jarrah Woodland	106,374	52.1	27.5	24.6	80	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	1,231	1,001	0.5
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	131	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	36	33	0.1
BD	47,785	46.8	28.4	18.4	53	15	0.03
BE1	76,781	16.8	9.2	7.6	1,524	1,081	1.4
CE	24,295	46.2	25.7	20.5	47	17	0.1
CRb	52,753	38.6	29.7	8.9	168	156	0.3
CRd	1,904	45.9	39.6	6.3	39	39	2.0
CRy	33,764	33.9	24.6	9.3	66	26	0.1
DS	29,108	7.8	7.6	0.2	9	0	0
GA	1,122	17.6	11.6	6.0	1	0	0
KI	102,240	33.7	26.4	7.3	244	131	0.1
LF	20,578	44.1	19.6	24.5	1,133	585	2.8
Q	14,958	87.4	80.6	6.8	331	137	0.9
WA	8,621	57.8	31.1	26.7	737	419	4.9
WH1	20,321	34.7	10.9	23.8	376	294	1.4
WS2	3,332	35.5	28.7	6.8	247	164	4.9
YN1	23,494	35.5	14.4	21.1	453	265	1.1

Other Biodiversity Values

High biophysical naturalness (845 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 2 ha[1] Increase in reservation: <0.01%

[1] These 2 ha may be an artifact of the grid system used by the Forest Management Information System.

Declared Rare and Priority Flora

The Declared Rare species, *Caladenia harringtoniae*, has been recorded from Iffley. Currently, there are 40 populations of this species remaining (some of which are found outside the Regional Forest Agreement area), 35% of which are within the reserve system. Placing the population in Iffley under reservation would increase this by 2.5%. The population is protected through the exclusion of operations during timber harvesting.

Threatened Fauna

There is one record of each of the following fauna species occurring in Iffley:

Baudin's Cockatoo (listed as being rare or likely to go extinct),
Brush-tailed Phascogale (Priority Three species),
Quenda (Priority Four species and considered dependent on conservation by the IUCN), and
Red-tailed Black Cockatoo (Priority Three species).

There are 28 records of Baudin's Cockatoo occurring in the RFA area, two of which occur on gazetted reserved land. There are 84 records of Brush-tailed Phascogale occurring in the RFA area, one of which occurred on gazetted reserved land. There are 162 records of Quenda occurring in the RFA area, three of which occur on gazetted reserved land. There are 177 records of Red-tailed Black Cockatoo occurring in the RFA area, five of which occur on gazetted reserved land.

Social Value and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	14 ha	Increase in reservation:	<0.01%

In 1976, scientific study was the management priority for Iffley (Forests Department, 1977a). At the time the Department was conducting a long-term study into the spread of dieback disease.

A local community group, Friends of the Blackwood Valley, was formed *c.* 10 years ago in response to local concerns about helicopter weed spraying in the Blackwood Valley. Since then the group has moved into other conservation areas, including campaigning for the Easter National Park. The group has informally expressed (during a phone conversation with Alison Cassanet) its attachment to Iffley, which is used by locals and tourists as a picnic and camping site. There are also many walking trails in Iffley that are used by community members. The group has not made any formal submissions about Iffley.

Kingston

Kingston is 5,910 ha in size, of which 1,660 ha reserved (1,220 ha are formally reserved).
Area being assessed: 4,250 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	5,444	4,168	0.8
Jarrah Woodland	106,374	52.1	27.5	24.6	66	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	279	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	117	74	0.02
Wandoo Woodland	163,000	23.8	19.0	4.8	5	4	<0.01

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	2,376	2,203	4.8
CB	6,137	46.2	33.2	13.0	527	320	5.2
CC2	13,054	54.0	50.6	3.4	439	367	2.8
CL2	26,357	52.3	47.0	5.3	814	438	1.7
CO2	3,813	33.1	30.6	2.5	288	121	3.2
MT2	3,104	24.7	17.9	6.8	76	76	2.4
WH3	4,766	36.5	26.9	9.6	967	709	14.9
YR	19,259	29.3	13.5	15.8	422	12	0.06

Other Biodiversity Values

Threatened Fauna

There are records of eight Threatened Fauna occurring in Kingston.

Species	Status	No. records in Kingston	No. records in RFA area	No. records from reserved land
Brush-tailed Phascogale	Priority Three	3	84	1
Chuditch	Rare or likely to become extinct & vulnerable	3	379	17
Red-tailed Black Cockatoo	Priority Three	3	177	5
Numbat	Rare or likely to become extinct & vulnerable	21	140	3
Quenda	Priority Four & conservation dependent	4	162	3
Western Brush Wallaby	Priority Four & conservation dependent	5	99	0
Western Ringtail Possum	Rare or likely to become extinct & vulnerable	7	63	2
Woylie	Priority Four & conservation dependent	10	110	3

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Kingston, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. The Friends of GKF and WAFA argue (based on information supplied by Dr. Jean-

Paul Orsini, but not verified, see Section 2.4) that the Greater Kingston area is "one of the three most important areas for the conservation of endangered species in the South-West of WA". The campaigns by Friends of GKF and WAFA have included press releases, submissions to Government, setting up information stalls and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk on the values of old growth forest. Over this period there was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

The Bridgetown-Greenbushes Friends of the Forest group has also campaigned against logging in the Kingston Forest, starting a Supreme Court action to stop logging in the area in 1996. In the same year, the Conservation Council requested that CLM place Kingston on its deferred list (of logging areas) because of its high conservation value and the presence of endangered species. The court declined to grant an injunction against logging in Kingston in February 1997, although the court did indicate that it was arguable that logging and burning would restrict the effort to save endangered species in the block.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage value.
In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c.* 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Fiends of GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (unverified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of very high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believe should be included in the National Park, but are not currently proposed for reservation, are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Kingston part of 4 & 5, all 6 & 7; Corbal 1 and adjacent areas. The conservation values that the Friends argue belong to these compartments (except Corbal 1) are: old growth forest (here selectively logged only once prior to 1970); structural diversity providing a wide range of endangered species habitats; forest type of higher rainfall part of area which is not well represented in the proposed National Park; heritage; corridor linkages; a large area of unfragmented Jarrah forest (rare); and easy accessibility to Bridgetown and Manjimup and greater potential for tourism activity

(unverified, see Section 2.4). These areas (except for Corbal 1) are included in the area registered by the National Trust as having high heritage values as natural and cultural landscapes.

Biodiversity comments

A submission by Dr. Jean-Paul Orsini indicates that the Priority Species *Grevillea cirsiifolia* is present in Kingston (unverified, see Section 2.4).

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Kinkin *2002 Harvest Plan*

Kinkin is 4,940 ha in size, of which 720 ha are informally reserved. There are an additional 210 ha of old growth forest in the part of Kinkin currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 3,780 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,641	3,668	0.7
Jarrah Woodland	106,374	52.1	27.5	24.6	30	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	182	100	0.05
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	44	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,981	1,816	2.4
CL1	15,179	22.1	9.9	12.2	416	333	2.2
CO1	5,105	21.0	14.0	7.0	228	203	4.0
CRb	52,753	38.6	29.7	8.9	190	118	0.2
CT	3,128	56.9	32.7	24.2	300	223	7.1
MT1	3,196	13.7	8.3	5.4	141	138	4.3
PM2	3,741	8.8	0	8.8	13	11	0.3
QP	647	20.2	0	20.2	7	7	1.1
ST	2,325	52.7	7.4	45.3	93	28	1.2
TP	990	2.7	0	2.7	53	53	5.4
WH2	6,444	17.8	1.4	16.4	413	252	3.9
WL	5,906	31.3	8.9	22.4	110	30	0.5
YN2	6,744	25.0	1.3	23.7	659	482	7.1
YR	19,259	29.3	13.5	15.8	115	76	0.4

Other Biodiversity Values

Threatened Fauna

There is one record of a Chuditch occurring in Kinkin. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and is considered vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 of which occur on gazetted reserved land.

Social Value and Community Attachment

Based on the information collected for this assessment, there appears to be no social values associated with, or community attachment to, Kinkin block.

Lane

Lane is 1,250 ha in size, with 380 ha informally reserved. There are another 50 ha of old growth forest in the part of Lane currently intended to remain as State forest available for multiple use which will be protected through the exclusion of timber ahrvesting operations.
Area being assessed: 820 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	224	159	0.03
Jarrah Woodland	106,374	52.1	27.5	24.6	1	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	998	662	0.3
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	24	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	30	5	0.01
COb	21,839	77.2	75.3	1.9	154	88	0.4
CRd	1,904	45.9	39.6	6.3	2	1	0.05
CRy	33,764	33.9	24.6	9.3	525	392	1.2
S1	25,513	64.8	53.2	11.6	66	23	0.09
S3	6,226	73.1	62.1	11.0	90	58	0.9
V1	2,285	69.7	16.3	53.4	20	7	0.3
Vh2	9,968	58.4	44.1	14.3	362	247	2.5

Other Biodiversity Values

High biophysical naturalness (126 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 8 ha[1] Increase in reservation: <0.01%

[1] These 8 ha may be an artifact of the grid system used by the Forest Management Information System.

High concentration of relictual flora

Level of reservation: 68% (62% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Threatened Fauna

There is one record of the Red-tailed Black Cockatoo occurring in Lane. The Cockatoo is a Priority Three species (not covered by legislation) and there are 177 records of the species occurring in the RFA area. Five of these records are from gazetted reserved land.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 24 ha Increase in reservation: <0.01%

Lane was the subject of a meeting between stakeholder and Government Ministers. No further information is available.

Lewin *2002 Harvest Plan*

Lewin is 4,570 ha in size, with 1,200 ha informally reserved. There are a further 140 ha of old growth forest in the part of Lewin currently intended to remain State forest available for multiple use which will be protected through the exlcusion of timber harvesting operations.

Area being assessed: 3,230 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,386	2,600	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	39	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	1027	616	0.3
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	102	0	0

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	65	33	0.1
BE1	76,781	16.8	9.2	7.6	2,027	1,551	2.0
CL1	15,179	22.1	9.9	12.2	63	36	0.2
CO1	5,105	21.0	14.0	7.0	15	15	0.3
CRb	52,753	38.6	29.7	8.9	13	13	0.02
CRd	1,904	45.9	39.6	6.3	45	43	2.3
CRy	33,764	33.9	24.6	9.3	199	186	0.6
LF	20,578	44.1	19.6	24.5	14	12	0.06
PM1	25,801	23.5	8.6	14.9	865	516	2.0
WH1	20,321	34.7	10.9	23.8	610	390	1.9
YN1	23,494	35.5	14.4	21.1	638	422	1.8

Other Biodiversity Values

Threatened Fauna

There are three records of Red-tailed Black Cockatoo occurring in Lewin. The Cockatoo is a Priority Three species and there are 177 records for the species in the RFA area, five of which occur on gazetted reserved land.

There is one record of a Quenda occurring in Lewin. Quenda are a Priority Four species and there are 162 records for the species in the RFA area, three of which occur on gazetted reserved land.

There are 12 records of Quokka occurring in Lewin. Quokka are listed as being rare or likely to be extinct and are considered vulnerable by the IUCN. There are 126 records of Quokka occurring in the RFA area, four of which occur on gazetted reserved land.

Social Value and Community Attachment

In 1976, scientific study was the management priority for Lewin (Forests Department, 1977a). Research in Lewin focused on hydrological studies, examining the effect of regeneration on water quality.

The local community group, Friends of the Blackwood Valley (formed 10 years ago) has informally expressed an attachment in Lewin (during a phone conversation with Alison Cassanet), which is used by locals as a picnic and camping site. The group has not made any submissions about the block.

Lindsay *2002 Harvest Plan*

Lindsay is 4,640 ha in size, 780 ha are informally reserved. There area further 30 ha of old growth forest in the part of Lindsay currently intended to remain State forest available for multiple use which will be protected through exclusion of timber harvesting operations.

Area being assessed: 3,840 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,835	1,659	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	16	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	2,700	2,130	1.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	34	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	5	4	0.01
BE1	76,781	16.8	9.2	7.6	1,359	1,337	1.7
CRb	52,753	38.6	29.7	8.9	494	460	0.9
CRd	1,904	45.9	39.6	6.3	11	9	0.5
CRy	33,764	33.9	24.6	9.3	218	197	0.6
LF	20,578	44.1	19.6	24.5	247	183	0.9
PM1	25,801	23.5	8.6	14.9	201	166	0.6
WA	8,621	57.8	31.1	26.7	566	248	2.9
WH1	20,321	34.7	10.9	23.8	1,331	1,063	5.2
YN1	23,494	35.5	14.4	21.1	153	121	0.5

Other Biodiversity Values

High biophysical naturalness (173 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 55 ha Increase in reservation: <0.01%

Threatened Fauna

There are five records of Red-tailed Black Cockatoo occurring in Lindsay. The Cockatoo is a Priority Three species and there are 177 records for the species in the RFA area, five of which occur on gazetted reserved land.

There is one record of a Quenda occurring in Lindsay. Quenda are a Priority Four species and there are 162 records for the species in the RFA area, three of which occur on gazetted reserved land.

There are two records of Quokka occurring in Lindsay. Quokka are listed as being rare or likely to be extinct and are considered vulnerable by the IUCN. There are 126 records of Quokka occurring in the RFA area, four of which occur on gazetted reserved land.

The Donnelly River passes along the western edge of Lindsay. The river is protected by informal reserves along its length.

Social Value and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 186 ha Increase in reservation: 0.04%

In 1976, scientific study was the management priority for Lindsay (Forests Department, 1977a). Research in Lindsay examined catchment protection.

The Bibbulmun track passes through Lindsay. The track is buffered on both sides by informal and formal reserves.

Little Quininup Brook system

This area is 850 ha in size, of which 140 ha are informally reserved. There are another 220 ha of old growth forest in the part of the the system currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 490 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	671	393	0.07
Jarrah Woodland	106,374	52.1	27.5	24.6	2	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	125	98	0.05
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	52	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	305	221	0.3
CO1	5,105	21.0	14.0	7.0	15	13	0.3
CRb	52,753	38.6	29.7	8.9	140	113	0.2
CT	3,128	56.9	32.7	24.2	336	112	3.6
QP	647	20.2	0	20.2	5	1	0.2
TP	990	2.7	0	2.7	47	30	3.0
WH1	20,321	34.7	10.9	23.8	2	1	<0.01

Other Biodiversity Values

There appears to be no other biodiversity features that meet the criteria in Appendix One in the Little Quinninup Brook system.

Social Values and Community Attachment

At the FMP forum held in Perth, 11 September 2001, community members proposed reserving all of the Little Quinninup Brook system to extend the Greater Dordagup National Park. They argued that this was necessary to protect the "long-term viability of the hydrology" of the area. The area has been identified by CLM and the WRC (now DEWCaP) as an area sensitive to rises in saline groundwater. Extra protection is provided to such areas in the event of timber harvesting.

Mersea

Mersea is 3,750 ha in size, of which 1,210 ha are reserved (750 ha are in formal reserves). Area being assessed: 2,530 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,385	2,510	0.5
Jarrah Woodland	106,374	52.1	27.5	24.6	21	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	310	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	143	0	0
BE2	45,828	36.3	32.8	3.5	671	633	1.4
CL1	15,179	22.1	9.9	12.2	138	118	0.8
CL2	26,357	52.3	47.0	5.3	516	502	1.9
CO1	5,105	21.0	14.0	7.0	200	128	2.5
CO2	3,813	33.1	30.6	2.5	198	185	4.9
KP	1,160	21.7	5.9	15.8	7	0	0
MT1	3,196	13.7	8.3	5.4	268	1	0.03
WH3	4,766	36.5	26.9	9.6	7	5	0.1
YN2	6,744	25.0	1.3	23.7	467	338	5.0
YR	19,259	29.3	13.5	15.8	1,101	594	3.1

Other Biodiversity Values

Declared Rare and Priority Flora

There is one population of the Declared Rare species, *Caladenia christineae* in Mersea. Across the RFA area, there are 26 populations of *C. christineae*, five of these populations occur on reserved land (reservation level of 19.2%). The population in Mersea is protected through the exclusion of operations during timber harvesting. Formally reserving the population in Mersea would increase the reservation level by 38%.

Threatened Fauna

There are records of six Threatened Fauna occurring in Mersea.

Species	Status	No. records in Mersea	No. records in RFA area	No. records from reserved land
Brush-tailed Phascogale	Priority Three	2	84	1
Red-tailed Black Cockatoo	Priority Three	4	177	5
Numbat	Rare or likely to become extinct & vulnerable	1	140	3
Quenda	Priority Four & conservation dependent	7	162	3
Western Ringtail Possum	Rare or likely to become extinct & vulnerable	2	63	2
Woylie	Priority Four & conservation dependent	1	110	3

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Mersea, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. The Friends and WAFA argue (based on information supplied by Dr. Jean-Paul Orsini, but not verified, see Section 2.4) that the Greater Kingston area is "one of the three most important areas for the conservation of endangered species in the South-West of WA". The campaigns by Friends of GKF and WAFA have included press releases, submissions to Government, setting up information stalls and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk at the camp. Over this period there was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries, which includes the Greater Kingston Forest area. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage value.

In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c*. 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Fiends of GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (unverified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of very high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believes should be included in National Park are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Corbal 1 and adjacent areas. The conservation values that the Friends argue belong to these compartments (except Corbal 1) are: old growth forest (here selectively logged only once prior to 1970); structural diversity providing a wide range of endangered species habitats; forest type of higher rainfall part of area which is not well represented in the proposed National Park; heritage; corridor linkages; a large area of unfragmented Jarrah forest (rare); and easy accessibility to Bridgetown and Manjimup and greater potential for tourism activity (unverified, see Section 2.4).

Biodiversity comments

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Mindanup *2002 Harvest Plan*

Of the 4,870 ha within Mindanup, 2,710 ha are reserved, with 2,390 ha formally reserved. There are a further 140 ha of old growth forest in the part of Mindanup currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,010 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,718	1,734	0.3
Jarrah Woodland	106,374	52.1	27.5	24.6	71	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	807	275	0.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	273	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	141	0	0
BEb	5,306	55.8	42.6	13.2	832	420	7.9
BEy1	27,979	68.4	60.1	8.3	2,654	1,268	4.5
CM	24,527	54.1	50.2	3.9	219	105	0.4
Pi	13,827	95.9	95.0	0.9	215	0	0
QN	9,071	59.2	58.4	0.8	77	2	0.02
S1	25,513	64.8	53.2	11.6	724	214	0.8
S3	6,226	73.1	62.1	11.0	5	0	0

Other Biodiversity Values

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Social Values and Community Attachment

There appears to be no social values associated with, or community attachment to, Mindanup that meets the criteria in Appendix One.

Mossop

Mossop is 3,500 ha in size, with 2,980 ha reserved (2,900 ha are formally reserved). There are a further 30 ha of old growth forest in the part of Mossop currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations. Mossop was included in this assessment as part of the link between the Shannon National Park and the Mt Frankland National Park.

Area being assessed: 480 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,246	106	0.02
Jarrah Woodland	106,374	52.1	27.5	24.6	22	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	898	375	0.2
Rocky Outcrops	26,400	44.8	29.1	15.7	14	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	1,316	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BU	7,029	99.5	99.5	0	242	28	0.4
COb	21,839	77.2	75.3	1.9	167	15	0.07
COy1	22,876	72.4	71.6	0.8	409	33	0.1
MTb	11,817	82.6	80.8	1.8	337	135	1.1
Mty1	20,426	91.1	90.9	0.2	806	253	1.2
Pi	13,827	95.9	95.0	0.9	1,261	8	0.06
Q	14,958	87.4	80.6	6.8	40	0	0
S1	25,513	64.8	53.2	11.6	182	9	0.03
S3	6,226	73.1	62.1	11.0	51	0	0

Other Biodiversity Values

There are no other biodiversity features in Mossop that meet the criteria in Appendix One.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 7 ha[2] Increase in reservation: <0.01%

Participants of the FMP forum held in Perth, 11 September 2001 raised the issue that blocks linking the Shannon National Park and Mt Frankland National Park had high conservation values.

Muirillup

Muirillup is 4,380 ha in size, of which 2,910 ha are reserved (2,390 ha are in formal reserves). There are a further 330 ha of old growth forest in the part of Muirillup currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 1,140 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	890	114	0.02
Jarrah Woodland	106,374	52.1	27.5	24.6	37	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	2,605	1,022	0.5
Rocky Outcrops	26,400	44.8	29.1	15.7	26	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	812	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	643	37	0.09
COb	21,839	77.2	75.3	1.9	826	201	0.9
COd	2,118	36.2	27.6	8.6	604	350	16.8
COy1	22,876	72.4	71.6	0.8	805	244	1.1
CRb	52,753	38.6	29.7	8.9	60	53	0.1
Kb	28,345	64.4	64.3	0.1	9	0	0
MTb	11,817	82.6	80.8	1.8	190	0	0
Q	14,958	87.4	80.6	6.8	223	26	0.2
S1	25,513	64.8	53.2	11.6	292	4	0.02
S3	6,226	73.1	62.1	11.0	235	0	0
V4	5,420	91.7	91.1	0.6	21	2	0.04
Vh2	9,968	58.4	44.1	14.3	294	131	1.3
Vh3	12,396	72.4	66.7	5.7	167	88	0.7

[1] This 1 ha may be an artifact of the grid system used by the Forest Management Information System.

[2] These 7 ha may be an artifact of the grid system used by FMIS.

Other Biodiversity Values

High biophysical naturalness (2,552 ha in total)

Level of reservation:	98% (88% formal)		
Amount not reserved:	229 ha	Increase in reservation:	0.03%

The Muirillup area has been identified as an Interim National Estate place for its natural values (Commonwealth and Western Australian RFA Steering Committee, 1998d).

Social Values and Community Attachment

High aesthetic value

Level of reservation:	64% (61% formal)		
Amount not reserved:	61 ha	Increase in reservation:	0.01%

In 1982, 190 ha of Muirillup was included in a Management Priority Area for which the primary use was to be recreation (Forests Department, 1982). The Muirillup MPA contained the following features relevant to recreation: virgin Karri forest; granite outcrops; and scenic qualities.

In 1987 the Australian Conservation Foundation, in conjunction with several conservation groups, proposed changing the status of the Forest Park/Reserve in Muirillup to a State Park and expanding the Muirillup MPA using buffer zones (Australian Conservation Foundation, 1987).

The Minister for the Environment and Heritage received three letters about Muirillup between February 2001 and October 2001.

The WA Forest Alliance sent a letter (12 December 2001) to the Minister for the Environment and Heritage which stated the WAFA's belief that logging in Muirillup would impact on old growth forest, freshwater ecosystems and tourism values.

Murtin *2002 Harvest Plan*

Murtin is 7,510 ha in size and 4,480 ha are reserved, 3,970 ha are formally reserved. There are a further 530 ha of old growth forest in the part of Murtin currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,510 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,744	2,263	0.4
Jarrah Woodland	106,374	52.1	27.5	24.6	41	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	2,110	231	0.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	582	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,044	806	1.0
BEb	5,306	55.8	42.6	13.2	62	0	0
BEy1	27,979	68.4	60.1	8.3	1,299	10	0.04
CL1	15,179	22.1	9.9	12.2	766	531	3.5
CM	24,527	54.1	50.2	3.9	683	0	0
CO1	5,105	21.0	14.0	7.0	103	56	1.1
CP	3,943	77.2	60.1	17.1	1,829	88	2.2
CRb	52,753	38.6	29.7	8.9	146	99	0.2
CRy	33,764	33.9	24.6	9.3	11	2	0.01
CT	3,218	56.9	32.7	24.2	44	0	0
MT1	3,196	13.7	8.3	5.4	174	169	5.3
PM2	3,741	8.8	0	8.8	33	12	0.3
QN	9,071	59.2	58.4	0.8	43	3	0.03
S1	25,513	64.8	53.2	11.6	123	0	0
ST	2,325	52.7	7.4	45.3	7	3	0.1
Vh3	12,396	72.4	66.7	5.7	3	0	0
WH2	6,444	17.8	1.4	16.4	476	300	4.7
YN1	23,494	35.5	14.4	21.1	5	0	0
YN2	6,744	25.0	1.3	23.7	641	414	6.1

Other Biodiversity Values

Declared Rare and Priority Flora

The Declared Rare species, *Caladenia winfieldii*, has been recorded from Murtin. There are only two known populations of this species (both of which occur within the Regional Forest Agreement area) and neither lies within the reserve system. Placing the population in Murtin in reserve would increase the formal reservation level of *C. winfieldii* by 50%. The population is protected through the exclusionn of operations during timber harvesting.

Social Value and Community Attachment

The Conservation Council has recommended that Murtin be the highest priority for conservation, because, they argue, timber production in the State Forest part of the block would negatively impact on the southern half of the block which is within the Shannon National Park (Conservation Council, 1994).

Nairn *2002 Harvest Plan*

Nairn is 4,980 ha in size and 2,050 ha are reserved (1,220 ha are formally reserved). There are a further 40 ha of old growth forest in the part of Nairn currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,850 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,636	640	0.1
Karri Main Belt	193,000	48.2	36.2	12.0	3,192	2,200	1.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	124	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,104	484	0.6
CL1	15,179	22.1	9.9	12.2	330	0	0
CO1	5,105	21.0	14.0	7.0	131	0	0
CRb	52,753	38.6	29.7	8.9	1,028	956	1.8
CRy	33,764	33.9	24.6	9.3	377	339	1.0
CT	3,128	56.9	32.7	24.2	226	16	0.5
LF	20,578	44.1	19.6	24.5	374	295	1.4
PM1	25,801	23.5	8.6	14.9	74	63	0.2
S1	25,513	64.8	53.2	11.6	184	105	0.4
Vh2	9,968	58.4	44.1	14.3	315	160	1.6
Vh3	12,396	72.4	66.7	5.7	135	58	0.5
WA	8,621	57.8	31.1	26.7	220	114	1.3
WH1	20,321	34.7	10.9	23.8	230	99	0.5
YN1	23,494	35.5	14.4	21.1	194	150	0.6

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Nairn.

Social Value and Community Attachment

There appears to be no social values associated with Nairn, or any evidence of community attachment to the block.

Northcliffe

Northcliffe is 4,390 ha in size, 3,370 ha are reserved (3,010 ha of this are in formal reserves). There are a further 80 ha of old growth forest forest in the part of Northcliffe currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 870 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,240	180	0.03
Jarrah Woodland	106,374	52.1	27.5	24.6	316	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	1,722	688	0.4
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	1,084	0	0
Swamps	15,300	42.8	40.0	2.8	7	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	297	25	0.06
BWp	32,542	81.0	81.0	0	822	0	0
COb	21,839	77.2	75.3	1.9	1,357	212	1.0
COy1	22,876	72.4	71.6	0.8	154	22	0.1
CRb	52,753	38.6	29.7	8.9	833	389	0.7
CRy	33,764	33.9	24.6	9.3	46	6	0.02
Ms	7,714	91.1	91.1	0	20	0	0
Q	14,958	87.4	80.6	6.8	22	10	0.07
S1	25,513	64.8	53.2	11.6	193	130	0.5
S3	6,226	73.1	62.1	11.0	2	0	0
S4	1,569	23.6	23.3	0.3	97	10	0.6
Vh2	9,968	58.4	44.1	14.3	510	65	0.7

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Northcliffe.

Social Values and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 6 ha[1] Increase in reservation: <0.01%

Between February 2001 and October 2001, the Minister for the Environment and Heritage received one letter about Northcliffe.

[1] These 6 ha may be an artifcat of the grid system used by the Forest Management Information System.

Poole

Poole is 7,950 ha in size, of which 2,910 ha are reserved (2,030 ha are formally reserved). There are an additional 370 ha of old growth forest in the part of Poole currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 4,670 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	2,771	1,053	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	58	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	4,570	3,608	1.9
Rocky Outcrops	26,400	44.8	29.1	15.7	2	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	543	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	60	42	0.1
BE1	76,781	16.8	9.2	7.6	253	1	<0.01
BEb	5,306	55.8	42.6	13.2	21	0	0
BEy1	27,979	68.4	60.1	8.3	1,337	386	1.4
COb	21,839	77.2	75.3	1.9	3	2	0.01
COy1	22,876	72.4	71.6	0.8	71	54	0.2
CP	3,943	77.2	60.1	17.1	89	0	0
CRb	52,753	38.6	29.7	8.9	1,898	1,671	3.2
CRd	1,904	45.9	39.6	6.3	84	73	3.8
CRy	33,764	33.9	24.6	9.3	1,350	1,138	3.4
Pi	13,827	95.9	95.0	0.9	544	9	0.06
QN	9,071	59.2	58.4	0.8	31	0	0
S1	25,513	64.8	53.2	11.6	1,750	1,034	4.1
S3	6,226	73.1	62.1	11.0	189	111	1.8
Vh3	12,396	72.4	66.7	5.7	266	141	1.1

Other Biodiversity Values

High biophysical naturalness (2,326 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 26 ha Increase in reservation: <0.01%

Social Values and Community Attachment

Poole was the subject of a meeting between stakeholders and Government Ministers. No further information is available.

Poorginup

Poorginup is 3,740 ha in size and all of Poorginup is formally reserved. The forest ecosystems and vegetation complexes present in Poorginup are included in this report to provide an indication of the conservation values reserved in Poorginup.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	3,265	0	0
Jarrah Unicup	81,000	20.0	20.0	0.0	11	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	97	0	0
Shrub, Herb & Sedgeland	429,900	59.3	51.8	7.5	360	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BEy1	27,979	68.4	60.1	8.3	2,240	0	0
CM	24,527	54.1	50.2	3.9	643	0	0
QN	9,071	59.2	58.4	0.8	392	0	0
S2	21,123	39.3	36.2	3.1	238	0	0
S3	6,226	73.1	62.1	11.0	210	0	0
UC2	3,207	72.6	72.6	0	11	0	0

There are other conservation values present in Poorginup (e.g. presence of seven Threatened Fauna species), but as all of Poorginup is reserved these values are already protected.

Rocky

Rocky is 6,970 ha in size, with 5,120 ha reserved (4,780 ha of this are formally reserved). There are a further 620 ha of old growth forest forest in the part of Rocky currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 1,230 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	6,474	1,221	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	217	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	35	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	224	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BEy1	27,979	68.4	60.1	8.3	2,550	854	3.1
CA	59,511	96.9	96.9	0	26	0	0
Ky	14,746	84.6	84.6	0	524	0	0
Lp	14,405	98.9	98.9	0	611	0	0
Mty1	20,426	91.1	90.9	0.2	1,190	0	0
QN	9,071	59.2	58.4	0.8	116	48	0.5
S1	25,513	64.8	53.2	11.6	22	0	0
S2	21,123	39.3	36.2	3.1	1,367	311	1.5
S3	6,226	73.1	62.1	11.0	29	0	0
t	5,253	33.7	33.7	0	112	0	0
V4	5,420	91.7	91.1	0.6	35	7	0.1
Va2	11,006	46.9	46.9	0	250	0	0
Va3	5,468	56.5	56.5	0	118	0	0

Other Biodiversity Values

Area of high flora endemism

Level of reservation: 64% (61% formal)

Amount not reserved: 156 ha Increase in reservation: 0.07%

Threatened Fauna

There are three records of Quokka occurring in Rocky. Quokka are listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 126 records of Quokka occurring in the RFA area, four of these are from gazetted reserved land.

There are also two records of the Western Brush Wallaby occurring in Rocky. The Western Brush Wallaby is a Priority Four species (not protected by legislation). There are 99 records of the Wallaby occurring in the RFA area, no records are from land that is currently reserved.

Social Values and Community Attachment

Biodiversity comments

In 1994 the Conservation Council recommended that no logging should occur in any part of Rocky because of its high biodiversity values, as assessed by the Australian Heritage Commission (Conservation Council, 1994).

The WA Forest Alliance proposed in 1998 that all of Rocky be reserved, along with many other blocks, to form the Walpole Wilderness Reserve. The WAFA lists the following values as belonging to this group of blocks: old growth Karri, Jarrah, Tingle and Blackbutt forests (using the WAFA's definition of old growth); majority interim listed on Register of National Estate; many values identified by the Australian Heritage Commission (endangered species, endemic species, species and ecosystem richness, diversity); high wilderness, landscape, geomorphological and aesthetic values; Gondwanic relictual species; and wetlands, granite outcrops and wild rivers (unverified, see Section 2.4). Many of these values are now protected by the formation of the Walpole Wilderness Reserve following the RFA.

Spring

Spring is 3,260 ha in size, of which 1,520 ha are reserved (1,320 ha are in formal reserves). There are a further 790 ha of old growth forest forest in the part of Spring currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.
Area being assessed: 940 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	2,752	896	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	57	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	215	42	0.02
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	235	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BEb	5,306	55.8	42.6	13.2	259	40	0.8
BEy1	27,979	68.4	60.1	8.3	1,889	701	2.5
CM	24,527	54.1	50.2	3.9	216	8	0.03
QN	9,071	59.2	58.4	0.8	166	10	0.1
S1	25,513	64.8	53.2	11.6	198	56	0.2
S2	21,123	39.3	36.2	3.1	206	69	0.3
S3	6,226	73.1	62.1	11.0	325	53	0.9

Other Biodiversity Values

Declared Rare and Priority Flora

There is one population of the Declared Rare species, *Caladenia harringtoniae* in Spring. There are 40 populations of *C. harringtoniae* in the RFA area, 14 of these occur on land that is reserved (reservation level of 35%). The population of *C. harringtoniae* is protected throught the exclusion of operations during timber harvesting. Formally reserving the population would increase the reservation level of this species by 2.5%.

Threatened Fauna

There is one record of Chuditch occurring in Spring. Chuditch is listed as being rare or likely to become extinct under the *Wildlife Conservation Act 1950* and vulnerable by the IUCN. There are 379 records of Chuditch occurring in the RFA area, 17 are from gazetted reserved land.

Social Values and Community Attachment

Spring was identified as containing Aboriginal Heritage places, but there was insufficient documentation for Spring to be identified as an National Estate place of aboriginal social value (Commonwealth and Western Australian RFA Steering Committee, 1998d).

Spring was the subject of a meeting between stakeholders and Government Ministers. No further information is available.

Stoate *2002 Harvest Plan*

Stoate is 6,010 ha in size, of which 1,920 ha are reserved. 840 ha are formally reserved. There are a further 20 ha of old growth forest forest in the part of Stoate currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.
Area being assessed: 4,040 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	5,380	4,006	0.7
Jarrah Unicup	81,000	20.0	20.0	0	50	31	0.04
Jarrah Woodland	106,374	52.1	27.5	24.6	317	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	253	0	0
Swamps	15,300	42.8	40.0	2.8	4	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	74	61	0.2
BE1	76,781	16.8	9.2	7.6	2,533	2,376	3.1
BE2	45,828	36.3	32.8	3.5	128	86	0.2
CB	6,137	46.2	33.2	13.0	281	213	3.5
CC2	13,054	54.0	50.6	3.4	82	55	0.4
CL1	15,179	22.1	9.9	12.2	1,790	663	4.4
CM	24,527	54.1	50.2	3.9	615	354	1.4
CO1	5,105	21.0	14.0	7.0	100	57	1.1
CO2	3,813	33.1	30.6	2.5	10	10	0.3
ST	2,325	52.7	7.4	45.3	171	34	1.5
YR	19,259	29.3	13.5	15.8	221	130	0.7

Other Biodiversity Values

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 2 ha[1] Increase in reservation: <0.01%

[1] These 2 ha may be an artifact of the grid system used by the Forest Management Information System.

Declared Rare and Priority Flora

The Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c) indicates that there are three records of the Declared Rare species, *Caladenia christineae,* occurring within Stoate. In total there are 26 populations of this species in the CLM database (some populations occur outside the Regional Forest Agreement area) and 19.2% are reserved. Reserving the populations within Stoate would increase this by 38%. The populations in Stoate are currently protected through the exclusion of operations during timber harvesting.

Threatened Fauna

There are records of seven Threatened Fauna occurring in Stoate.

Species	Status	No. records in Stoate	No. records in RFA area	No. records on reserved land
Baudin's Cockatoo	Rare or likely to become extinct & vulnerable	1	28	1
Chuditch	Rare or likely to become extinct & vulnerable	4	379	17
Red-tailed Black Cockatoo	Priority Three	1	177	5
Quenda	Priority Four	1	162	3
Western Brush Wallaby	Priority Four	7	99	0
Western Long-billed Corella	Rare or likely to become extinct & endangered	1	18	0
Western Ringtail Possum	Rare or likely to become extinct & vulnerable	1	63	2

Corridors and Linkages

Part of Stoate has the potential to act as a corridor between reserves proposed as a consequence of the Government's "*Protecting our old growth forests*" policy in the northern part of Stoate and Boyndaminup.

Social Value and Community Attachment

In 1994 the Conservation Council argued that Stoate had high conservation value (Conservation Council, 1994).

Strickland *2002 Harvest Plan*

Strickland is 2,800 ha in size and 1,740 ha are reserved, of which 1,200 ha are formally reserved. There are an additional 150 ha of old growth forest in the part of Strickland currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 920 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,801	785	0.1
Jarrah Blackwood	347,200	31.2	23.9	7.3	88	15	<0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	12	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	820	105	0.1
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	64	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BD	47,785	46.8	28.4	18.4	16	6	0.01
BE1	76,781	16.8	9.2	7.6	403	229	0.3
CE	24,295	46.2	25.7	20.5	8	0	0
CRb	52,753	38.6	29.7	8.9	544	106	0.2
CRy	33,764	33.9	24.6	9.3	32	0	0
DO	2,288	90.3	78.5	11.8	791	1	0.04
DS	29,108	7.8	7.6	0.2	61	44	0.2
KI	102,240	33.7	26.4	7.3	87	8	<0.01
LF	20,578	44.1	19.6	24.5	488	358	1.7
WA	8,621	57.8	31.1	26.7	127	0	0
WH1	20,321	34.7	10.9	23.8	111	83	0.4
WS2	3,332	35.5	28.7	6.8	105	69	2.1

Other Biodiversity Values

Threatened Fauna

There are two records of the Red-tailed Black Cockatoo (Priority Three species) occurring in Strickland. There are 177 records of this species occurring in the RFA area, five of which occur on gazetted reserved land.

Social Value and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

[1] This may be an artifact of the grid system used by the Forest Management Information System.

Sutton *2002 Harvest Plan*

Sutton is 9,090 ha in size with 2,540 ha reserved. Of this 1,660 ha are formally reserved. There are a further 1,420 ha of old growth forest in the part of Sutton currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 5,110 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	2,581	1,172	0.2
Jarrah Woodland	106,374	52.1	27.5	24.6	8	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	6,334	3,886	2.0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	101	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	1	0	0
BE1	76,781	16.8	9.2	7.6	1,597	1,246	1.6
BEb	5,306	55.8	42.6	13.2	154	7	0.1
BEy1	27,979	68.4	60.1	8.3	239	57	0.2
CL1	15,179	22.1	9.9	12.2	219	107	0.7
CO1	5,105	21.0	14.0	7.0	5	5	0.1
CP	3,943	77.2	60.1	17.1	274	155	3.9
CRb	52,753	38.6	29.7	8.9	2,007	1,556	2.9
CRy	33,764	33.9	24.6	9.3	928	438	1.3
CT	3,128	56.9	32.7	24.2	272	87	2.8
LF	20,578	44.1	19.6	24.5	577	242	1.2
PM1	25,801	23.5	8.6	14.9	262	188	0.7
PM2	3,741	8.8	0	8.8	11	0	0
Pi	13,827	95.9	95.0	0.9	19	0	0
QN	9,071	59.2	58.4	0.8	56	11	0.1
S1	25,513	64.8	53.2	11.6	916	211	0.8
WH1	20,321	34.7	10.9	23.8	320	158	0.8
WH2	6,444	17.8	1.4	16.4	5	1	0.02
YN1	23,494	35.5	14.4	21.1	1,165	588	2.5
YN2	6,744	25.0	1.3	23.7	0.5	0	0

Other Biodiversity Values

High biophysical naturalness (2,971 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 9 ha[1] Increase in reservation: <0.01%

[1] This may be an artifact of the grid system used by the Forest Management Information System.

Threatened Fauna

There is one record of a Quenda (Priority Four species and considered dependent on conservation by the IUCN) occurring in Sutton. There are 162 records for this species occurring in the RFA area, three of which occur on gazetted reserved land.

Social Value and Community Attachment

In 1976, scientific study was the management priority for Sutton (Forests Department, 1977a). Research in Sutton focused on determining the effect of regeneration on water quality.

Swarbrick

Swarbrick is 2,910 ha in size, with 2,900 ha formally reserved.

Area being assessed: 10 ha. The area being assessed is mostly cleared or heavily disturbed.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	48	0	0
Jarrah Woodland	106,374	52.1	27.5	24.6	95	0	0
Jarrah Yellow Tingle	11,600	75.2	75.2	0	422	0	0
Jarrah Red Tingle[1]	350	64.9	64.9	0	3	0	0
Karri Main belt	193,000	48.2	36.2	12.0	62	0	0
Karri Red Tingle	7,200	72.4	72.4	0	86	0	0
Karri Yellow Tingle	15,800	75.4	75.4	0	1,373	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	797	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	470	0	0
COb	21,839	77.2	75.3	1.9	42	0	0
COy1	22,876	72.4	71.6	0.8	20	0	0
HA	5,664	18.1	18.0	0.01	88	0	0
Kb	28,345	64.4	64.3	0.1	1,668	0	0
KO	2,722	38.5	38.5	0	225	0	0
Ky	14,746	84.6	84.6	0	90	0	0
MTb	11,817	82.6	80.8	1.8	38	0	0
Mty1	20,426	91.1	90.9	0.2	1	0	0
Q	14,958	87.4	80.6	6.8	174	0	0
Vh2	9,968	58.4	44.1	14.3	7	0	0
Vh3	12,396	72.4	66.7	5.7	65	0	0

[1] Rare ecosystem.

Other Biodiversity Values

There are no other biodiversity features that meet the criteria in Appendix One in Swarbrick.

Social Values and Community Attachment

There are no such values associated with the remaining 10 ha of Swarbrick.

Walcott

Walcott is 4,810 ha in size, with 4,680 ha formally reserved.

Area being assessed: 60 ha.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	69	0	0
Jarrah South	557,300	47.2	41.0	6.2	4,021	57	0.01
Jarrah Woodland	106,374	52.1	27.5	24.6	217	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	229	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	229	0	0
Wandoo Woodland	163,000	23.8	19.0	4.8	33	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	1,753	44	0.1
CB	6,137	46.2	33.2	13.0	805	0	0
CC2	13,054	54.0	50.6	3.4	137	0	0
CL2	26,357	52.3	47.0	5.3	984	3	0.01
CO2	3,813	33.1	30.6	2.5	102	0	0
DM2	41,469	7.0	7.0	0	17	0	0
NW2	16,837	12.1	11.7	0.4	54	0	0
NWg1	20,694	4.2	4.1	0.1	5	0	0
WH3	4,766	36.5	26.9	9.6	327	9	0.2
YR	19,259	29.3	13.5	15.8	536	0	0

Other Biodiversity Values

Declared Rare and Priority Flora

There is one record of a Priority Flora occurring in Walcott, based on the Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c). This Priority species in Walcott occurs on land that is reserved.

Threatened Fauna

There are records of five Threatened Fauna species occurring in Walcott.

Species	Status	No. records in Walcott	No. records in RFA area	No. records from reserved land
Brush-tailed Phascogale	Priority Three	1	84	1
Chuditch	Rare or likely to become extinct & vulnerable	1	379	17
Red-tailed Black Cockatoo	Priority Three	3	177	5
Numbat	Rare or likely to become extinct & vulnerable	2	140	3
Western Brush Wallaby	Priority Four	1	99	0

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Walcott, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. The Friends and WAFA argue (based on information supplied by Dr. Jean-Paul Orsini, but not verified, see Section 2.4) that the Greater Kingston area is "one of the three most important areas for the conservation of endangered species in the South-West of WA". The campaigns by Friends of GKF and WAFA have included press releases, submissions to Government, setting up information stalls and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk at the camp. Over this period there was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries, which includes the Greater Kingston Forest area. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage values.

In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c.* 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Fiends of GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has

having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (unverified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of very high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believe should be included in the National Park, but are not currently proposed for reservation, are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Kingston part of 4 & 5, all 6 & 7; Corbal 1 and adjacent areas. The conservation values that the Friends argue belong to these compartments (except Corbal 1) are: old growth forest (here selectively logged only once prior to 1970); structural diversity providing a wide range of endangered species habitats; forest type of higher rainfall part of area which is not well represented in the proposed National Park; heritage; corridor linkages; a large area of unfragmented Jarrah forest (rare); and easy accessibility to Bridgetown and Manjimup and greater potential for tourism activity (unverified, see Section 2.4). These areas (except for Corbal 1) are included in the area registered by the National Trust as having high heritage values as natural and cultural landscapes.

Biodiversity comments
A submission by Dr. Jean-Paul Orsini indicates that the Priority Species *Grevillea cirsiifolia* occurs in Walcott.

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Warren *2002 Harvest Plan*

Warren is 2,330 ha in size, of which 510 ha are reserved. 50 ha are formally reserved. There are a further 320 ha of old growth forest in the part of Warren currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.
Area being assessed: 1,490 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	142	20	<0.01
Karri Main Belt	193,000	48.2	36.2	12.0	2,143	1,468	0.8
Peppermint & Coastal Heath	80,100	72.5	72.3	0.2	18	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	5	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	4	4	0.01
CRb	52,753	38.6	29.7	8.9	1,189	1,005	1.9
PM1	25,801	23.5	8.6	14.9	87	68	0.3
Q	14,958	87.4	80.6	6.8	2	2	0.01
WA	8,621	57.8	31.1	26.7	756	252	2.9
WH1	20,321	34.7	10.9	23.8	7	0	0
YN1	23,494	35.5	14.4	21.1	261	156	0.7

Other Biodiversity Values

High biophysical naturalness (657 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 37 ha Increase in reservation: <0.01%

Declared Rare and Priority Flora

The Declared Rare and Priority Flora map provided by CLM (Map 15 in Volume 2 of the CRA report, Commonwealth and Western Australian Governments RFA Steering Committee, 1998c) indicates that there is one occurrence of a Priority Flora species in Warren.

Social Value and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 456 ha Increase in reservation: 0.09%

Warrup

Warrup is 5,840 ha in size, with 2,440 ha reserved (2,100 ha are formally reserved).
Area being assessed: 3,390 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	5,276	3,393	0.6
Jarrah Woodland	106,374	52.1	27.5	24.6	28	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	152	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	380	0	0
Wandoo Woodland	163,000	23.8	19.0	4.8	0.5	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	2,098	1,408	3.1
CB	6,137	46.2	33.2	13.0	563	337	5.5
CL2	26,357	52.3	47.0	5.3	603	432	1.6
CO2	3,813	33.1	30.6	2.5	111	93	2.4
MT2	3,104	24.7	17.9	6.8	209	62	2.0
WH3	4,766	36.5	26.9	9.6	2,168	1,027	21.6
YN2	6,744	25	1.3	23.7	50	34	0.5
YR	19,259	29.3	13.5	15.8	33	0	0

Other Biodiversity Values

Threatened Fauna

There are records of nine Threatened Fauna occurring in Warrup.

Species	Status	No. records in Warrup	No. records in RFA area	No. records from reserved land
Chuditch	Rare or likely to become extinct & vulnerable	1	379	17
Red-tailed Black Cockatoo	Priority Three	1	177	5
Numbat	Rare or likely to become extinct & vulnerable	6	140	3
Quenda	Priority Four & conservation dependent	1	162	3
Quokka	Rare or likely to become extinct & vulnerable	1	126	4
Tammar Wallaby[1]	Priority Four & conservation dependent	1	26	0
Western Brush Wallaby	Priority Four & conservation dependent	9	99	0
Western Ringtail Possum	Rare or likely to become extinct & vulnerable	1	63	2
Woylie	Priority Four and conservation dependent	3	110	3

[1] Tammar Wallaby's have been translocated to Warrup as part of the Western Shield programme.

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Warrup, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. The Friends and WAFA argue (based on information supplied by Dr. Jean-Paul Orsini, but not verified, see Section 2.4) that the Greater Kingston area is "one of the three most important areas for the conservation of endangered species in the South-West of WA". The campaigns by Friends of GKF and WAFA have included press releases, submissions to Government, setting up information stalls and organising and supporting a forest rescue camp. The forest rescue camp, called the Jarrah Embassy, was opened 31 August 1997 in Kingston, not with the aim of preventing logging, but to provide information to visitors. The camp remained in Kingston for four weeks, with several hundred people visiting the camp, including scientist Dr. Mary White who presented a talk at the camp. Over this period there

was some debate between CLM and the conservationists in the media about the impact of the forest camp. In addition, GWN TV did a feature on the camp.

In July 1997, the Bridgetown-Greenbushes Shire Council passed a motion opposing the logging of native forest within the Shire's boundaries, which includes the Greater Kingston Forest area. In submissions that the council made during the RFA process, the Greater Kingston was one of three areas in the Shire specially nominated as being of significant community heritage value.

In 1998, the National Trust of Australia placed the Greater Kingston Forest area on its national list of endangered heritage places. Prior to 1998 *c.* 19,000 ha area was registered by the National Trust (WA) in recognition of its very high heritage values as a natural and cultural landscape.

These campaigns and actions have, in the view of Dr. Jean-Paul Orsini (Co-ordinator of Fiends of GKF), altered the way the local community views the forest, raised awareness about forest conservation and raised the level of debate in the community about conservation and timber harvesting. Local community members see the forest area has having high educational value because of the presence of a wide variety of endangered and rare species and examples of medium-rainfall old growth forest (unverified, see Section 2.4).

Although the Greater Kingston National Park is now proposed as a consequence of past community action, it is the view of the Friends of GKF that key areas of very high conservation value have been left out of the new Park and they continue to campaign to reserve these areas. The compartments that the Friends of GKF believe should be included in the National Park, but are not currently proposed for reservation, are: Warrup 1, part of 2, 6, part of 7 & 8; Mersea 2 to 5; Dudijup 5; Kingston part of 4 & 5, all 6 & 7; Corbal 1 and adjacent areas. The conservation values that the Friends argue belong to these compartments (except Corbal 1) are: old growth forest (here selectively logged only once prior to 1970); structural diversity providing a wide range of endangered species habitats; forest type of higher rainfall part of area which is not well represented in the proposed National Park; heritage; corridor linkages; a large area of unfragmented Jarrah forest (rare); and easy accessibility to Bridgetown and Manjimup and greater potential for tourism activity (unverified, see Section 2.4). These areas (except for Corbal 1) are included in the area registered by the National Trust as having high heritage values as natural and cultural landscapes.

Biodiversity comments

A submission by Dr. Jean-Paul Orsini indicates that the Priority Species *Grevillea cirsiifolia* occurs in Warrup.

In January 1996 the National Biodiversity Council released a statement highlighting the Greater Kingston area as one of the most important areas for biodiversity in the South-West.

Weld — *2002 Harvest Plan*

Weld is 6,700 ha in size, with 3,980 ha reserved. Of this, 3,360 ha are formally reserved. There are a further 80 ha of old growth forest in the part of Weld currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 2,650 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	1,616	246	0.04
Jarrah Woodland	106,374	52.1	27.5	24.6	77	0	0
Karri Main Belt	193,000	48.2	36.2	12.0	4,089	2,400	1.2
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	898	0	0
Rocky Outcrops	26,400	44.8	29.1	15.7	17	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
A	39,698	79.1	74.6	4.5	853	124	0.3
COb	21,839	77.2	75.3	1.9	203	139	0.6
COy1	22,876	72.4	71.6	0.8	227	26	0.1
CRb	52,753	38.6	29.7	8.9	1,738	938	1.8
CRy	33,764	33.9	24.6	9.3	40	0	0
Kb	28,345	64.4	64.3	0.1	0.5	0	0
MTb	11,817	82.6	80.8	1.8	1,186	801	6.8
MTy1	20,426	91.1	90.9	0.2	313	51	0.2
Pi	13,827	95.9	95.0	0.9	761	64	0.5
Q	14,958	87.4	80.6	6.8	67	6	0.04
S1	25,513	64.8	53.2	11.6	935	382	1.5
Vh3	12,396	72.4	66.7	5.7	373	114	0.9

Other Biodiversity Values

High biophysical naturalness (2,710 ha in total)

Level of reservation: 98% (88% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

Refugia

Level of reservation: 97% (92% formal)

Amount not reserved: 1 ha[1] Increase in reservation: <0.01%

[1] This may be an artifact of the grid system used by the Forest Management Information System.

Threatened Fauna

There is one record of a Brush-tailed Phascogale (Priority Three species) occurring in Weld. There are 84 records of this species occurring in the RFA area, one of which occurred on gazetted reserved land.

Social Value and Community Attachment

High aesthetic value

Level of reservation: 64% (61% formal)

Amount not reserved: 353 ha Increase in reservation: 0.07%

Winnejup

Winnejup is 3,210 ha in size. All of Winnejup is in formal reserves, except for 3 ha. These 3 ha may be an artifact of the grid system used by the Forest Management Information System, nevertheless the conservation values of these 3 ha are presented for completeness.

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah North East	717,100	16.8	13.9	2.9	703	0	0
Jarrah South	557,300	47.2	41.0	6.2	2,377	3	<0.01
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	55	0	0
Wandoo Forest	363,200	18.1	15.3	2.8	71	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	351	0	0
CB	6,137	46.2	33.2	13.0	97	0	0
CC1	27,443	19.6	10.5	9.1	46	0	0
CC2	13,054	54.0	50.6	3.4	402	0	0
CL2	26,357	52.3	47.0	5.3	1,342	1	<0.01
CO2	3,813	33.1	30.6	2.5	75	0	0
DM1	7,434	11.5	10.5	1.0	234	0	0
GR	22,047	15.6	8.7	6.9	15	0	0
NWg1	20,694	4.2	4.1	0.1	507	0	0
YR	19,259	29.3	13.5	15.8	137	2	0.01

Other Biodiversity Values

Threatened Fauna

There are records of four Threatened Fauna in Winnejup.

Species	Status	No. records in Winnejup	No. records in RFA area	No. records from reserved land
Red-tailed Black Cockatoo	Priority Three	1	177	5
Numbat	Rare or likely to become extinct & vulnerable	5	140	3
Quenda	Priority Four & conservation dependent	3	162	3
Woylie	Priority Four & conservation dependent	6	110	3

Social Values and Community Attachment

Extensive community attachment to the Greater Kingston Forest area, which includes Winnejup, is evident. The Friends of the Greater Kingston Forest (GKF) was formed in 1994, in response to extensive logging beginning in the area in 1994. The Friends of GKF and the WAFA have campaigned extensively against logging in any blocks in the Greater Kingston Forest. As all of Winnejup (except for 3 ha of forest) is now reserved, the social values of Winnejup are protected.

Winnejup was the subject of a meeting in 2001 between stakeholders and Government Ministers. No further information is available.

Yardup

Yardup is 4,750 ha in size, of which 320 ha are informally reserved.

Area being assessed: 4,430 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Amount of ecosystem in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,644	4,430	0.8
Jarrah Woodland	106,374	52.1	27.5	24.6	11	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	92	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Amount of complex in block (ha)	Amount not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE2	45,828	36.3	32.8	3.5	2,003	1,999	4.4
CL2	26,357	52.3	47.0	5.3	899	890	3.4
CO2	3,813	33.1	30.6	2.5	166	166	4.4
PM2	3,741	8.8	0	8.8	698	577	15.4
WH2	6,444	17.8	1.4	16.4	13	12	0.2
WH3	4,766	36.5	26.9	9.6	11	8	0.2
YN2	6,744	25.0	1.3	23.7	570	444	6.6
YR	19,259	29.3	13.5	15.8	386	333	1.7

Other Biodiversity Values

Threatened Fauna

There are records of six Threatened Fauna occurring in Yardup.

Species	Status	No. records in Yardup	No. records in RFA area	No. records from reserved land
Brush-tailed Phascogale	Priority Three	2	84	1
Numbat	Rare or likely to become extinct & vulnerable	1	140	3
Quenda	Priority Four & conservation dependent	1	162	3
Quokka	Rare or likely to become extinct & vulnerable	1	126	4
Western Brush Wallaby	Priority Four & conservation dependent	1	99	0
Woylie	Priority Four & conservation dependent	1	110	3

Social Values and Community Attachment

There are no such values associated with Yardup.

Yornup *2002 Harvest Plan*

Yornup is 4,850 ha in size, of which 950 ha are informally reserved. There are a further 20 ha of old growth forest in the part of Yornup currently intended to remain State forest available for multiple use which will be protected through the exclusion of timber harvesting operations.

Area being assessed: 3,860 ha

Forest Ecosystems

Ecosystem	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
Jarrah South	557,300	47.2	41.0	6.2	4,350	3,858	0.7
Jarrah Woodland	106,374	52.1	27.5	24.6	145	0	0
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	332	0	0
Swamps	15,300	42.8	40.0	2.8	2	0	0

Vegetation Complexes

Complex	Pre-1750 extent (ha)	Reservation level (%)			Total amount present in block (ha)	Amount in block not reserved (ha)	% increase in reservation level
		Total	Formal	Informal			
BE1	76,781	16.8	9.2	7.6	1,394	1,294	1.7
BL	59,446	5.5	3.3	2.2	11	11	0.02
CC1	27,443	19.6	10.5	9.1	319	234	0.9
CL1	15,179	22.1	9.9	12.2	817	668	4.4
CO1	5,105	21.0	14.0	7.0	243	208	4.1
GR	22,047	15.6	8.7	6.9	64	57	0.3
MT1	3,196	13.7	8.3	5.4	739	673	21.1
Q	14,958	87.4	80.6	6.8	81	28	0.2
YN2	6,744	25	1.3	23.7	70	35	0.5
YR	19,259	29.3	13.5	15.8	1,088	650	3.4

Other Biodiversity Values

Declared Rare and Priority Flora

The Declared Rare species, *Caladinia christineae*, occurs in Yornup. There are 26 known populations of this species, some of which occur outside the Regional Forest Agreement area. Currently, 19.2% of these populations occur on land that is reserved. Formally reserving the populations in Yornup would increase this by 7.7%. The population in Yornup is currently protected through the exclusion of operations during timber harvesting.

Threatened Fauna

There are five records of the Red-tailed Black Cockatoo (Priority Three) occurring in Yornup. There are 177 records of this species occurring in the RFA area, five of which occur on gazetted reserved land.

Social Value and Community Attachment

The local community conservation group, Bridgetown Greenbushes Friends of the Forests, has campaigned on behalf of Yornup since their formation in 1987 (although much of their focus has been on Dalgarup over this time). The group provided a brief submission on Yornup which argued for the high value the block has to the local community because of its beauty and integrity.

Biodiversity comments

Locals have indicated that there is a breeding population of cockatoos in the block and CLM have recognised that this population requires protection.

The Bridgetown-Greenbushes Friends of the Forest Group argue that Numbats may occur in the area, although they do not know if they occur in the block (unverified, see Section 2.4).

4.0 Summary of Conservation Values

A Review of High Conservation Values in Western Australia's South-West Forests

The total amount of each value present across all the blocks included in this assessment for forest ecosystems, vegetation complexes, other biodiversity features and social values and community attachment (aesthetic value) are presented (Table 2).

This summarises the total amount of each value not reserved across all the blocks included in this assessment (community attachment and social values, apart from high aesthetic value, could not be summarised in this way). This summary is broken into the total amount of the value in the blocks on the 2002 Harvest Plan (assessed in the interim report), the total amount of the value in the remaining blocks (including those in the four general areas) and then the total amount across all 106 blocks and the four general areas. The reservation level of the forest ecosystems and vegetation complexes is calculated as a percentage of their pre-1750 extent, for the other biodiversity values their reservation level is calculated as a percentage of their current extent (ha), except for Declared Rare Flora and Threatened Fauna (for which the data takes the form of number of populations and records of occurrence, respectively). The blocks in which these values are found is shown in the last column (using the Block code from Appendix 2).

Table 2: Total amount of conservation value across all the blocks included in assessment.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Forest Ecosystems									
Darling Scarp	29,000	7.8	7.6	0.2	20	16	36	0.1	30, 57, 69, 83
Jarrah Blackwood	347,200	31.2	23.9	7.3	5,399	57,596	62,995	18.1	Half blocks in South West area & 75, 83, 84, 88, 108
Jarrah Leeuwin	56,400	15.3	14.7	0.6	Not present	662	662	1.2	43, 45, 49
Jarrah North East	717,100	16.8	13.9	2.9	723	60,933	61,656	8.6	Most blocks in Swan & 31, 32, 39, 50, 56, 67, 82, 111, 115
Jarrah North West	670,600	19.3	13.9	5.4	31,291	44,901	76,192	11.4	Most blocks in Swan & 30, 31, 37, 39, 50, 51, 53, 54, 57, 58, 60, 63, 65,
Jarrah Red Tingle	350	64.9	64.9	0	Not present	0	0	0	110
Jarrah Sandy	107,900	26.1	22.9	3.2	1,904	7,383	9,287	8.6	6, 7, 10, 11, 12, 20, 21, 22, 37, 51, 52, 54, 57, 63
Jarrah South	557,300	47.2	41.0	6.2	36,570	33,389	69,959	12.6	41, 59 & most blocks in Warren
Jarrah Unicup	81,000	20.0	20.0	0	31	0	31	0.04	74, 102, 107
Jarrah Woodland	106,374	52.1	27.5	24.6	0	0	0	0	Almost all blocks
Jarrah Yellow Tingle	11,600	75.2	75.2	0	Not present	0	0	0	110
Karri Main Belt	193,000	48.2	36.2	12.0	30,817	9,746	40,563	21.0	41, 59, & most blocks in Warren
Karri Red Tingle	7,200	72.4	72.4	0	Not present	0	0	0	110
Karri West Coast	14,500	30.8	30.7	0.1	Not present	123	123	0.8	40, 43, 45, 49, 64
Karri Yellow Tingle	15,800	75.4	75.4	0	Not present	0	0	0	110
Peppermint & Coastal Heath	80,100	72.5	72.3	0.2	0	0	0	0	76, 79, 80, 112
Rocky Outcrops	26,400	44.8	29.1	15.7	0	0	0	0	Most blocks
Shrub, Herb & Sedgelands	429,900	59.3	51.8	7.5	0	0	0	0	Most blocks
Swamps	15,300	42.8	40.0	2.8	0	0	0	0	12, 17, 21, 24, 28, 29, 40, 47, 48, 49, 55, 64, 74, 100, 107, 117
Swan Coastal Plain[1]	n.d.	n.d.	n.d.	n.d.	Not present	0	0	0	48

[1] This ecosystem occurs mainly outside the RFA boundaries, and therefore, data on amount of ecosystem reserved is not available.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Wandoo Forest	363,200	18.1	15.3	2.8	36	24,277	24,313	6.7	Most blocks in Swan & 31, 32, 39, 50, 52, 54, 56, 63, 65, 67, 77, 82, 89, 111, 113, 115
Wandoo Woodland	163,000	23.8	19.0	4.8	4	7,655	7,659	4.7	Most blocks in Swan & 31, 32, 39, 52, 54, 56, 67, 77, 82, 89, 111, 113
Vegetation Complexes									
A	39,698	79.1	74.6	4.5	512	229	741	1.9	70, 78-80, 83, 84, 86-88, 91, 92, 93, 96, 97, 100, 101, 104, 107, 109, 110,112, 114
Ba	1,469	54.8	1.8	53.0	Not present	43	43	2.9	33, 68, 75, 84
BD	47,785	46.8	28.4	18.4	240	4,949	5,189	10.9	29, 30, 33-36, 42, 44, 46-48, 55, 61, 62, 66, 68, 69, 88, 108
BE1	76,781	16.8	9.2	7.6	15,139	5,041	20,180	26.3	41, 59, 71, 75, 78, 83-88, 90, 92-95, 98, 99, 101, 107-109, 117
BE2	45,828	36.3	32.8	3.5	130	7,395	7,525	16.4	77, 81, 82, 89, 95, 107, 111, 113, 115, 116
BE3	13,135	80.7	80.6	0.1	Not present	0	0	0	82
BEb	5,306	55.8	42.6	13.2	925	264	1,189	22.4	73, 85, 96, 98, 101, 104, 106, 109
BEy1	27,979	68.4	60.1	8.3	4,303	2,441	6,744	24.1	71, 73, 74, 85, 96, 98, 101-104, 106, 109
BEy2	78,308	15.4	15.3	0.1	Not present	0	0	0	74
BK	21,361	63.6	51.6	12.0	Not present	2,376	2,376	11.1	29, 30, 34, 35, 42, 44, 45, 47, 49, 64, 66
BL	59,446	5.5	3.3	2.2	1,373	830	2,203	3.7	37, 41, 50, 53, 57- 60, 63, 65, 117
BLf	2,972	0.7	0.5	0.2	Not present	7	7	0.2	53
BN	2,135	5.2	1.3	3.9	Not present	189	189	8.9	30
BO	3,578	23.3	0	23.3	572	Not present	572	16.0	37, 57
BR	11,215	0.7	0.7	0	Not present	0	0	0	68, 75
BT	21,477	1.8	0.9	0.9	80	1	81	0.4	30, 41, 50, 57
BU	7,029	99.5	99.5	0	Not present	28	28	0.4	105
BWp	32,542	81.0	81.0	0	2	0	2	<0.01	80, 100

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
C1	18,982	13.5	12.3	1.2	Not present	273	273	1.4	43, 45, 49
C2	12,879	6.6	6.6	0	Not present	0	0	0	43
CA	59,511	96.9	96.9	0	Not present	0	0	0	74, 103
CB	6,137	46.2	33.2	13.0	213	832	1,045	17.0	71, 77, 82, 89, 107, 111, 113, 115
CC1	27,443	19.6	10.5	9.1	3,338	2,309	5,647	20.6	37, 41, 50, 51, 53, 54, 57-60, 115, 117
CC2	13,054	54.0	50.6	3.4	55	367	422	3.2	77, 82, 89, 107, 111, 115
CE	24,295	46.2	25.7	20.5	1,371	4,528	5,899	24.3	33-36, 44, 46-48, 55, 61, 68, 69, 75, 84, 88, 108
CI	11,005	13.8	9.4	4.4	Not present	925	925	8.4	52
CL1	15,179	22.1	9.9	12.2	2,368	118	2,486	16.4	85, 90, 92, 95, 98, 99, 107, 109, 117
CL2	26,357	52.3	47.0	5.3	3	3,170	3,173	12.0	77, 81, 82, 89, 95,111, 113, 115, 116
CM	24,527	54.1	50.2	3.9	625	26	651	2.6	71, 73, 74, 85, 96, 98, 102, 104, 106, 107
CO1	5,105	21.0	14.0	7.0	559	141	700	13.7	71, 85, 90, 92, 94, 95, 98, 99, 107, 109, 117
CO2	3,813	33.1	30.6	2.5	10	687	697	18.3	77, 81, 82, 89, 95, 107, 111, 113, 115, 116
COb	21,839	77.2	75.3	1.9	418	505	923	4.2	70, 91, 97, 100, 101, 104, 105,110, 114
COd	2,118	36.3	27.6	8.7	Not present	350	350	16.5	70, 97
COy1	22,876	72.4	71.6	9.5	62	398	460	2.0	71, 80, 97, 100, 101, 104, 105, 110, 114
COy2	2,534	80.8	80.8	0	Not present	0	0	0	74
CP	3,943	77.2	60.1	17.1	464	0	464	11.8	71, 85, 98, 101, 109
CRb	52,753	38.6	29.7	8.9	11,956	3,710	15,666	29.7	59, 70, 72, 76, 78-80, 83, 84, 86-88, 90, 92-94, 97-101, 104, 108, 109, 112, 114
CRd	1,904	45.9	39.6	6.3	143	285	428	22.5	72, 76, 83, 84, 87, 88, 91-93, 101
CRy	33,764	33.9	24.6	9.3	5,787	2,537	8,324	24.7	70, 72, 76, 78-80, 84, 86-88, 91-93, 98-101, 104, 108, 109, 114
CT	3,128	56.9	32.7	24.2	384	141	525	16.8	35, 42, 72, 76, 90, 94, 98, 99, 109
CV	2,038	64.1	63.2	0.9	Not present	6	6	0.3	68, 75

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Ce	35,311	33.3	25.4	7.9	699	5,531	6,230	17.6	2-5, 7-21, 23-28, 32
Ck	133,887	15.0	11.1	3.9	Not present	9,038	9,038	6.8	3, 11-13, 22, 25, 26, 32, 39, 56, 67
Cr	917	26.7	26.7	0	Not present	0	0	0	43
Cw1	6,144	10.1	9.8	0.3	Not present	14	14	0.2	43, 45, 49
Cw2	6,364	4.1	4.1	0	Not present	0	0	0	43
D1	208,271	14.7	10.0	4.7	15,234	16,299	31,533	15.1	1, 2, 4, 5, 9, 14-17, 19, 23, 24, 27, 28, 37, 39, 50, 51, 53, 58, 60, 63, 65
D2	86,086	22.4	19.1	3.3	1,533	7,332	8,865	10.3	2, 4, 5, 8, 10, 13-15, 18, 23, 25, 31, 39
D4	132,414	24.0	20.6	3.4	274	26,780	27,064	20.4	3-6, 8, 10, 11, 13, 14, 18, 20, 23, 25, 26, 31, 32, 39, 56, 67
DM1	7,434	11.5	10.5	1.0	Not present	0	0	0	50, 115
DM2	41,469	7.0	7.0	0	Not present	0	0	0	82, 111
DO	2,288	90.3	78.5	11.8	134	Not present	134	5.9	86, 87, 108
DP	4,088	50.3	42.8	7.5	Not present	58	58	1.4	30, 34, 35, 42, 62, 66
DS	29,108	7.8	7.6	0.2	64	16	80	0.3	30, 57, 69, 83, 88, 108
FH5	21,444	19.0	19.0	0	Not present	0	0	0	74
G	27,262	56.8	52.6	4.2	420	849	1,269	4.7	6, 7, 10-12, 20, 21, 22, 25, 37, 57
GA	1,122	17.6	11.6	6.0	0	16	16	1.4	30, 33, 37, 69, 88
GR	22,047	15.6	8.7	6.9	2,241	1,045	3,286	14.9	37, 41, 50, 51, 53, 54, 57-60, 63, 65, 115, 117
H	7,709	8.6	8.6	0	Not present	0	0	0	45
HA	5,664	18.1	18.0	0.1	Not present	0	0	0	110
HK	3,394	79.2	77.6	1.6	55	73	128	3.8	80, 84
HR	32,250	24.6	22.2	2.4	2,860	2,622	5,482	17.0	37, 50, 53, 57, 58, 60
He2	16,341	29.9	29.8	0.1	Not present	0	0	0	25
Hw	2,736	7.6	7.6	0	Not present	0	0	0	45
JA	1,528	91.1	84.4	6.7	0	6	6	0.4	75, 80, 84
JL	16,245	32.8	13.7	19.1	142	3,437	3,579	22.0	29, 30, 34-36, 42, 44, 47, 61, 62, 66
JN	4,692	59.5	43.3	16.2	Not present	604	604	12.9	38, 68, 75
KI	102,240	33.7	26.4	7.3	1,593	19,312	20,905	20.4	29, 30, 33-36, 42, 44, 46-48, 55, 61, 62, 64, 66, 68, 69, 75, 88, 108

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
KO	2,722	38.5	38.5	0	Not present	0	0	0	110
KP	1,160	21.7	5.9	15.8	Not present	5	5	0.4	95
KR	3,459	19.2	15.5	3.7	546	96	642	18.6	53, 57
KU1	1,006	24.0	24.0	0	Not present	0	0	0	50
Kb	28,345	64.4	64.3	0.1	0	85	85	0.3	97, 104, 110, 114
Ky	14,746	84.6	84.6	0	Not present	0	0	0	103, 110
LF	20,578	44.1	19.6	24.5	2,513	655	3,168	15.4	72, 75, 76, 80, 83, 84, 86-88, 92, 93, 99, 108, 109
LK1	5,224	10.2	9.4	0.8	Not present	0	0	0	50
LY	1,429	17.7	4.8	12.9	Not present	240	240	16.8	30, 34, 42, 66
Lp	14,405	98.9	98.9	0	Not present	0	0	0	103
MP	3,966	29.5	25.7	3.8	Not present	2,169	2,169	54.7	34-36, 55, 62, 66
MT1	3,196	13.7	8.3	5.4	980	1	981	30.7	90, 95, 98, 117
MT2	3,104	24.7	17.9	6.8	Not present	226	226	7.3	77, 89, 113
MTb	11,817	82.6	80.8	1.8	801	135	936	7.9	97, 105, 110, 114
Mi[1]	134,539	6.4	4.6	1.8	Not present	234	234	0.2	11, 25, 32, 56
Ms	7,714	91.1	91.1	0	Not present	0	0	0	100
Mty1	20,426	91.1	90.9	0.2	51	456	507	2.5	103-105, 110, 114
My1	68,618	36.0	26.9	9.1	337	3,803	4,140	6.0	1, 2, 9, 15-18, 24, 27, 28, 39
My2	59,317	27.3	19.7	7.6	Not present	4,562	4,562	7.7	7, 10, 12, 14, 23, 25, 31, 32, 39
N	17,800	37.8	30.5	7.3	Not present	5,338	5,338	30.0	34, 36, 40, 55, 64
Nd	2,379	57.5	52.3	5.2	Not present	452	452	19.0	55, 64
NW1	6,315	1.6	1.0	0.6	Not present	0	0	0	50
NW2	16,837	12.1	11.7	0.4	Not present	0	0	0	82, 111
NWf2	7,380	5.6	5.2	0.4	Not present	0	0	0	82
NWg1	20,694	4.2	4.1	0.1	Not present	0	0	0	50, 111, 115
Nw	8,584	45.3	29.5	15.8	Not present	1,876	1,876	21.9	36, 40, 55, 64

[1] Complex occurs mainly outside the RFA area.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
PM1	25,801	23.5	8.6	14.9	2,864	1,258	4,122	16.0	72, 76, 78, 80, 83, 84, 86, 92, 93, 99, 109, 112
PM2	3,741	8.8	0	8.8	23	577	600	16.0	90, 98, 109, 116
PR	9,768	21.5	8.8	12.7	514	1,443	1,957	20.0	44, 46-48, 61
Pi	13,827	95.9	95.0	0.9	64	8	72	0.5	96, 101, 104, 105, 109, 114
Pn	166,694	33.6	23.9	9.7	1,229	25,314	26,543	15.9	2-8, 10-14, 18-23, 25, 31, 32, 52, 54, 56, 63, 67
Q	14,958	87.4	80.6	6.8	306	262	568	3.8	70, 78-80, 84, 86-88, 97, 100, 104, 105, 110, 112, 114, 117
QN	9,071	59.2	58.4	0.8	34	72	106	1.2	71, 73, 74, 85, 96, 98, 101-103, 106, 109
QP	647	20.2	0	20.2	7	1	8	1.2	90, 94
QW	1,418	11.2	11.1	0.1	13	1	14	1.0	63, 65
S	53,656	47.3	29.1	18.2	73	5,095	5,168	9.6	2-6, 8, 10-14, 18-25, 31, 39, 52, 56, 57, 63, 67
S1	25,513	64.8	53.2	11.6	1,733	1,456	3,189	12.5	70, 71, 73, 79, 80, 91, 96-106, 109, 114
S2	21,123	39.3	36.2	3.1	326	438	764	3.6	71, 73, 74, 102, 103, 106
S3	6,226	73.1	62.1	11.0	293	164	457	7.3	70, 73, 74, 91, 96, 97, 100-106
S4	1,569	23.6	23.3	0.3	Not present	10	10	0.6	100
SK	1,812	49.2	28.8	20.4	Not present	755	755	41.7	52
SS	894	57.9	53.4	4.5	Not present	59	59	6.6	35, 42, 62
ST	2,325	52.6	7.4	45.2	65	Not present	65	2.8	90, 98, 107
Sc	3,147	4.3	3.2	1.1	Not present	68	68	2.2	75, 84
Sd	37,717	32.8	26.3	6.5	Not present	344	344	0.9	36, 38, 40, 55, 68, 75, 84
Sd2	101	85.1	85.1	0	Not present	0	0	0	84
Swd	10,382	57.3	52.2	5.1	Not present	73	73	0.7	38, 40, 55, 68, 75
T	27,829	11.3	8.8	2.5	2	4,974	4,976	17.9	44-46, 48, 49, 61
TL	27,904	32.1	24.1	8.0	1,543	3,941	5,484	19.7	29, 30, 35, 36, 42, 44, 46, 47, 61, 62, 69
TP	990	2.7	0	2.7	53	30	83	8.4	90, 94
Td	169	66.2	66.2	0	Not present	0	0	0	45

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Tw	8,723	8.0	4.5	3.5	0	1,102	1,102	12.6	44-46, 48, 49, 61
t	5,253	33.7	33.7	0	Not present	0	0	0	74, 103
UC2	3,207	72.6	72.6	0	Not present	0	0	0	74, 102
UC3	3,669	19.7	19.7	0	Not present	0	0	0	74
V1	2,285	69.7	16.3	53.4	421	49	470	20.5	72, 76, 79, 80, 91
V4	5,420	91.7	91.1	0.6	0	9	9	0.2	70, 74, 97, 103
Va2	11,006	46.9	46.9	0	Not present	0	0	0	74, 103
Va3	5,468	56.5	56.5	0	Not present	0	0	0	74, 103
Vh2	9,968	58.4	44.1	14.3	1,550	196	1,746	17.5	70, 72, 79, 80, 91, 97, 99, 100, 110
Vh3	12,396	72.4	66.7	5.7	368	229	597	4.8	70, 79, 97-99, 101, 110, 114
W1	7,296	27.9	25.3	2.6	Not present	445	445	6.1	43, 45, 49
WA	8,621	57.8	31.1	26.7	1,310	584	1,894	22.0	72, 76, 79, 80, 83, 86-88, 93, 99, 108, 112
WG	38,161	25.0	24.3	0.7	701	4,064	4,765	12.5	51, 52, 54, 63
WH1	20,321	34.7	10.9	23.8	3,215	842	4,057	20.0	41, 59, 72, 75, 78-80, 83, 84, 86-88, 92-94, 99, 108, 109, 112
WH2	6,444	17.8	1.4	16.4	553	12	565	8.8	90, 98, 109, 116
WH3	4,766	36.5	26.9	9.6	9	1,761	1,761	37.1	77, 89, 95, 111, 113, 116
WL	5,906	31.3	8.9	22.4	30	Not present	30	0.5	90
WS2	3,332	35.5	28.7	6.8	233	497	730	21.9	30, 69, 75, 83, 84, 88, 108
Wi[1]	23,486	0.2	0.1	0.1	Not present	1	1	<0.01	25
Wr	448	19.2	19.2	0	Not present	0	0	0	43
Ww1	2,268	23.3	19.6	3.7	Not present	49	49	2.2	43, 45, 49
Y5	124,375	26.8	19.6	7.2	Not present	11,697	11,697	9.4	3, 6, 7, 10-12, 21, 22, 25, 26, 56
Y6	158,390	22.1	20.7	1.4	Not present	7,835	7,835	4.9	7, 11, 12, 20-22, 25, 26
YE	8,623	39.9	36.5	3.4	Not present	0	0	0	77, 82
YEf	1,029	48.8	48.8	0	Not present	0	0	0	77, 82
YN1	23,494	35.5	14.4	21.1	2,512	910	3,422	14.6	41, 59, 75, 78, 80, 83-88, 92, 93, 98, 99, 109, 112

[1] Complex occurs mainly outside the RFA area.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
YN2	6,744	25.0	1.3	23.7	945	1,233	2,178	32.3	81, 85, 90, 95, 98, 109, 113, 116, 117
YR	19,259	29.3	13.5	15.8	856	1,401	2,257	11.7	77, 81, 89, 90, 95, 107, 111, 113, 115-117
Yg1	80,061	29.7	10.3	19.4	2,729	3,696	6,425	8.0	1, 2, 4, 9, 10, 14-17, 19, 24, 25, 27, 28, 31, 32, 39, 63, 65
Yg2	50,259	31.6	11.0	20.6	715	5,368	6,083	12.1	2, 5, 6, 9, 10, 14, 16-19, 23, 24, 28, 31, 39, 63, 65
Other Biodiversity Values									
High biophysical naturalness	653,918	98	88	10	373	481	854	0.1	11, 15, 30, 32, 33, 43, 48, 49, 52, 56, 57, 68, 70, 72, 73, 75, 76, 78, 79, 80, 84, 88, 91, 93, 97, 101, 104, 109, 112, 114,
High concentration of disjunct flora	116,283	56	51	5	2,421	1,261	3,682	3.2	1, 4, 10, 19, 25, 29, 38, 40, 68, 75
High concentration of relictual flora	151,981	68	62	6	Not present	8,958	8,958	5.9	25, 29, 38, 40, 55, 64, 68, 75, 91
High probability of flora species richness	211,437	75	69	6	1,043	34,634	35,677	16.9	29, 30, 33, 34, 35, 36, 40, 43, 44, 42, 46, 47, 48, 49, 55, 61, 62, 64, 66, 68, 75
Area of high flora endemism	221,879	64	60	4	466	11,477	11,943	5.4	12, 25, 29, 30, 38, 40, 44, 46, 47, 48, 55, 61, 62, 64, 66, 68, 74, 75, 103
Centre of fauna endemism	3,334	85	80	5	14	4	18	0.5	68, 87
Refugia	71,138	97	92	5	7	18	25	0.03	33, 68, 69, 73, 96, 104, 107, 114
Threatened Ecological Communities									
Swan Coastal Plain Ironstone Shrublands	91.4	32.9	32.9	0	Not present	22.1	22.1	24.2 already informal reserve	48
Scott River Ironstone Heaths	371.2	33.2	33.2	0	Not present	2.6	2.6	0.7 already proposed for reservation	40

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Declared Rare Flora[1]									
Boronia exilis	9	33.3	33.3	0	Not present	1	1	11.1	40
Brachysema modestum	2	0	0	0	Not present	1	1	50.0	48
Caladenia christineae	26	19.2	19.2	0	4	3	7	26.9	81, 95, 107, 117
Caldenia dorrienii	11	64.0	64.0	0	Not present	1	1	9.1	11
Caladenia harringtoniae	40	35.0	25.0	10.0	3	3	6	15.0	59, 71, 73, 81, 88, 106
Caladenia winfieldii	2	0	0	0	1	Not present	1	50.0	98
Daviesia elongata subsp. *elongata*	8	12.5	12.5	0	Not present	4	4	50.0	48
Drakaea micrantha	14	64.0	64.0	0	Not present	2	2	14.3	47
Dryandra nivea subsp. *uliginosa*	12	16.0	16.0	0	Not present	2	2	16.7	48
Dryandra squarrosa subsp. *argillacea*	9	0	0	0	Not present	1	1	11.1	48
Meziella trifida	12	75.0	75.0	0	Not present	2[2]	2	16.7	40
Verticordia fimbrilepis subsp. *fimbrilepis*	3	33.3	0	33.3	Not present	1	1	33.3	11

[1] The current extent of Declared Rare Flora (DRF) is the of number of populations in the RFA area; the current reservation level of DRF is the percentage of populations on reserved land; the amount not reserved in the blocks is the number of populations across all the blocks not on reserved land; the increase in reservation is calculated based on the total number of populations in the RFA area and represents the impact of formal reservation. All DRF populations are protected by buffer zones during timber harvesting.

[2] These two populations occur in a road reserve.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Threatened Fauna[1]									
Western Long-billed Corella	18	0			1	Not present	1	-	107
White-bellied Frog	3	0			Not present	1	1	-	49
Baudin's Cockatoo	28	1			3	2	5	-	46, 83, 87, 88, 107
Chuditch	379	17			8	24	32	-	6, 11, 25, 29, 30, 34, 43, 48, 53, 57, 58, 73, 77, 81, 85, 89, 90, 106, 107, 111, 113
Malleefowl	7	1			Not present	2	2	-	26, 46
Numbat	140	3			Not present	53	53	-	10, 20, 77, 81, 89, 95, 111, 113, 115, 116
Orange-bellied Frog	1	0			Not present	1	1	-	29
Quokka	126	4			27	9	36	-	8, 29, 59, 72, 79, 86, 87, 92, 93, 103, 113, 116
Western Ringtail Possum	63	2			1	12	13	-	81, 89, 95, 107, 113
Peregrine Falcon	9	1			1	Not present	1	-	8
Black-stripe Minnow	7	5			Not present	1	1	-	40
Brush-tailed Phascogale	84	1			2	9	11	-	81, 88, 89, 95, 111, 114, 116
Red-tailed Black Cockatoo	177	5			17	21	38	-	5, 17, 77, 81, 83, 88, 89, 91, 92, 93, 95, 107, 108, 111, 113, 115, 117
Crested Shrike-tit	8	2			Not present	1	1	-	25
Quenda	162	3			5	21	26	-	8, 11, 25, 81, 83, 88, 89, 92, 93, 95, 107, 109, 113, 115, 116
Tammar Wallaby	26	0			Not present	2	2	-	81, 113
Water Rat	7	0			1	Not present	1	-	86

[1] The current extent of Threatened Fauna is the number of records of occurrence from the RFA area; reservation level of TF is the number of records of occurrence from land that is reserved; the amount not reserved is the number of records of occurrence in the State forest part of the block; the percentage increase in reservation is not calculable.

Value	Pre-1750 extent (ha)	Reservation level (%)			Amount of value not reserved in blocks on 2002 Harvest Plans (ha)	Amount of value not reserved in remaining blocks (ha)	Total amount of value not reserved in all blocks (ha)	Total % increase in reservation level if all area of value reserved	Block(s) where value occurs (see Appendix Two explanation of number code)
		Total	Formal	Informal					
Western Brush Wallaby	99	0			7	19	26	-	74, 89, 103, 107, 111, 113, 116
Western False Pipistrelle	36	11			Not present	1	1	-	84
Woylie	110	3			2	52	54	-	1, 9, 18, 21, 23, 26, 39, 77, 83, 89, 95, 113, 115, 116
Social Values and Community Attachment									
High aesthetic value	517,268	64	61	3	2,048	10,158	12,206	2.4	2, 7, 10, 12, 17, 20, 21, 22, 24, 25, 27, 28, 30, 34, 39, 41, 42, 43, 44, 57-59, 62, 64, 65, 66, 67, 68, 72, 75, 76, 79, 80, 83, 85, 86, 88, 91, 93, 97, 100, 104, 105, 108, 112, 114

5.0 Sensitivity to Disturbance

Part of this assessment was to examine the sensitivity to disturbance of the values identified in each block. The time limitations for this report have prevented a thorough analysis for each value. Furthermore, for many of the values identified information on their sensitivity to disturbance is not available. Where possible the sensitivity to disturbance is discussed, albeit in general terms for some values.

The primary activities that may lead to disturbance in forest areas are: mining, logging, fire, disease, insect pests, infrastucture corridors (including roads), weeds, feral animals, some forms of recreational pursuits, wildflower picking, flooding from reservoirs, seed collecting, and beekeeping. The impact of any activity depends on many factors: the scale, the intensity, the periodicity, the permanence of any effects and the resilience of the ecosystem to this change. Not all disturbance is bad and some plants and animals require periodic disturbance for their very survival. For example, some Declared Rare Flora are disturbance opportunists and can be disfavoured by the conservative management regimes used within reserves, early successional plants are favoured by disturbance, and Tammar Wallabies require periodic disturbance by hot fires to regenerate the thickets on which they depend. Equally though, for other species inappropriate or too frequent disturbance can lead to their decline and even extinction. Therefore, a flexible approach to forest management which recognises different species responses to disturbance is required.

5.1 Effects of Disturbance on Biodiversity Values

Forest Ecosystems and Vegetation Complexes

Disturbance is an integral part of all forest ecosystems and the alteration of forest structure and species composition is a function of disturbance. Within the South-West forests, the following key disturbances have been identified (Lamont *et al*., 1997):

- Logging,
- Fire,
- Disease – particularly that caused by *Phytophthora cinnamomi*, a root pathogen,
- Weeds, and
- Mining.

Each of these disturbances is either a direct consequence of human settlement (e.g. logging, mining, weeds, *Phytophthora*) or has changed since humans have settled the South-West region (e.g. fire, other pathogens). These modern human-related disturbances require more attention in terms of their impacts as they are not part of the evolutionary history of the South West vegetation (Commonwealth and Western Australian Governments RFA Steering Committee, 1998b). In general, these disturbances can cause major changes in species composition, loss of biological components such as pollinators and decomposers that form a critical part of ecosystems, and the degradation of ecosystem processes such as nutrient

and water cycles, soil formation and energy flows (Independent Expert Advisory Group, 1997).

The sensitivity of forests in the South-West to the above disturbances varies depending on species composition, climate regimes (particularly rainfall), human efforts to mitigate the disturbance, as well as the regime of the disturbance itself. For example, forests dominated by Jarrah are more susceptible to *Phytophthora* than forests dominated by Karri. Also, fire frequency tends to be higher in lower rainfall zones (Commonwealth and Western Australian RFA Steering Committee, 1998b), resulting in different impacts of fire in different areas. Given the complex interaction between different types of disturbance and factors which affect the sensitivity of forests to disturbance, and the immensity of this topic, it was not possible to fully detail the sensitivity of forest ecosystems and vegetation complexes to disturbance in this report.

Flora values

Information of the sensitivity to disturbance of Declared Rare Flora is drawn from Safstrom and Lemson (1997).

Boronia exilis Family: Rutaceae
Not reviewed by Safstrom and Lemson (1997).

Brachysema modesta Family: Leguminosae
Resprouts following fire, unknown response to soil disturbance – may be killed. Presumed to not be susceptible to *Phytophthora*.
Threats to species include: Logging (pine harvesting), firebreaks, weeds, recreation and roadworks.
Remedial actions: none listed.

Caladenia christineae Family: Orchidaceae
Killed by fire, unknown response to soil disturbance – may be killed. Not thought to be susceptible to *Phytophthora*.
Threats to the species include: weed invasion and roadworks.
Remedial actions: none listed.

Caladenia dorrienii Family; Orchidaceae
Can be killed by fire, summer fires stimulate flowering. Not thought to be susceptible to *Phytophthora*. Response to soil disturbance is unknown.
Threats to species include: prescribed burns, grazing, recreation, clearing, firebreaks, insects, weeds and roadworks.
Remedial actions: none listed.

Caladenia harringtoniae Family: Orchidaceae
Can be killed by fire, summer fires stimulate flowering. Not thought to be susceptible to *Phytophthora*. Response to soil disturbance is unknown.
Threats to species include: prescribed burns, mining, clearing, wild horses and roadworks.
Remedial actions: none listed.

Caladenia winfieldii Family: Orchidaceae

Killed by fire, response to soil disturbance is unknown. Susceptibility to *Phytophthora* is unknown.

Threats to species include: inappropriate fire regimes, logging (through changes to hydrology), removal of overstorey from dieback, digging by pigs, kangaroo grazing. Remedial actions: control of feral pigs, fencing, defer further timber extraction, implement disease control, preserve genetic diversity.

Daviesia elongata subsp. *elongata* Family: Leguminosae

Not reviewed by Safstrom and Lemson (1997).

Drakaea micrantha Family: Orchidaceae

Not reviewed by Safstrom and Lemson (1997).

Dryandra nivea subsp. *uliginosa* Family: Proteaceae

Killed by fire, but reseeds. Response to soil disturbance is not known – possibly killed. Highly susceptible to *Phyotphthora*.

Threats to species include: Prescribed burning or burning of any form, mining, dieback, cattle grazing, firebreaks, insects which eat fruits, weeds, road works, and heavy grazing by native animals.

Remedial actions: none listed.

Dryandra squarrosa subsp. *argillacea* Family: Proteaceae

Not reviewed by Safstrom and Lemson (1997).

Meziella trifida Family: Haloragaceae

Response to fire and soil disturbance unknown.

Threats to species include: fire, logging and recreation.

Remedial actions: none listed.

Verticordia fimbrilepis subsp. *fimbrilepis* Family: Myrtaceae

Not reviewed by Safstrom and Lemson (1997), however they did include *V. fimbrilepis* subsp. *australis* which is presumed to be susceptible to *Phytophthora* and resprouts from fire. Mining, recreation, weeds and roadworks are also considered to be threats to V. australis.

As recently as 1996 new vascular plant species were still being discovered and described in the South-West forests (Hopper and Brown (in review) in Calver *et al*., 1996). This suggests that the flora inventory from the region is incomplete, and therefore, so may be our knowledge of rare flora in the region and the forest blocks and areas included in this assessment.

The sensitivity of other flora values, such as areas of high flora endemism, flora disjunctiveness, relictual flora, and flora species richness to disturbance could not be assessed in this report because of a lack of time and information.

Threatened Fauna

The information presented below on the sensitivity of Threatened Fauna to disturbance is drawn mainly from a report prepared for the RFA (Christensen, 1997), The Mammals of Australia (Strahan, 1995) and The Atlas of Australian Birds (Blakers *et al.*, 1984).

Mammals	
Brush-tailed Phascogale *Phascogale tapoatafa*	Timber harvesting a potential threat, if trees with hollows are not retained (Christensen, 1997). Range considerably reduced through clearing for agriculture, resulting in small, isolated populations. Low population densities and annual male die-off make the species vulnerable to localised extinctions (Strahan, 1995).
Chuditch *Dasyurus geoffroii*	Timber harvesting and fire are unlikely to be significant threats (Christensen, 1997) Long-term survival will depend on sympathetic silvicultural practices and burning regimes, and protecting remaining natural habitats (Strahan, 1995).
Numbat *Myrmecobus fasciatus*	Strahan (1995) indicates that foxes are currently the main threat.
Quenda *Isoodon obeselus*	Fire and timber harvesting are temporary disturbances from which populations can rapidly recover (Christensen, 1997). Individuals require home ranges up to 7 ha in size. Vegetation clearance for agriculture, loss of dense vegetation, and reduction in frequency of small-scale fires have all contributed to its reduced range (Strahan, 1995).
Quokka *Setonix brachyurus*	Foxes are the main threat to Quokka. Quokkas tend to occur in thickets along tributaries of rivers, which are within the informal reserve system. Special precautions are needed to protect its swamp habitat and prevent fox predation in timber harvest areas (Christensen, 1997).
Tammar Wallaby *Macropus eugenii*	Fire regenerated thickets provide useful protection against foxes (Christensen, 1997). Clearing of land for agriculture has severely reduced its range (Strahan, 1995).
Water Rat *Hydromys chrysogaster*	Threats are largely unknown, but most likely to be from foxes and cats (Christensen, 1997). Young preyed upon by snakes and large fishes, adults and young by birds of prey and cats (Strahan, 1995).
Western Brush Wallaby *Macropus irma*	Timber harvesting does not appear to be a threat (Christensen, 1997). Young are susceptible to fox predation (Strahan, 1995; Christensen, 1997).
Western False Pipistrelle *Falsistrellus mackenziei*	Timber harvesting could lead to loss of roosting sites (Strahan, 1995).

Western Ringtail Possum *Pseudocheirus peregrinus occidentalis*	Timber harvesting may have an impact in some areas. Particularly vulnerable to timber harvesting because of requirement for hollows and small home range. However, current safeguards are considered adequate (Christensen, 1997). Fox predation implicated in decline of species in open inland forests (Strahan, 1995).
Woylie *Bettongia penicillata*	Timber harvesting does not appear to be a threat if guidelines are adhered to. Fire not a threat, if accompanied by fox control (Christensen, 1997). Fox predation is the main threat in forest areas, otherwise loss of habitat through clearing for agriculture main threat (Strahan, 1995).
Birds	
Baudin's Cockatoo *Calyptorhynchus baudinii*	Potentially vulnerable to timber harvesting because uses large trees with hollows for nesting. However, current safeguards, which retain habitat trees and potential habitat trees, and the current reserve system, are considered adequate (Christensen, 1997). Clearing has removed much of the heath flora the species relies on (Blakers *et al*., 1984).
Crested Shrike-tit *Falcunculus frontatus leucogaster*	Timber harvesting unlikely to pose a threat (Christensen, 1997).
Mallefowl *Leipoa ocellata*	Fox is the main threat and loss of habitat through clearing. Prescribed burning may be a problem in certain instances (Christensen, 1997). Grazing by sheep and rabbits in uncleared mallee reduces food resource and clearing removes litter needed to build nesting mounds (Blakers *et al*., 1984)
Peregrine Falcon *Falco peregrinus*	Uncommon in forest areas, therefore unlikely to be threatened by timber harvesting (Christensen, 1997).
Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	Forest clearing and timber harvesting are threats, if large trees with large hollows are not retained (Christensen, 1997). Up to 20% of hollows may be colonised by the introduced honeybee and many apparently 'good' hollows are not suitable (too shallow, full of water etc) preventing their use by cockatoos. Very selective in which trees they feed on (prefer trees with lots of large fruits) (Ron Johnstone, WA Museum, *pers comm*.)
Western Long-billed Corella *Cacatua pastinator pastinator*	Not a forest species, and timber harvesting is unlikely to cause problems (Christensen, 1997). Main threat in WA is persecution by farmers who perceive the bird to be a pest (Blakers *et al*., 1984).

Fish	
Black-stripe Minnow *Galaxiella nigrostriatus*	Mostly found within non-forested areas (coastal streams and swamps) (Christensen, 1997).
Western Mud Minnow *Galaxiella munda*	Habitat (streams, semi permanent pools and roadside ditches in southern forests) unlikely to be affected by timber harvesting with current restrictions (Christensen, 1997).
Frogs	
Orange-bellied Frog *Geocrinia vitellina*	Christensen (1997) provides no information on sensitivity to disturbance – although he notes that no logging is planned to occur in area where occur.
White-bellied Frog *Geocrinia alba*	Main threats are grazing, trampling and clearing for agriculture (Christensen, 1997). May have slow recovery from disturbance because of its low fecundity. Fire may be a threat, and following fire populations may not stabilise for up to 4 years (Pauli, 1999).

There has been considerable debate recently as to whether there is enough information to accurately assess the impacts of timber harvesting on forest fauna. Christensen (1997) indicates that current timber harvesting practices have either little or only a temporary impact from which species quickly recover, or that current safeguards are sufficient to protect species from long-term impacts. Similarly, Abbott and Christensen (1994) suggest that the lack of species extinctions and survival of species that are rare or extinct elsewhere in areas where there is periodic logging and prescribed burning indicates that these activities have little or no negative impacts on fauna in the South-West. In contrast, Calver *et al*. (1996) argue that the long time lag between habitat alteration and the loss of species means that the impacts of logging and prescribed burning on fauna survival in the South-West forests may not be evident for some time. It has also been argued that the information on the distribution of most forest fauna available is insufficient to be able to detect changes in their status or the effects of disturbance (Calver *et al.*, 1996) and that few published studies have examined the long-term effects of logging on animals (Calver *et al.*, 1998).

The faunal records used in this assessment came from a regional fauna database, compiled for the RFA (Commonwealth and Western Australian RFA Steering Committee, 1998b). Although this database includes information on 286 selected vertebrate taxa and 610 selected invertebrate taxa, it contains very little data from systematic formal and comprehensive faunal surveys. Furthermore, there are substantial gaps in scientific knowledge about the distribution and ecology of aquatic fauna, herpatofauna and invertebrates (despite the seemingly high number, they have received comparatively little study and are considered to be one of the most speciose groups in the South-West), as well as fungi in the South-West forests. For example, there are few or no published studies on the effects of logging on reptiles, frogs or fish (Christensen, 1997) and the taxonomy, distribution and ecology of aquatic invertebrates is poorly understood (Commonwealth and Western Australian RFA Steering Committee, 1998b). This lack of information and the ongoing debate as to the effect of timber harvesting, suggest that for some Threatened Fauna at least, the above table may represent a conservative estimate of processes that may affect them and their sensitivity to these processes. Finally, since there may be fauna

in the South-West that are not yet recognised, the above table and this assessment may not even document all the Threatened Fauna that occur in the forest blocks included in this assessment.

Biophysical Naturalness

Biophysical naturalness is likely to be very sensitive to disturbance, particularly mining, timber harvesting and disease. These will remove many of the biophysical values attributed to the area.

5.2 Effects of Disturbance on Social Values and Community Attachment

Social Values and Community Attachment may be sensitive to human-related disturbance rather than natural disturbance. Human-related disturbance of a block, or particular area of forest, that a community has an attachment may alter the value they place on it, as the values that created the attachment may have changed. If the disturbance is significant and involves changes to large areas of forest, then the level of community attachment may decline substantially. Similarly, aesthetic values may also be reduced by disturbance, particularly timber harvesting, mining, disease and fire.

A report on mechanisms in place in Western Australia to protect National Estate cultural heritage values prior to the RFA found that many values had not yet been adequately identified and assessed, and therefore, could not be adequately protected (O'Connor, 1998). The RFA made a commitment to "assess cultural heritage resources and develop databases and integrate the conservation of cultural heritage values into the forest management and planning process" (Commonwealth and Western Australian RFA Steering Committee, 1998b). Therefore, although cultural and heritage may be sensitive to disturbance, they should be placed at little risk.

5.3 Mechanisms of Protection from Disturbance other than Formal Reservation

As part of its review of high conservation values in the forest blocks, the Government is to consider what means of protection are available to it, other than formal reservation. The Government will undertake this process separately to this report, however a brief indication of other means of protection for the conservation values considered in this assessment is presented here. This is not a comprehensive list and the Manual of Management Guidelines for Timber Harvesting in Western Australia and Code of Practice for Timber Harvesting in Western Australia would contribute more mechanisms to the following list.

Most of these other means of protection already occur as part of the management of the State forest and the Conservation Estate and are often used in combination, with several mechanisms in use during the one operation.

Conservation value	Mechanisms of protection other than reservation
Forest ecosystem	1,2,4,5,6,7,8,9,10,11,12
Vegetation complex	1,2,4,5,6,7,8,9,10,11,12
High biophysical naturalness	2,5,6,8,9,10,11,12
High concentration of disjunct flora	1,2,4,5,6,7,8,9,10,11,12
High concentration of relictual flora	1,2,4,5,6,7,8,9,10,11,12
High probability of flora species richness	1,2,4,5,6,7,8,9,10,11,12
Area of high flora endemism	1,2,4,5,6,7,8,9,10,11,12
Centre of fauna endemism	1,2,3,4,8,9,10,11,12
Refugia	1,2,3,4,8,9,10,11,12
Threatened Ecological Communities	1,2,4,5,6,7,8,9,10,11,12
Declared Rare and Priority Flora	1,2,4,5,6,7,8,9,10,11,12
Threatened Fauna	2,3,4,8,9,10,11,12
*Corridors and Linkages*s	1,2,3,8,9,10,11,12
High aesthetic value	1,2,5,6,8,9,10,11,12
Bibbulmun track	1,2,8,9,10,11,12
Community attachment	1,2,3,6,8,9,10,11,12

Mechanism	Explanation
1	Survey and exclude the specific area of value from operational activities
2	Don't approve the operation in the Block
3	Implement feral animal control
4	Prepare and implement fauna species recovery plans
5	Prevent spread of weeds during operations
6	Control existing weed problem areas and any new infestations
7	Prepare and implement flora species recovery plans and district/region flora management plans
8	Increase rotation period between operations to allow recovery from any negative impacts
9	Carry out prescribed burning at different times and intervals and intensities
10	Prevent and rapidly control wildfires
11	Control spread of dieback disease
12	Implement a high standard of hygiene during all operations

6.0 Other Issues

A Review of High Conservation Values in Western Australia's South-West Forests

6.1 Wandoo Forest

Submissions by the Kings Park and Botanic Gardens, and the Royal Society of Western Australia on the RFA in 1998 suggested that by lumping together all Wandoo areas into two ecosystems (Forests and Woodlands) there had been a failure to recognise the floristic diversity of Wandoo vegetation. Therefore, although Wandoo Forests and Wandoo Woodlands are both reserved at >15% of their pre-1750 extent, if these two ecosystems do no capture the full range of biodiversity in the Wandoo belt then aspects of Wandoo biodiversity may not be adequately reserved (i.e. their reservation level may fall below the 15% target). More detailed analysis of the Wandoo Forest and Woodland ecosystems may be required to determine whether these two ecosystems require further splitting.

The WAFA has called for the reservation of *all* remaining areas of Wandoo Forest and Woodland in State forest. This is because, in their view, Wandoo has been severely reduced in extent from its pre-1750 distribution across the South-West region. Prior to European settlement, Wandoo was extensive over areas to the east of the current RFA boundary. Clearing of land for agriculture removed much of this Wandoo forest and woodland. The WAFA believe therefore that it is inappropriate to set the reservation level of Wandoo Forest and Woodland on the basis of their distribution over just the RFA area prior to 1750. Furthermore, they argue, the severe reduction of Wandoo from its distribution over the entire South-West region places Wandoo Forest and Woodland in the vulnerable ecosystem category. Vulnerable ecosystems are those which have been reduced in extent by 70% within a bioregional context and are subject to threatening processes, or have not been depleted but are subject to threatening processes. The JANIS target for the reservation of vulnerable ecosystems is 60%. Currently, there is 18.1% (15.3% formal) of Wandoo Forest reserved and 23.8% (23.6% formal) of Wandoo Woodlands reserved (a total of 104,000 ha out of 219,000 ha extant on land vested in the Conservation Commission). There are another 54,000 ha of Wandoo on other public land and 60,000 ha on private land which is outside reserves.

Over 50% of the Wandoo Forest and Woodland around Mundaring (taken as the area between the Brookton and Great Eastern Highways) is reserved, much of which is formally reserved. All old-growth Wandoo is also reserved (*c*. 4,400 ha). This reservation level exceeds the JANIS 15% target, although c. 19,000 ha of Wandoo Forest and Woodland in the area is not in reservation. Because Wandoo tends to occur primarily in gullies and on ridges around Mundaring, producing an additional consolidated area for formal reservation would need to include large areas of Jarrah forest, especially in the western part of the catchment.

6.2 Corridors

An important criteria included in this assessment, albeit a difficult one to quantify, was areas which have special significance as linkages and corridors.

Corridors and linkages act as conduits for the transfer of (usually) wildlife between habitat areas, increasing the genetic pool available to the species and providing access to resources that may be limited in another area. Corridors have a clear role in landscapes that have been extensively cleared of native vegetation, however their role in more forested landscapes will vary depending on the extensiveness of the area reserved and the spatial distribution of reserves. For example, within the Warren sub-region corridors occur within a predominantly forest matrix of differing species, structures and age classes and therefore may function differently to more agricultural areas, such as in the South-West sub-region, where reserves tend to occur within a matrix of farmland and forest.

The value of a corridor in biological terms is dependent on its location and its management regime rather than its tenure. The value of all areas as corridors will be dependent on their structure, age class distribution, species composition, vegetation complexes, disease status, the various management regimes that are then applied and the degree to which they link areas of native habitat. While it is often assumed that more mature forests that have a complex structure and fewer disturbances will have greater value as biological corridors, this is not necessarily always the case. For example, recently disturbed areas provide habitat for species that are favoured by early successional conditions.

Nevertheless, the more valuable corridors are likely to be the unmined, unlogged, older, more structured, moister and more fertile patches located adjacent to rivers, wetlands and streams. Many such areas have been designated and managed as informal reserves for many years, i.e. since the 1970s in the southern forests and some of these informal reserves surrounded by State forest may provide adequate corridors between formal reserves. However, other informal reserves tend to be spatially patchy and irregular and do not link well with formal reserves. Animals (e.g. small mammals) which will not leave the protective cover of the canopy may be unable to utilise such corridors. However, rather than changing the status of informally reserved corridors to formal, appropriate design and management will provide the best balance between the functionality and useability of corridors and the necessary practicalities of reserve design and management.

Ecoscape identified a number of blocks, or parts of blocks, that had the potential to act as corridors between existing reserves or between reserves and other areas of significance (e.g. Lake Muir). A more detailed process is now required to determine whether these areas could function as corridors and if so, to demarcate their boundaries. Areas identified as having the potential to act as corridors could be managed in various ways, including:

- Retain the area as State forest available for mineral and/or timber production, and direct CLM to manage the area more conservatively (longer rotations, fewer thinning operations, irregular intervals between prescribed burns and planned variation in season and intensity of burns, protection from high intensity wildfire) to retain some of its corridor attributes;
- Manage these areas of State forest as informal reserves, which excludes timber cutting and may exclude mining;

- Alter the tenure from State forest to National Park, Conservation Park or Nature Reserve; or
- Maintain current practice and tenure.

6.3 Other Public Land and the Reserve System

There are two forest ecosystems that occur within the RFA area that currently have <15% of their pre-1750 extent in reserves (Darling Scarp, and Karri South Coast – which may be discounted because it occurs mostly outside the study area). A further five ecosystems occur at levels within a few percent of this target (Table 3). There is considerably more of the Darling Scarp ecosystem on other public lands and private lands than on unreserved land vested in the Conservation Commission, because where it occurs on Conservation Commission land most of the ecosystem has already been reserved.

Table 3: Total amount of seven ecosystems with <15% (or within a few percent of this target) pre-1750 extent reserved in the forest blocks included in this assessment, other public lands and private land.

Ecosystem	Amount of ecosystem unreserved in blocks (ha) (% incr. reservation)	Amount of ecosystem on other public land (ha) (% incr. reservation)	Amount of ecosystem on private land (ha) (% incr. reservation)
Darling Scarp	36 (0.1)	1,160 (4.0)	6,511 (22.5)
Jarrah Leeuwin	662 (1.2)	1,755 (3.1)	9,185 (16.3)
Jarrah Mt Lindesay	0	3,671 (2.9)	11,889 (9.4)
Jarrah North East	61,656 (8.6)	153,505 (21.4)	76,229 (10.6)
Jarrah North West	76,188 (11.4)	321,785 (48.0)	48,334 (7.2)
Karri South Coast[1]	0	201 (1.1)	7,000 (37.8)
Wandoo Forest	24,310 (6.7)	41,196 (11.3)	39,526 (10.9)

[1] Karri South Coast has 90% of its area outside the RFA region.

A similar situation exists for some vegetation complexes. For example, the BL complex is currently reserved at 5.5%. While there are 2,000 ha of BL in the blocks and areas assessed here, there is over 10,000 ha on other public and private land. Similarly, 7.0% of the DM2 complex is reserved. All DM2 in the blocks and areas assessed is already reserved, but there is over 5,000 ha of DM2 on other public and private land. Finally, there is 8.8% of the PM2 complex reserved. While there are 600 ha of this complex in the blocks and areas reported here, there is *c*. 1,500 ha on other public and private land.

Again, for some other biodiversity values and aesthetic values there are significant areas on other public and private lands. For example, there is *c*. 51,000 ha of areas with a high concentration of disjunct flora on lands not vested in the Conservation Commission. Similarly, there is *c*. 47,000 ha of areas with a high concentration of relictual flora, *c*. 53,000 ha of areas with a high probability of flora species richness and *c*. 78,000 ha of areas with high flora endemism on lands not vested in the Conservation Commission. There are also 174,000 ha with high aesthetic value on other public and private lands. Reserving these

areas with flora and aesthetic values on other public and private land would bring the reservation level of these values to 100%.

If substantial increases in the reservation level of some of these ecosystems, complexes, other biodiversity values or aesthetic values is desired it may require the consideration of including land not vested in the Conservation Commission in the reserve system. Mechanisms for achieving this include:

- Reserving these values from other public lands;
- Purchase the private land concerned, place an embargo on any change of land use by landowner, or undertake a land swap; or
- Provide incentives to the landowner to manage these areas for conservation. For example, the "Land for Wildlife" programmes and Stewardship Agreements in which the landowner undertakes to protect and appropriately manage the land for conservation.

6.4 Climate Change

Southern Western Australia is expected to become warmer and drier over the next century. Although the level of decline in rainfall and increase in temperature is still largely uncertain, the changes are predicted to be large enough to require adaptation by all sectors of society (Conservation Commission, 2002). These changes in climate are likely to have substantial impacts on the South-West ecosystems, particularly on those elements which are restricted in their range. Furthermore, the expected rapidity of climate change may prohibit the natural process of species adaptation and speciation in response to a changed environment, creating the potential for increased species extinctions. As a consequence, it seems likely that the distribution and occurrence of some biodiversity values in the region will change from the present situation. Therefore, a comprehensive, adequate and representative conservation reserve system, with appropriate management on the multiple use estate that allows for migration, is likely to be a critical component of ensuring the continuing conservation of biodiversity values in the South-West region.

7.0 Conclusions

A Review of High Conservation Values in Western Australia's South-West Forests

This report assessed and documented the conservation values (as defined in the Terms of Reference, Appendix One) of 106 forest blocks and four general forest areas in the South-West region. 34 of those blocks, which were included on the 2002 Indicative Harvest Plan, were reported on in an earlier, interim report. The assessment of these blocks is included in this report as well so that the conservation values of all 106 blocks and the four areas can be reviewed together. The key conclusions from this report are:

- All forest ecosystems represented in the blocks assessed, with the exception of Darling Scarp and Karri South Coast, meet JANIS criteria for CAR reservation level of 15% through a combination of formal and informal reserves. There is little opportunity for significant increases to reservation of the Darling Scarp ecosystem from the public estate, while most of the Karri South Coast ecosystem occurs outside the RFA area and so the figures do not reflect its true reservation status.

- 102 of the forest blocks (including blocks in the four general areas) contained some to many conservation values. The very small parts (*c*. 10 ha) of Forest Grove, Dwalgan and Swarbrick blocks not reserved have no conservation value because these areas appear to have been cleared and are now planted in exotics or an artifact of the grid system used to store information. Because all of Poorginup block is already reserved there was no area to assess.

- Many of the 102 forest blocks that were identified as having conservation values met at least some component of the biodiversity criteria. Few blocks contained forest ecosystems with <15% reserved, although some did contain forest ecosystems less well reserved. Rather, most blocks contained a number of vegetation complexes less well reserved or other biodiversity values such as flora (e.g. disjunct flora, Declared Rare Flora) and fauna (usually Threatened Fauna) values. This data should be considered in determining the representativeness of current forest ecosystem reservation and in considering the contribution that the forest blocks assessed can make to this factor.

- The increase in the reservation level of forest ecosystems generated by adding the area in any one block containing that ecosystem was very small (usually <1%), i.e. no one block can substantially increase the reservation level of a particular ecosystem.

- Similarly, consideration of the contribution of complexes to representativeness showed the potential increase in reservation level of complexes was also small (mostly <2%), although larger increases are possible (e.g. reserving the 53 ha of the TP complex in Kinkin would increase the reservation of this complex from 2.7% to 8.1%, an increase of 5.4%). Some blocks contain vegetation complexes that currently have no areas formally reserved. For example, all areas of the PM2 complex reserved are in informal

reserves. There are 577 ha of this complex in Yardup, which could contribute 15.4% to the reservation level of the PM2 complex (increasing it from 8.8% to 24.2%).

- Again, the increase in reservation level of areas with other biodiversity values tends to be small, e.g. the increase in areas with high biophysical naturalness is generally <0.1%. However, the increase in the formal protection of Declared Rare Flora was as high as 50% for some species, if one additional population in one block is formally reserved. It should be noted that Declared Rare Flora can be reserved by mechanisms other than reservation and do have buffer zones around them during timber harvesting and other operations. Some blocks are also notable for containing a large amount of other biodiversity values. For example, in Chester there are over 2,000 ha of areas with relictual flora, high flora species richness and flora endemism.

- Information was provided to suggest that 90 of the 102 blocks identified as having conservation value had values that meet the 'Other" criteria in the Terms of Reference (Appendix One, termed Social Values and Community Attachment throughout this report). Of these, Dalgarup and the Greater Kingston blocks (Kingston, Walcott, Mersea, Dudijup, Warrup, Corbal, Dwalgan and Winnejup) clearly had the most significant level of information provided in relation to community attachment. In these blocks, members of the local community have undertaken a number of activities which demonstrates their attachment. However, not all of these blocks would contribute much to the CAR reserve system in terms of their biodiversity values. For the remaining blocks community attachment and social values ranged from inclusion by conservation groups on lists of recommended blocks for reserving (based on their biodiversity values as argued by such groups), local community use, the presence of the Bibbulmun track to containing areas of high aesthetic value. The Bibbulmun track is already protected, with informal buffer reserves along the length of the track. Adding the area with high aesthetic value in any one block to the reserve system would increase the reservation level of this value by a very small amount (usually <1%).

- The assessment of Aboriginal Heritage values for the forest blocks was severely limited by the time allowed for the study, the lack of information readily available and the focus on identifying specific areas of values. Therefore, the information presented in this report on this value should in no way be taken to represent a thorough investigation of the Aboriginal Heritage values present in the forest blocks. It should be noted that there is statutory protection of these values.

- Summing the total area of each conservation value for all the forest blocks it was present in demonstrates that, for some values, the possible increase in reservation if all areas containing a particular value are reserved could be substantial. For example, if all areas of the Jarrah North West ecosystem in the 32 forest blocks this ecosystem was present in are reserved, the reservation level of this ecosystem would increase by 11.4% (from 19.3% to 30.7%). Similarly, if all areas with a high probability of flora species richness where present were reserved, the reservation level of this value would increase by 16.9% (from 75% to 92%). Other factors relating to reserve design would also need to be considered for example boundary/area ratios.

- The reservation levels of some ecosystems, vegetation complexes, areas with flora values (e.g. disjunct flora) and areas with high aesthetic value could be increased substantially by the inclusion of areas currently held as Crown land or as freehold private property; more so than by reserving areas with these values in forest blocks included in this assessment.

- Conservation on private land, using Stewardship Agreements or mechanisms under the Land for Wildlife scheme, should be encouraged because of the noted presence of areas with conservation value on private land. That the inclusion of these lands to the reserve system may provide an additional income to landholders may provide additional motivation.

- Some of the additions to the reserve system proposed by WAFA in 1998 and since can only be made by altering definitions, criteria and targets contained in the Terms of Reference for this study. For example, WAFA's proposals would require a change to the view taken of informal reserves, the boundary which defines reservation targets (currently the RFA boundary) and the definition of old growth forest. These are decisions for Government.

- Government should consider whether to amend Section 5 of the *CALM Act 1984* to recognise that 'informal' reserves in State forest are managed for conservation and to designate these as a conservation category within State forest. This may help change the perception held by conservation groups that informal reserves have no protection.

Old growth Forests

Using the NFPS and JANIS operational definition of old growth, this assessment found no remaining areas of old growth forest within the study region that were not already reserved.

Wilderness

Using the definition of wilderness used in the CRA (Commonwealth and Western Australian RFA Steering Committee, 1998), there were no areas of wilderness identified in the study region.

Sensitivity to Disturbance

Assessing the sensitivity of forest ecosystems and vegetation complexes was possible only in general terms because of the complexity of this topic and the time constraints on this study. Information on the sensitivity of Declared Rare Flora and Threatened Fauna indicates some species are sensitive to the effects of timber harvesting, prescribed burning and *Phytophthora*. The debate over whether there is sufficient data to assess the impacts of logging and prescribed burning on Threatened Fauna and the likelihood that there are some species within a few flora and fauna groups (e.g. fungi, aquatic invertebrates) as yet undiscovered in the South-West, indicates that caution in interpreting the information presented is required.

Ecoscape would also like to emphasise:

- The Terms of Reference were set by the Conservation Commission, the definitions to be used (for example for old growth), the criteria (for example the JANIS criteria) and

the targets to be met (for example 15% or 100% of the estimated pre-1750 area). However, data on the proportions of reserves contributed from formal and informal sources is provided to allow consideration of relative status of reservation as discussed in Section 1.1 of the report.

- This was a desk-top study. No additional biological data could be collected in the time available for the study.
- CLM's role was to provide data requested and explain data that may have been unclear. CLM did not have any role in the evaluation, assessment and writing of the report.
- Data for areas to be assessed were provided to Ecoscape on a forest block basis.
- If the government decides that forest blocks are to be added to reserves on the basis of "Community attachment", they should do so in a transparent way rather than by altering existing definitions for criteria or target levels. Any change to definitions at this stage of the process will have ramifications elsewhere.
- The Terms of Reference did not require Ecoscape to address the consequences of any potential addition to the reserve system that the Government may decide on. Any implications of a reserve addition on sustainable timber yield, employment or other economic and social factors are beyond the scope of this report.

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A Review of High Conservation Values in Western Australia's South-West Forests

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Appendix One: Terms of Reference

A Review of High Conservation Values in Western Australia's South-West Forests

1. Terms of Reference

The consultant will:

Audit the data outputs prepared by the Department of Conservation and Land Management, to verify that the data has been objectively assembled and the outputs competently generated.

Document and assess the values of each of the areas on the list in relation to the criteria for high conservation value forest which relate to:

- old-growth forest;
- biodiversity, with the primary unit of evaluation being 'forest ecosystems', but noting the other considerations under the biodiversity criteria;
- wilderness; and
- areas of special significance in terms of a high level of community attachment as specified in Attachment 1.

The assessment is to focus on the contribution the area could make to a comprehensive, adequate and representative (CAR) reserve system.

In assessing the values in each of the areas, consider and report the level of reservation in relation to the existing and proposed reserve system as a result of the Government's *Protecting our old-growth forests* policy for each of the values identified in each area. Where appropriate, report the additional reservation of each value that could be contributed if the area were to be reserved.

For those areas that satisfy a criterion not adequately represented on a regional basis, advise whether or not the value is sensitive to disturbance.

2. Reports

The consultant will present an interim report to the Conservation Commission of Western Australia by the end of the year and a final report by the end of January 2002. The interim report should relate to areas from the list and included in the 2002 Indicative Harvest Plans.

Each report will include:

- A summary identifying those areas that satisfy a criterion not adequately represented on a regional basis, and whether or not the value/s identified in those areas are sensitive to disturbance.

- Full documentation and assessment of the values for each of the areas on the list (areas from the list and on indicative harvest plans for the interim report). The source of all data used in the reports should be documented.

It is anticipated that the Conservation Commission will make the reports publicly available.

Assessment criteria for high conservation value forests

1. Old-growth forest

All old-growth forest (using the definition of old-growth forest in the 1992 National Forest Policy Statement and the operational interpretation in the JANIS Report).

2.1 Biodiversity

2.1 JANIS biodiversity criteria for the comprehensive, adequate and representative (CAR) reserve system, which may be summarised as:

- 15% of the pre-1750 distribution of each forest ecosystem should be protected in the CAR reserve system;
- where forest ecosystems are recognised as vulnerable, at least 60% of their remaining extent should be reserved;
- all remaining occurrences of rare and endangered forest ecosystems should be reserved or protected by other means;
- reserved areas should be replicated across the geographic range of the forest ecosystem;
- the reserve system should seek to maximise the area of high quality habitat for all known elements of biodiversity wherever practicable, but with particular reference to:
    - the special needs of rare, vulnerable or endangered species;
    - special groups of organisms, for example species with complex habitat requirements, or migratory or mobile species;
    - areas of high species diversity, natural refugia for flora and fauna, and centres of endemism; and
    - those species whose distributions and habitat requirements are not well correlated with any particular forest ecosystem;
- reserves should be large enough to sustain the viability, quality and integrity of populations;
- to ensure representativeness, the reserve system should, as far as possible, sample the full range of biological variation within each forest ecosystem; and

- in fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system and should be protected.

2.2 Areas of special significance in terms of their biophysical naturalness, or as linkages or corridors.

3. Wilderness

90%, or more if practicable, of the area of high quality wilderness that meets minimum area requirements should be protected in reserves.

4. Other

Areas of special significance in terms of a high level of community attachment due to their importance:

- for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, State, region or community; or

- in demonstrating a distinctive way of life, custom, or land use no longer practised, in danger of being lost, or of exceptional interest; or

- for information contributing to a wider understanding of the history of human occupation in the State; or

- for close associations with individuals whose activities have been significant with the history of the State or region.

Appendix Two:
Blocks Included in Assessment

A Review of High Conservation Values in Western Australia's South-West Forests

The forest blocks below were included in this assessment (2002 Harvest Plan blocks are in bold). The number beside each block is used in Table 2, Section 4 to identify which blocks contain each conservation value:

Swan Region			
1	**Amphion**	15	Howse
2	Balmoral	16	**Keats**
3	Bannister	17	Lang
4	**Bombala**	18	Leona
5	Boonering	19	**Pindalup**
6	Brady	20	Qualen
7	Churchlands	21	Sullivan
8	Cooke	22	Talbot
9	**Curara**	23	Taree
10	Dale	24	Tumlo
11	Flint	25	Wandoo around Mundaring
12	Flynn	26	Wearne
13	Geddes	27	Yarragil
14	Hakea	28	Young
South West Region			
29	Adelaide	50	Hester
30	Barrabup	51	Hovea
31	Bednall	52	Hunt
32	Bell	53	Kerr
33	Bidella	54	McAlinden
34	Blackwood	55	Moonah
35	Butler	56	Morgan
36	Canebreak	57	**Mullalyup**
37	**Catterick**	58	Munro
38	Central	59	Nelson
39	Chalk	60	**Preston**
40	Chester	61	**Rapids**
41	**Dalgarup**	62	Red Gully
42	Darradup	63	**Roseneath**
	Est Marg R. & West Sues Rd =	64	Schroeder
43	Bramley	65	Sherwood
44	Chapman	66	Sollya
45	Forest Grove	67	Stockyard
46	Molloy	68	Storry
47	Mowen	69	Telerah
48	Treeton		
49	Witchcliffe		

Warren Region			
70	**Boorara**	94	Little Quinninup Brook
71	**Boyndaminup**	95	Mersea
72	**Brockman**	96	**Mindanup**
73	**Challar**	97	Muirillup
74	Chitelup	98	**Murtin**
75	Cleave	99	**Nairn**
76	Collins	100	Northcliffe
77	Corbal	101	Poole
78	**Court**	102	Poorginup
79	**Crowea**	103	Rocky
80	**Dombakup**		Shannon-Frankland link =
81	Dudijup	104	Burnside
82	Dwalgan	105	Mossop
83	Easter	106	Spring
84	Flybrook	107	**Stoate**
85	**Gobblecannup**	108	**Strickland**
86	**Graphite**	109	**Sutton**
87	**Gray**	110	Swarbrick
88	**Iffley**	111	Walcott
89	Kingston	112	**Warren**
90	**Kinkin**	113	Warrup
91	Lane	114	**Weld**
92	**Lewin**	115	Winnejup
93	**Lindsay**	116	Yardup
		117	**Yornup**