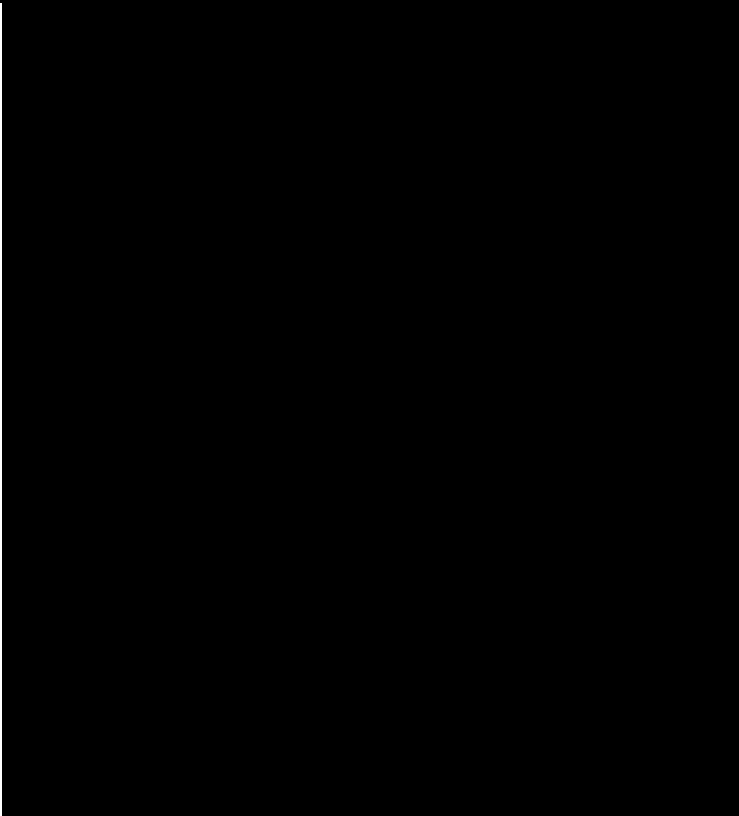


**IDENTIFICATION OF PLACES OF NATURAL HISTORY SIGNIFICANCE IN NEW SOUTH WALES
COMPREHENSIVE REGIONAL ASSESSMENT (CRA) FOREST REGIONS**

Sites of Potential National Estate Value

September 1999



**IDENTIFICATION OF PLACES
OF NATURAL HISTORY
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WALES COMPREHENSIVE
REGIONAL ASSESSMENT (CRA)
FOREST REGIONS.
SITES OF POTENTIAL NATIONAL ESTATE
VALUE.**

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A project undertaken as part of the
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**IDENTIFICATION OF PLACES OF NATURAL HISTORY SIGNIFICANCE IN NEW
SOUTH WALES COMPREHENSIVE REGIONAL ASSESSMENT (CRA) FOREST
REGIONS**

2. SITES OF POTENTIAL NATIONAL ESTATE VALUE

SUMMARY:

Four CRA Regions (Eden, Southern, Northern and Far North) were assessed on the basis of National Estate Criteria C1 i.e. “Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, Type locality, reference or benchmark site”.

Information about potential C1 sites was obtained from numerous sources, including scientific literature, contributions from natural history groups, discussions with individuals and university publications. Contact was made with 25 organisations and more than 50 individuals.

Ranking of sites into three categories occurred. High and Moderate ranking sites were accepted as having the potential for nomination to the National Estate Register. Low ranking sites were rejected. Ranking was based upon factors such as the length of time a site has been used for research or teaching, the amount of research at a site, the number of people using Teaching Sites, the rigor and repeatability of survey methods, the accuracy of site location.

A total of 247 sites were ranked as having High or Moderate value, and have the potential of nomination onto the Register. The breakdown of these sites within the four CRA Regions is given in the following table:

C.1 SITES WITHIN THE FOUR CRA REGIONS					
CRA REGION	RESEARCH SITES	TEACHING SITES	REFERENCE SITES	TYPE LOCALITIES	TOTAL
Eden	7	1	2	9	19
Southern	5	3	19	57	84
Northern	12	16	27	37	92
Far Northern	4	7	11	30	52
Total	28	27	59	133	247

Each site is described within the report, either as a summary within the main text, or in more detail in the Appendices.

**IDENTIFICATION OF PLACES OF NATURAL HISTORY SIGNIFICANCE IN
NEW SOUTH WALES COMPREHENSIVE REGIONAL ASSESSMENT (CRA)
FOREST REGIONS**

2. SITES OF POTENTIAL NATIONAL ESTATE VALUE

By Dr Martin Denny, August, 1998

1.0 BACKGROUND

The first report (Identification Of Places Of Natural History Significance In New South Wales Comprehensive Regional Assessment (CRA) Forest Regions 1. Compilation of database March, 1998) provided information about sites within the CRA Regions (including the Sydney Basin Region) to be assessed in terms of their national estate values (Criteria C1). Report 1 lists and maps these potential sites, as well as providing information about most of the sites.

During April and up to the production of this report, information about potential sites continued to be provided by organisations and individuals. This information has been incorporated into Report 2. As pointed out in the Tender information, the survey of sites is restricted to flora and fauna i.e. no sites involving geological, geomorphological or palaeological studies or geological type localities are included. It is understood that a separate project dealing with geoheritage within the CRA Regions is currently being undertaken.

This report analyses the data obtained between March and June and provides descriptions of those sites considered of sufficient value to be nominated to the Register of the National Estate.

2.0 SITE ASSESSMENT METHODOLOGY

2.1 APPROACH TO ASSESSMENT

At present, there have been four studies that have attempted to rank sites in terms of their national estate significance. These are:

Australian Heritage Commission and Department of Conservation and Natural Resources 1994
“Method papers: Central Highlands Joint Forest Project Volume One – Natural Values”
(Chapter 7 Sites important for understanding Australia’s natural history)

Australian Heritage Commission and Department of Conservation and Natural Resources 1996
“Method papers: East Gippsland National Estate Assessment Volume One – Natural Values”
(Chapter 7 Sites important for understanding Australia’s natural history)

Tasmanian Public Land Use Commission 1997 “Tasmania-Commonwealth Regional Forest Agreement National Estate Report Background Report Part H” (Chapter 3 National Estate

natural values, and Appendix R Indicative research, teaching and benchmark sites considered to meet the threshold for National Estate criterion C.1)

AHC and ERIN 1995 “Cape York Peninsula Land Use Strategy Land Use Program Areas of Conservation Significance on Cape York Peninsula” (Chapter 18 Areas of significance for their contribution to research or as type localities, and Figures 18.1 to 18.5)

These studies address the problem of ranking sites by virtue of the significance of their national estate values (criteria C.1). A table in the Tender information document (Attachment 1.1) provides a summary of the considerations taken into account in the above four studies.

There are four criteria used within Criteria C.1 to evaluate whether a site contributes to a wider understanding of Australian natural history. These are:

- Has research occurred at the site?
- Has teaching occurred at the site?
- Does the site provide reference information?
- Is the site a type locality?

Any site that contributes to a wider understanding of Australian natural history because it satisfies one of the above criteria could be nominated to the Register of the National Estate. It should be noted that there are no values placed on this criteria e.g. no terms such as “significant” or “relative” are included in the criteria statement. Thus, any site that can be demonstrated to contribute information to a wider understanding of Australian natural history can be nominated to the Register.

However, the universal application of such criteria could lead to a plethora of Register nominations. As will be described in this report, there are tens of thousands of sites that can be classed as reference sites, all of which could be nominated to the Register. Similarly, there are large numbers of type localities for the hundreds of species known from Australia. In addition, there are four varieties of type specimens to be considered (Holotype, Paratype, Syntype and Lectotype). With this in mind, it is important to attempt to rank the importance of each site, in terms of its contribution to Australian natural history.

One approach that could be taken is to rank each site on the basis of its geographical importance. There have been attempts in the past to rank each site nominated to the Register on a hierarchical level. Nominated sites were ranked as having national, State, regional or local importance. However, this proved to be confusing, as there were no criteria for such ranking. If one attempts to place a Type Locality into such a ranking process, then most sites would be of international importance (as most species would be endemic to Australia). Research on an Australian species could also be considered of national or international importance, as the results of the research would be unique world-wide. Such an approach to ranking sites is not productive.

Because there is a need to limit the number of sites nominated to the Register under Criteria C.1, a better approach is to provide thresholds for each of the four criteria. Once a threshold of each criterion is passed, then a site can be nominated. If a site is being assessed on more than one criterion (e.g. research and teaching), then the additive values associated with each criterion may allow this site to be nominated, even though the threshold for each criterion may not be reached.

The method used to assess the value of the sites on the basis of each criterion is provided in the following sections.

2.2 RESEARCH SITES

A site where there has been some association with research, teaching or survey activity can be classed as a Research, Teaching or Reference Site. However, these activities can overlap so that a site could be classed into any or all of the three types. An initial assessment of each site was undertaken to determine whether the one or all of the three activities had taken place. To determine the classification of each site the following protocol, based upon the length of time the site has been associated with an activity, was applied:

If an activity had been associated with a site for less than three to four years, then the site could be classed as a research, teaching or reference site depending upon the type of activity undertaken at the site. The time period of 3-4 years was established as it was apparent, when analysing the information associated with each site, that many sites were only used for study sites for a thesis topic (either PhD or Masters). Where such studies were associated with a site, this site could be classed as a Teaching Site.

There are some exceptions to this rule – a single site may be associated with many thesis studies over many years e.g. Myall Lakes area. In this case the site was classed within those sites where there had been more than four years activity. Where some of the output from the thesis study could be considered to be of high quality research, then the site would need to be classed as a Research Site.

If an activity associated with a site was undertaken over a relatively short period of time i.e. one or two years or less, then the site could be placed within one of two classes. If the output from the activity was research of a high quantity and/or quality, then the site could be classed as a Research Site. If the activity was a ‘one-off’ vegetation and/or fauna survey, then, provided the survey was sufficiently rigorous, the site was classed as a Reference Site.

If an activity associated with a site had been undertaken over more than four years, then it could be classed as one of three Sites. If research had been undertaken at the site over a period of years and the results had been published, then the site was classed a Research Site. If the activity associated with the site had taken place over many years, but was predominantly a monitoring exercise e.g. bird-banding, then this site could be considered a Reference Site. In assessing the information associated with each site it was apparent that at some sites where

long-term observations were undertaken, if these observations were part of a specific project, there was some form of published results for the project. In these cases, it was possible to class the sites as Research Sites. This was the case with the two main sites in NSW where populations of the Regent Honeyeater are being monitored.

In addition to the above protocol, it was possible to class a site as a Teaching Site, if there was evidence of the sites use by University and community groups. Often, a Research Site and a Teaching Site were the same e.g. Newholme Field Laboratory.

The above protocol can be summarized as:

LENGTH OF TIME OF SITE USE	> 4 YEARS	Research projects with published results	RESEARCH SITE
		Monitoring of flora/fauna	REFERENCE SITE
		Used for teaching by universities etc	TEACHING SITE
	< 4 YEARS	Thesis study site	TEACHING SITE
Specific short-term study project		RESEARCH SITE	
One-off flora/fauna survey sites		REFERENCE SITE	

Research Sites are ranked according to the quantity and quality of research output applying similar factors as those used in the Tasmanian, East Gippsland and Central Highlands studies. These can be summarised as:

- Significance of the research
- Duration of research at each site
- Amount of research at each site
- Rarity of the site and/or research topic

One interesting aspect of Research Site assessment is that associated with output of research not directly associated with the site. Study areas within north-western Sydney¹ e.g. Ebenezer, were used by eminent ecologists such as Allen Keast early in their research career to produce papers about individual species and topics. However, it is likely that the experience gained at such sites would have assisted in developing some of the major ecological theories associated with this researcher. Thus, a site such as Ebenezer, or the Zoologists Cabin in Royal National Park (where pioneering work by Jock Marshall on bowerbirds and Norm Chafer on warblers was undertaken) need to be assessed from a broader cultural basis. There are several other areas where historically important activities occurred. The first cooperative bird-banding in NSW was established at Longneck Lagoon in about 1975, and bird banding activities in the

¹ Unfortunately, the Sydney Basin Region is not included within this study, but information about sites in this Region are given in Appendix 7.

Upper Lane Cove River catchment twenty years ago assisted in the training of some of the research ornithologists today. Unfortunately, the sites at Lane Cove have been cleared.

2.3 TEACHING SITES

Teaching Sites were defined in the East Gippsland study as “those places where teaching was taking or had taken place, where the primary aim of that teaching was to increase understanding about Australian natural history” (p.135).

Although the other studies concentrated upon teaching associated with universities, there are many sites where teaching is associated with community groups and the training of individuals and groups involved in natural history conservation. Sites used for long-term bird observations are often associated with the teaching of groups, including school groups. There are several field stations associated with universities, as well as with schools and community groups. Some of the field stations are not included in this report, which concentrates upon sites within forests. The University of New South Wales Field Station at Smiths Lake has been excluded because it is associated with an aquatic environment. Another exclusion has been the Jervis Bay Botanic Gardens, which caters for “general public and students ranging from infant to tertiary level” (p.171, ANCA, 1995). This site is associated with an aquatic and heath environment, not forest.

Ranking of Teaching Sites has been based upon the following factors:

- Duration of teaching
- Number of people taught
- Level of teaching
- Facilities for teaching
- Association with other values e.g. research

Some of the Teaching Sites attract relatively large numbers of people. These people attend courses given by experts in particular subjects, and are usually run during school holidays or weekends. Susan Island at Grafton is used to teach about the general environment (it has a large flying-fox camp), as well as specific courses on bush regeneration and weed control. Barren Grounds Bird Observatory also runs courses for the public. These courses offer specific subjects, such as wildlife photography, amphibians, forest floor dwellers, bird identification, tree identification, and building nestling boxes.

2.4 REFERENCE/BENCHMARK SITES

The East Gippsland study describes Reference Sites as places displaying a relatively undisturbed example of characteristic biophysical features and processes, which allow the progression of natural processes to be measured and observed and provide a comparison for those characteristics with those from a more disturbed environment. Reference Sites provide baseline data for measuring spatial and/or temporal change. This definition assumes that

information about the biophysical characteristics of a Reference Site has been obtained in a rigorous and repeatable manner, and that these Sites will be protected from further human disturbance. It is also assumed that the Reference Site has been accurately located and relocation is possible.

Assessment of the significance of Reference Sites is based upon the following:

- Rarity of the sites biophysical characteristics
- Representativeness of the biophysical characteristics of the site
- Comprehensiveness and rigor of information collected
- Whether a monitoring program has been established, and the degree of monitoring

Some Research Sites can also be considered as Reference Sites. Some Reference Sites have been established to monitor changes in the biophysical characteristics following a single disturbance e.g. logging, fire. Although the Sites cannot be considered undisturbed initially, they continue to provide a benchmark of information for comparison with undisturbed sites, or with sites of varying degrees of disturbance.

2.5 TYPE LOCALITIES

The localities of type specimens of plants and animals can be considered for nomination to the Register under Criteria C.1. As pointed out in Section 1.0, Type Localities can be considered of international importance, as most species found in Australia will be endemic. There are two major problems in assigning a Type Locality. Many localities of type specimens are only given as vague geographic sites e.g. New Holland, Port Jackson. Such localities are impossible to list as Type Localities. The other major problem with assigning a Type Locality is whether the site where the type specimen was originally located is still in existence i.e. has the original site been destroyed or badly disturbed. Such is a case for many species described early in the history of settlement e.g. Sydney suburbs.

Establishing thresholds for precision of locality description solves the first problem. The Tasmania study provides five levels of precision used in defining type localities (Table 3.17). This study adopted a standard of precision by only accepting a location if it was precise to within a 1 km radius i.e. to the nearest minute of a latitude-longitude reference point. This allowed spot localities such as a particular hill, summit of a mountain, junction of watercourses or roads, and an accurate distance from a defined locality to be used as a Type Locality. The second problem i.e. site disturbance, cannot be covered in this study, as it requires extensive field investigations. However, the site of a Type Locality, whether the specimen still exists today or not, is still of national estate significance.

Even with the restriction of precise locations, there are very many Type Localities within the study area. Information obtained from the Australian National Insect Collection gave Type Localities for over 500 insects (most of these were precise to one minute). Added to this were Type Localities for arachnida, mammals, reptiles, amphibians, lichens, mosses, liverworts and

vascular plants. To further limit the number of Type Localities, only vascular plants, mosses and liverworts listed as Threatened in NSW and/or Australia were accepted. There were few precise Type Localities for arachnida, mammals, reptiles and frogs, and these were accepted without further restriction. In the case of the insects, analysis was undertaken of the 500 plus sites and only those sites where there were type specimens of three or more species were accepted. Also, any sites where there was more than one type specimen known were given greater value.

Full lists of type localities for a range of organisms is given in Appendix 1. Not all of these localities qualified as Criteria C1 Type Localities.

2.6 THRESHOLDS

Each of the four criteria is associated with factors to allow the ranking of each site. The sites were ranked as having High, Moderate or Low value as a C1 site of National Estate importance. In this study, only those sites that were ranked as having High and Moderate values were considered for inclusion in the nomination process i.e. those sites of Low value did not reach the threshold and were rejected. There is a discussion of the characteristics of rejected sites later in this section.

Factors used to derive threshold values for Research Sites are:

- Length of research activities at each site - the longer a site has been used for research the higher its value
- The length of time of each research activity – it was considered that extended research projects at a site were of more value than short-term ‘one-off’ research projects (this is debatable and is associated with ‘quality of research’, see later discussion)
- The number of research projects associated with a site – the more research projects undertaken at a site, the higher its value
- The nature of research. Specifically, research on native organisms was ranked higher than research on introduced species (even if impact studies)
- The amount of accessible information arising from a research site – the greater the number of publications the higher the value of the site

Although used in other assessments, quality of research has been avoided, as the output of any research project can be classed of differing quality by different researchers. The quality of a research project may be high to a researcher engaged in similar research, but low to another scientist not associated with the particular field of research. It would be possible to quantify the quality of a piece of published research by counting the number of citations in other publications i.e. the number of times a particular reference is cited in another reference. There are Citation Indexes that will provide this information, but there was insufficient time during this project to attempt such a task.

Factors used to derive threshold values for Teaching Sites are:

- Level of teaching – whether the site is used for university, school or community teaching. Other studies have given university teaching the highest weight, but it can be argued that community teaching may be of more importance. This study ranks those sites used by all three classes (university, school and community) as having the highest value
- Number of people taught at the site – the greater the number of participants the higher the site's value
- The range of teaching subjects – the greater the number of subjects taught at the site, the higher its value
- Facilities for teaching – the greater the range and quality of facilities the higher the site's value
- Association with research – the combination of Research Site and Teaching Site gives a higher value to the site

Factors used to derive threshold values for Reference Sites are:

- Rigor of methodology – the methods used to produce information from a site need to be acceptable to other researchers, fully described and repeatable
- Accuracy of location – the site needs to be accurately located to ensure repeatable surveys can be undertaken
- Length of surveys – long-term monitoring surveys have a higher value than short-term or one-off surveys
- Availability of information – the degree of access to the results from surveys at sites needs to be high

Factors used to derive threshold values for Type Localities are:

- Accuracy of location – this needs to be within a one kilometre reference i.e. one minute per latitude/longitude degree
- Rarity of species – only rare and/or threatened species are included
- Number of species – sites with more than one Type Species are given high value

Type Localities are not ranked into High, Moderate or Low. Rather they are either accepted (because they have rare species and/or a number of species), or rejected, because they do not have accurate locations and/or have only one example of a common species.

The ranking the Research, Teaching and Reference Sites is based upon the number of factors that each site possesses. Thus a Reference Site that shows the highest values for all four factors i.e. rigorous methods, accurate location, long-term monitoring and easy access to data, will be ranked as having a High value. A site with high values for one or two of these factors is ranked Low i.e. rejected. A Moderately ranked site will have high values for three of these factors.

The approach to ranking and factors used can be summarized in the following table:

RESEARCH SITE	TEACHING SITE	REFERENCE SITE
Site Use – more than 5 years ²	Teaching – All 3 groups	Methods – Rigorous
Projects – 3 years and longer	No.People – High Numbers	Location - Accurate
No.Projects – More than 2	Range of subjects – 3+ Surveys – Long-term	Surveys - Repeatable
Research – Native Species	Facilities – Building etc	
Data – More than 5 publications	Research – Associated	

The more of each of these factors, the higher ranked the site. If only one or two of the factors are applicable, then the site is ranked Low and rejected.

Rejected sites are not described in this report, as this would significantly increase its bulk. However, a brief review of the characteristics of rejected sites is provided.

Many sites were rejected because any associated literature did not provide accurate locations. Other sites were rejected because the study area was too large, or the study sites were spread over a relatively diffuse area. Other rejected sites were those that were used for a single purpose on a single occasion e.g. collection of leaf lerps, measurement of reflectance from foliage. Some sites within forested areas concentrated upon the aquatic environment, or were located within cleared or grazed land.

2.7 DATA SOURCES

The size of the area meant that many Research, Teaching and Reference Sites, as well as Type Localities were potentially available for nomination. There are many teaching institutions within eastern NSW, not only universities, but also schools and technical colleges that have established Teaching Sites. Also, there are many Commonwealth and State research institutes that have Research and Reference Sites. Added to these sources of information, there are natural history societies that have established Research and Reference Sites.

Literature searches were undertaken of most established journals. Journals published in the last 20 years were searched, with earlier articles sought, if they were referenced in later articles. Proceedings of conferences, and natural history society newsletters, were also searched.

To ensure a wide sample of Research and Reference Sites associated with individuals and natural history societies was obtained, the information gathering net was cast as wide as possible. This has resulted in considerable amount of time being spent in contacting individuals

² These values are estimates for which there is no justification. There is a need for further study to develop such a system.

and societies, attending meetings and working through a 'network' of interested natural historians. In the time available, it is impossible to contact all interested parties, or to obtain all information. In addition, some government institutes are slow to respond, due to protocol rather than a reluctance to provide information. One pleasing aspect of this project is the enthusiasm that people contacted responded to my requests.

Type Localities were mainly obtained from published sources, such as the Zoological Catalogue of Australia and publications such as the conservation overview of Australian non-marine lichens, bryophytes, algae and fungi (Scott *et al*, 1997) and Flora of Australia Supplementary Series (e.g. Ramsay and Seur, 1994). Type localities of reptiles, amphibians, mammals and arachnids were extracted from the relevant publications. Type localities of plant species were available on the Internet, through the Australian Botanical gardens web site, as a search feature attached to the Australian Plant Name Index (Chapman, 1990). Because of the sheer bulk of plant names known from eastern NSW, only type localities of those species listed in the NSW Threatened Species Conservation Act, as endangered or vulnerable, were obtained. Type localities of insects were obtained from the Australian Insect Collection database (held by CSIRO Division of Entomology). This was kindly searched by CSIRO, and a list of over 500 type localities was obtained.

Information on the location of caves (karst features) within NSW were provided by Andy Spate (NSW NPWS), and information about those caves where fauna had been surveyed came from the publication by Eberhard and Spate (1995). Cave information is listed in Appendix 2.

Contact with institutes and individuals were by telephone, e-mail, letter and personal visits. A 'form letter' was provided to all contacts, and a copy of this letter is given as Appendix 3. More than 50 contacts have been made, most of which have provided information. The name of the institution or individual contacted is given in Appendix 4.

The information obtained about Research, Teaching and Reference Sites has been added to a database. Their localities (in latitude and longitude) have been added to Excel spreadsheets, and mapped onto a base map of the four CRA Regions (supplied by NSW NPWS), using Arc-View. Type localities have been placed onto spreadsheets and mapped onto the CRA Regions. The maps are provided as Appendices to this report and electronic versions of the maps and spreadsheets are available.

The location of sites within each CRA Region were obtained by use of a 'Clip by Polygon' tool from the Xtools ArcView extension supplied by Oregon Department of Forestry. Location of sites within National Parks and Nature Reserves and within areas of forest was also obtained using the clip tool. Data on the distribution of woody and non-woody vegetation within eastern NSW (Zone 56) was provided, under licence, from Environment Australia.

2.8 STUDY AREA

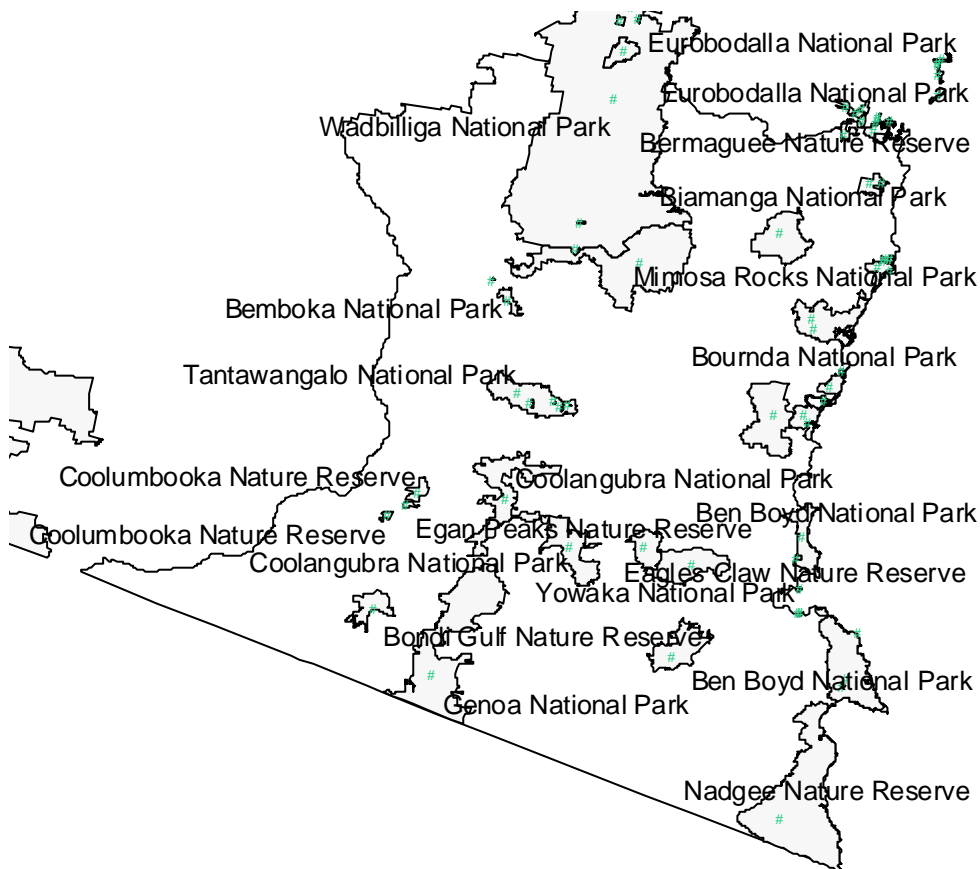
The scope of the project was defined in the Tender document, which stated that “The area to be covered by this natural history site assessment project is the forested public and private lands in the NSW CRA regions: Eden; Upper North East; Lower North East; and Southern.” This meant that the Sydney Basin CRA region is not included in the study area. However, information was obtained about potential C.1 sites located in the Sydney Basin region and will be included as Appendix 7 to the final report. The boundaries to the study area are shown.



3.0 PLACES OF NATIONAL ESTATE VALUE

Those places considered of sufficient value to be nominated to the Register of the National Estate are described in four sections. Each section represents one of the four CRA regions within the study area. A bibliography of references cited in the report is given as Appendix 5.

3.1 EDEN CRA REGION



The above map shows the extent of the Eden CRA Region, and the National Parks and Nature Reserves within this region (data courtesy of NPWS).

The four types of site considered meeting the thresholds for National Estate Criteria C.1 are described in Table 1 and are mapped in Figure 1. Table 1 only describes sites, which are considered to have high, or moderate value i.e. low value sites are not included (see Section

2.6). There are nine Type Localities, two Reference Sites, one Teaching Site and seven Research Sites, which are considered above the threshold for the criteria.

TABLE 1: Indicative Research, Teaching and Reference Sites and Type Localities considered meeting the threshold for National Estate Criteria C.1 within the Eden CRA Region. Summary of Information (greater detail in Appendix 5, see Site numbers)

SITE NAME AND LOCATION	SITE	REASONS FOR INCLUSION	RANKING	SELECTED REFERENCES
Mumbulla State Forest - Site 3	Research	Long-term studies on fire and drought on fauna	Moderate	Lunney et al, 1989
Waratah Creek Flora Reserve Site 7	Research	Long-term studies on arboreal mammals, logging and fire	High	Goldingay and Kavanagh, 1988
Nadgee State Forest - Site 26	Research	Long-term fauna studies, forestry practices	High	Braithwaite et al, 1983
Yambulla State Forest - Site 27	Research	Eden Burning Study; long-term studies of flora and fauna and fire	High	Claridge et al, 1991
Nadgee Nature Reserve Site 28	Research	Long-term fauna studies and recovery from fire	Moderate	Binns, 1984
Germans Creek, Yambulla State Forest - Site 35	Research	Yambulla Catchments Forest Hydrology Project - vegetation studies	Moderate	Harper and Lacey, 1997
East Boyd State Forest Site 31	Reference	Long-term studies of logging and flora and fauna	High	Kavanagh et al, 1985
Nimmitabel - Site 6	Teaching	PhD thesis site	Moderate	Robinson, 1992
Glenbog State Forest - Site 37	Reference	Tantawanglo Research Catchments vegetation studies	Moderate	State Forest reports

TYPE LOCALITIES

There are nine Type Localities within the Eden CRA Region. There are Type Localities for six Threatened plant species, two endangered lichen species (although these are at the edge of the Region) and a site which has Type Localities for five insect species.

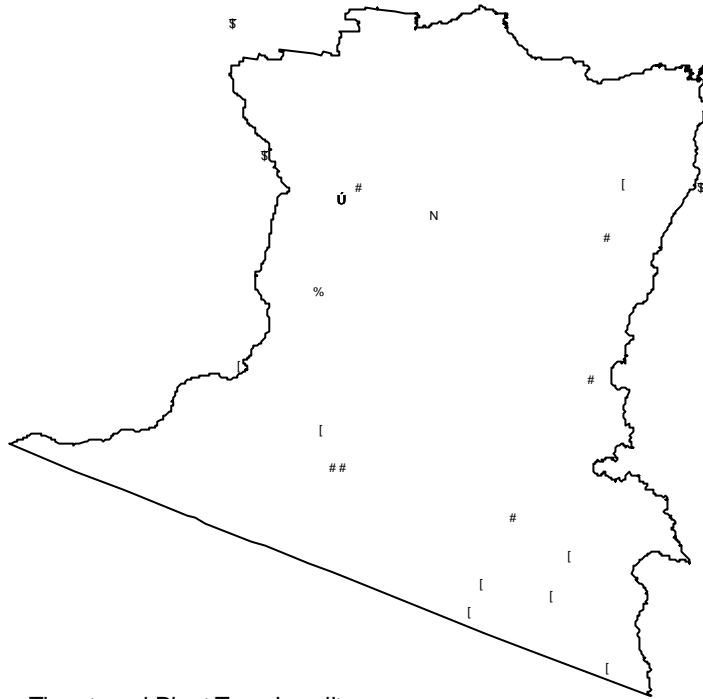
Threatened Plant Species: *Pomoderris parrisiae*
Acacia georgensis
Genoplesium rhyoliticum
Eucalyptus imlayensis
Phebalium rhytidophyllum
Grevillea acanthifolia ssp. *paludosa*

Endangered Lichens: *Pamelia crowi*
Xanthoparmelia burmeisteri

Single Site for Insects: *Botryocladus collessi*

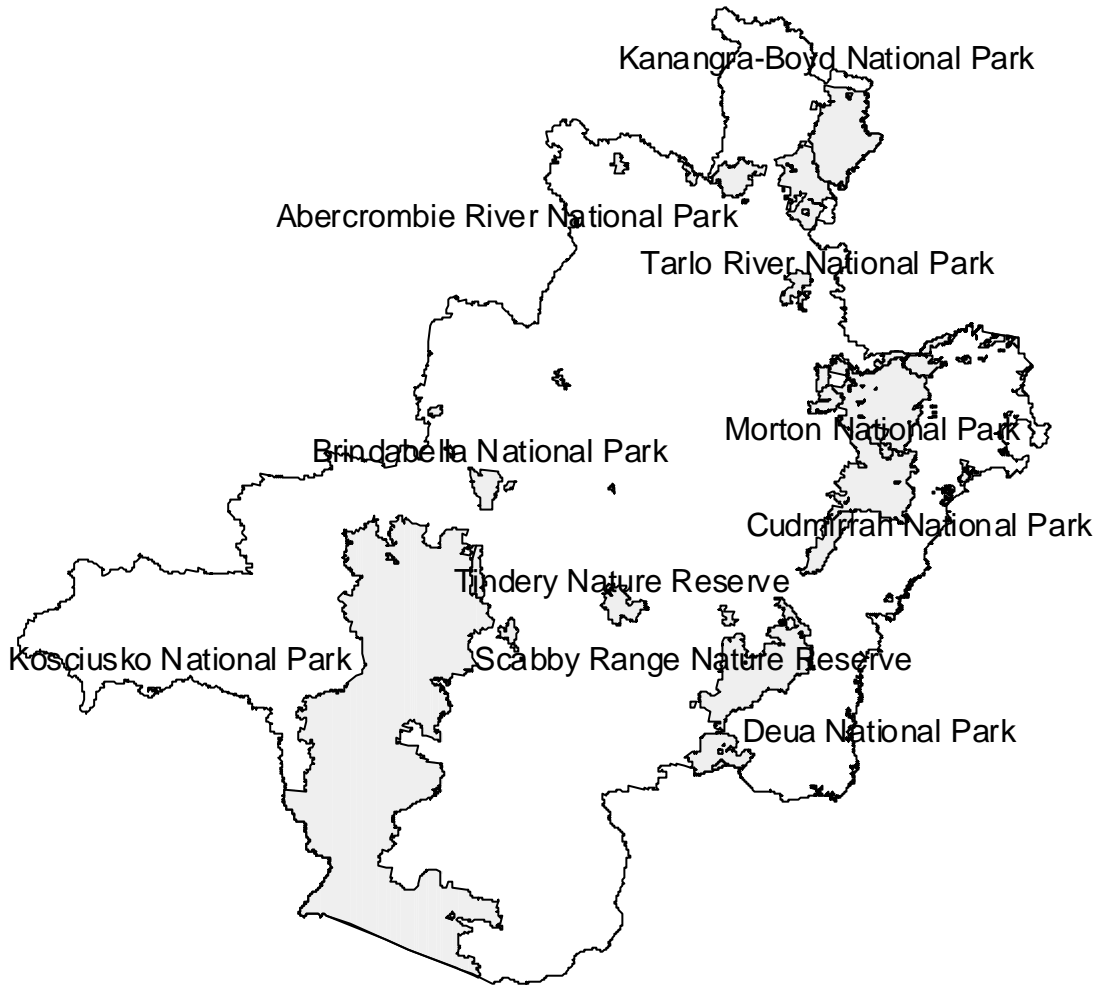
Botryocladus grapeth
Cricotopus coricorris
Cricotopus hillmanii
Pirara australiensis

FIGURE 1: NATIONAL ESTATE VALUES – INDICATIVE AREAS – NATURAL HISTORY SITES CRITERION C.1 EDEN CRA REGION



- # Threatened Plant Type Locality
- \$ Endangered Lichen Type Locality
- Eden CRA Region
- % Teaching Site
- [Research Site
- N Reference Site
- U Multiple Insect Type Locality

3.2 SOUTHERN CRA REGION



The above map shows the extent of the Southern CRA Region, and the National Parks and Nature Reserves within this region (data courtesy of NPWS).

The four types of site considered to meet the thresholds for National Estate Criteria C.1 are described in Table 2 and are mapped in Figure 2. Table 2 only describes sites which are considered to have high or moderate value i.e. low value sites are not included. There are 57 Type Localities, 19 Reference Sites, three Teaching Sites and six Research Sites which are considered above the threshold for the criteria.

TABLE 2: Indicative Research, Teaching and Reference Sites and Type Localities considered to meet the threshold for National Estate Criteria C.1 within the Southern

CRA Region. Summary of Information (greater detail in Appendix 5, see Site numbers)

SITE NAME AND LOCATION	SITE	REASONS FOR INCLUSION	RANKING	SELECTED REFERENCES
New Chums Road, Brindabella	Research	Over 36 years bird-banding site	High	Tidemann et al, 1988
Range - Site 14	Reference	Bird ecology and behaviour studies	High	Lamm and Wilson, 1966
Bombala, near Bondi State Forest - Site 22	Research	Bird studies, including foraging patterns and censusing methodology	Moderate	Shields and Recher, 1984
Moruya - Site 30	Research	Long-term bird studies	Moderate	Marchant, 1985
Beecroft Peninsula, Bherwerre Peninsula, Currumbene SF Site 51	Research Teaching	Orchid species, conservation genetics, pollination, small mammal studies	High Moderate	Harriss & Whelan, 1993 Whelan et al, 1998
Lees Creek and Blundle Creek Brindabella Range - Site 72	Research Teaching	Small mammal studies, several theses study sites (ANU)	Moderate Moderate	Dickman, 1986
Kiola State Forest - Site 50	Teaching	ANU Field Station, also used by Uni. Of Wollongong; Australian Pathfinder Site	High	ANU reports
Mulligans Flat Nature Park - Site 11	Reference	Long-term bird studies	Moderate	Canberra Ornithologists Club reports
Mt Mugga, ACT - Site 13	Reference	4 year bird-use study	Moderate	Olsen et al, 1991
Red Hill, Tumut - Site 38	Reference	Water quality impacts from plantations	Moderate	State Forest reports
Thermocline Cave, Marble Arch Site 87	Reference	Roosting behaviour study of bats over 3 years	Moderate	Hall, 1982

NOTE: The number of Reference Sites within the Southern CRA region is extremely large, as it is in the northern regions. There have been many flora and fauna surveys within the CRA regions for the purpose of environmental impact assessment (State Forests of NSW), biodiversity evaluation (NSW NPWS) or for research purposes (CSIRO Division of Wildlife and Ecology). To give an indication of the number of sites that are available for listing as Reference Sites, reports of recent surveys by State Forests in the southwest slopes region of NSW show that surveys were undertaken of nocturnal birds and mammals at 253 sites (Kavanagh and Stanton, 1998), bats at 63 sites (Law, B., J. Anderson and M. Chidel 1998), ground mammals at 53 sites and herpetofauna at more than 60 sites (Lemckert, 1998). Research undertaken by CSIRO in southern NSW (between Ulladulla and Bermagui) used 13 survey sites which were sampled on one or two occasions (see Catling, P.C. and R.J. Burt 1994 and 1995). Similar research was undertaken in northern NSW, where 21 sites were used (see Table 4 for more information on the northern regions). Dr M. Austin (CSIRO Division of Wildlife and Ecology) has established 10,000 vegetation sampling sites throughout eastern NSW.

Precise locations for most of these sites were not available within the duration of this project (locations for the CSIRO northern NSW sites are known and used in this report), however, it is unlikely that these sites would be classed as high value Reference Sites. This is because they are mainly 'one-off' survey sites without prospects of long-term monitoring.

CAVE FAUNA: Two CRA Regions (Southern and Northern) contain caves that have been sampled for representative invertebrate fauna. A survey of cave fauna within eastern NSW was undertaken by Eberhard and Spate (1995). A literature review was supplemented by the sampling of 130 caves within 48 karst areas (about 50% of the documented karst areas). Although the surveys were considered "reconnaissance", the information about the fauna inhabiting caves within the CRA regions can be used to establish Reference Sites for cave fauna. These Sites are considered to be of Moderate value, as their location is known accurately and the methodology is repeatable. Records of invertebrate fauna are known from the following caves (the locations of the caves are shown on Figure 2):

Bendethera (12 taxa recorded)
Bungonia (25 taxa)
Cheitmore (16 taxa)
Cooleman Plain (25 taxa)
Deua (18 taxa)
Jaunter (41 taxa)
Jenolan (67 taxa)
Little Wombeyan Cave (15 taxa)
Marble Arch (14 taxa)
Mount Fairy (31 taxa)
Talmo (12 taxa)
Tuglow (19 taxa)
Wee Jasper (53 taxa)
Yarrangobilly (33 taxa)

In addition, there is considerable information about bat fauna in several caves. The information is available as records of bat banding and research studies, to be found in the research literature e.g. Thermocline Cave (Hall, 1982), or in the annual reports of bat banding in Australia (CSIRO Division of Wildlife Technical Papers from 1962 to 1969). Several caves known as maternity roosts for bats are already listed on the Register e.g. Willi Willi Caves, Marble Arch, Yessabah Caves.

TYPE LOCALITIES

There are 57 Type Localities within the Southern CRA Region. There are Type Localities for four threatened plant species, 22 endangered lichen species, four endangered liverworts and mosses, three mammals, seven reptiles and frogs, three arachnids (one site has three Type species) and 14 sites that have Type Localities for three or more insect species.

Herpetofauna: *Underwoodisaurus sphyrurus*

Aprasia parapulchella
Hemiergus descresiensis
Austrelaps superbus
Limnodynastes dumerilii
Litoria tyleri

<i>Litoria verreauxii</i>	
<i>Pseudemoia spenceri</i>	All three at same site (Mt Kosciusko at 5000ft)
<i>Sphenomorphus kosciuskoi</i>	

Arachnids:

Lycosa kosciuskoensis
Lycosa musgravei All four at same site
Lycosa summa
Eterosonycha alpina
Paraembolides brindabella
Paraliochthonius cavicola

Mammals:

Antechinus agilis
Rhinolophus megaphyllus
Eptesicus sagittula

Threatened Plants:

Gentiana bredboensis
Pomaderris gilmourii
Eucalyptus kartzoffiana
Leptospermum deanei

Endangered**Liverworts:**

Brystreimannia turgida
Orthotrichum cupulatum
Bryum perlimbatum
Austrojeunea bidentata

Endangered**Lichens:**

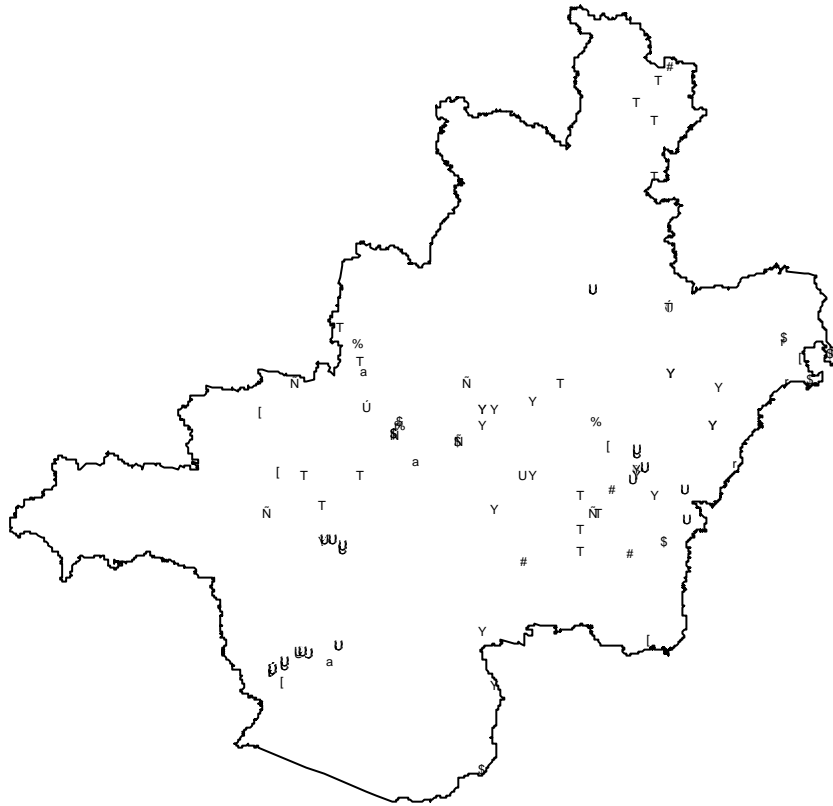
Neophyllis pachyphylla
Anzia tianjarana
Chandropis solediosa
Imshaugia evernica
Neofuscelia imitatricoides
Neofuscelia parasitica
Paraparmelia columbariensis
Paraparmelia neomongaensis
Parmelia protosulcata
Parmelina johnstoniae
Parmotrema convolutum
Xanthoparmelia austroconstricta
Xanthoparmelia hyposalazinica

Xanthoparmelia nigrocephala
Xanthoparmelia sublumenosa
Xanthoparmelia subpigmentosa
Anzia minor
Paraparmelia gregaria
Parmelia protosignifera
Parmelinopsis jamesii
Xanthoparmelia burmeisteri
Xanthoparmelia segregata

Single site for insects:

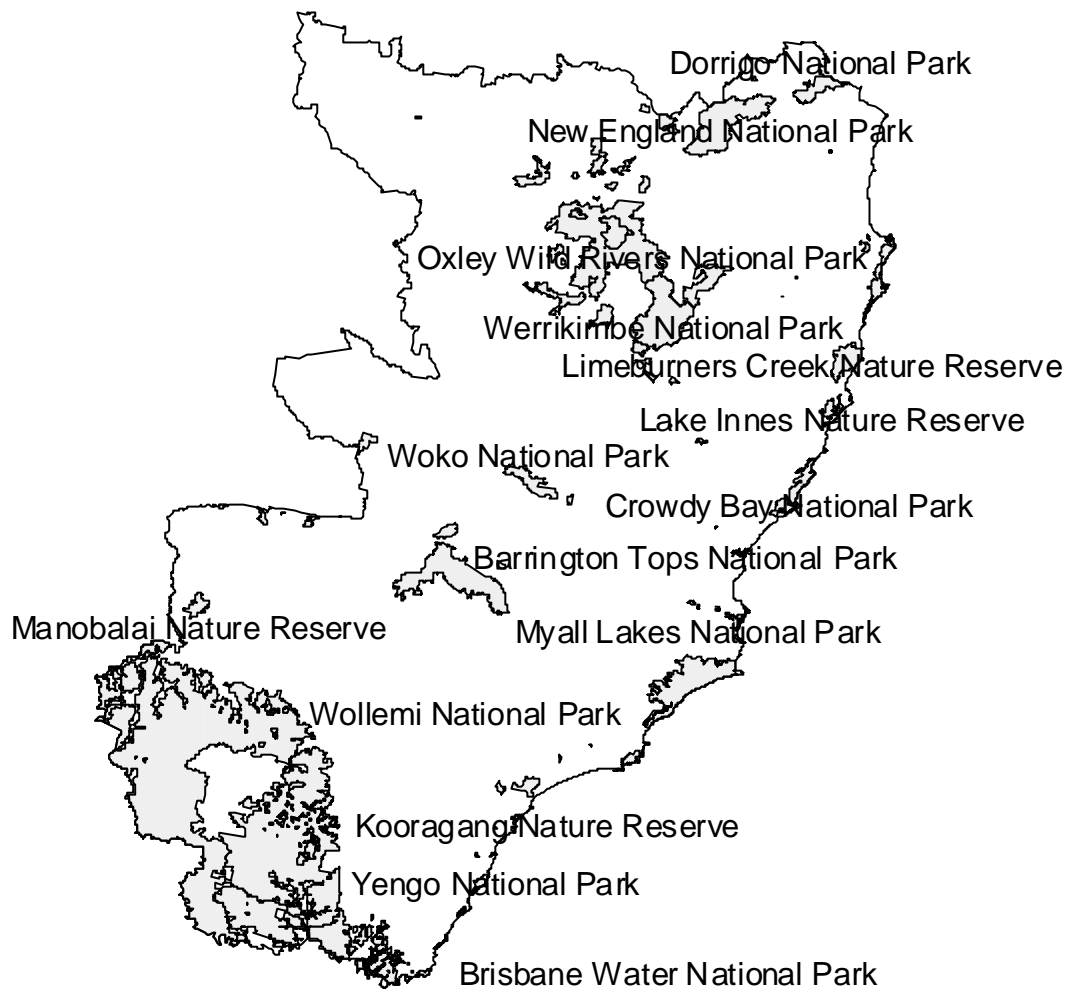
1. *Chalcolampra walgalu*; *Archichauliodes anagaurus*; *Austroargiolestes calcaris*; *Telephlebia brevicauda*; *Acruroperia atra*; *Leptoperia cacuminis*
2. *Microdonacia grevilleae*; *Austrocercella alpina*; *Riekoperia hynesorum*
3. *Microdonacia grevilleae*, *Austrodectes monticolus*, *Austrocercella nivalis*
4. *Austrodectes monticolus*, *Austrolimnium anytus*, *Austrolimnium keyi*, *Austrolimnium maro*, *Austrolimnium miletus*. *Austrodectes monticolus*
5. *Austrocercella alpina*, *Austrocercella autumnalis*, *Leptoperia curvata*, *Riekoperia hynesorum*
6. *Chlorodectes montanus*, *Austrocercella alpina*, *Riekoperia montana*
7. *Austrocercella alpina*, *Dinotoperia christinae*, *Roekoperia montana*
8. *Austrolimnium anytus*, *Austrolimnium maro*, *Austrocercella maro*, *Austrocercella alpina*, *Austrocercella autumnalis*. *Riekoperia montana*
9. *Austrocercella verna*, *Riekoperia compressa*, *Stenoperia kuna*
10. *Austrocercella illiesi*, *Dinotoperia eucumbene*, *Riekoperia karki*
11. *Austrolimnium alcine*, *Austrolimnium nomia*, *Austrolimnium waterhousei*
12. *Australocyon variegatus*, *Microdonacia eucryphiae*, *Austrolimnium codrus*
13. *Austrolimnium resa*, *Austrolimnium sulmo*, *Austrolimnium waterhousei*
14. *Austrolimnium calcus*, *Austrolimnium nicon*, *Austrolimnium opis*, *Austrolimnium waterhousei*

FIGURE 2: NATIONAL ESTATE VALUES – INDICATIVE AREAS – NATURAL HISTORY SITES CRITERION C.1 SOUTHERN CRA REGION



- Southern CRA Region
- # Threatened Plants (Sth)
- U Multiple Insects (Sth)
- % Mammals (Sth)
- Ñ Reference Sites (Sth)
- T Cave Fauna (Sth)
- \$ Research Sites (Sth)
- r Teaching Sites (Sth)
- Ú Arachnids (Sth)
- l Herpetofauna (Sth)
- Y Endangered Lichens (Sth)
- a Endangered Mosses etc (Sth)

3.3 NORTHERN CRA REGION



The above map shows the extent of the Northern CRA Region, and the National Parks and Nature Reserves within this region (data courtesy of NPWS).

The four types of site considered to meet the thresholds for National Estate Criteria C.1 are described in Table 3 and are mapped in Figure 3. Table 3 only describes sites that are considered to have high or moderate value i.e. low value sites are not included. There are 36 Type Localities, 22 Reference Sites, 16 Teaching Sites and 20 Research Sites that are considered above the threshold for the criteria.

TABLE 3: Indicative Research, Teaching and Reference Sites and Type Localities considered to meet the threshold for National Estate Criteria C.1 within the Northern CRA Region. Summary of Information (greater detail in Appendix 5, see Site numbers)

SITE NAME AND LOCATION	SITE	REASONS FOR INCLUSION	RANKING	SELECTED REFERENCES
Myall Lakes National Park - Site 1	Research	Long-term studies of mammals, fire, disturbance, vegetation, competition	High	Fox and McKay, 1977
	Teaching	Macquarie Uni, Uni NSW theses	High	Luo and Fox, 1996
Matcham, Gosford - Site 5	Research	Flying-fox ecology	Moderate	Parry-Jones & Augee, 1991
Olney State Forests - Site 10	Research	Fauna use of forests, RZS study site,	High	Kavanagh and Turner, 1994
	Teaching	monitoring of frog populations, bat banding, insect herbivory	Moderate	
	Reference		High	
Bundarra-Kingstown Site 12	Research	Regent Honeyeater studies, bird ecology, stock route values, Uni of New England study sites	High	Williams & Metcalf, 1991
	Teaching		Moderate	Ley et al, 1997
Eastwood State Forest - Site 20	Research	Long-term bird studies (1979-1998)	High	Ford and Bell, 1981
	Teaching	Uni of New England study sites	Moderate	Brigham & Geiser, 1997
New England National Park	Research	Long-term bird studies	Moderate	Ford and Pursey, 1982
Wright's Lookout - Site 21				McFarland and Ford, 1987
Bulls Ground, Lorne State Forest Site 32	Research	Frequent Burning Study, fire and vegetation, invertebrates	Moderate	van Loon, 1969
	Reference		High	York, 1997
Wollomombi Falls Reserve Site 23	Research	Long-term studies of birds and invertebrates	Moderate	Noske, 1979
Newholme Field Laboratory, Armidale - Site 71	Research	Fauna, fire, aquatic systems, soils, vegetation, water resources	High	Over 90 publications
	Teaching		High	
Warrah Trig, Pearl Beach Site 73	Research	Bird studies, flower biology	High	Pyke, 1981; Pyke and
	Teaching	Sydney Uni teaching and study site	High	Waser, 1981
Petroi/Diamond Flat Styx River State Forest - Site 97	Research	Dingo ecology, macropod behaviour, antechinus ecology, Uni New England theses sites	High	Harden, 1985
	Teaching		Moderate	Hollis et al, 1986
Lana, Armidale - Site 101	Research	Macropod ecology	Moderate	Jarman and Taylor, 1983
	Teaching	Uni New England PhD thesis site	Moderate	
Nelson Bay and Smiths Lake Site 4	Teaching	PhD (Macquarie Uni) site - small mammal study	Moderate	Kemper, 1990
Karuah, Dungog - Site 36	Teaching	Karuah Hydrology Catchment Project	Moderate	State Forest reports
	Reference	Uni Sydney teaching site, long-term	Moderate	

		monitoring of vegetation and insects		
Pappinbarra Field Studies Centre	Teaching	Long-term bird-banding, teaching	Moderate	Port Macquarie High
Site 44	Reference	school groups	Moderate	School reports
Sea Acres Nature Reserve - Site 63	Teaching	Field studies centre, community	Moderate	NPWS reports
Boarding House Dam, Watagan	Teaching	Uni Newcastle teaching site	Moderate	Mahony, 1993
State Forest - Site 75	Reference	Frog monitoring site	Moderate	
Gap Creek Flora Reserve, Watagan	Teaching	Uni Newcastle teaching site	Moderate	Mahony, 1993
State Forest - Site 76	Reference	Frog monitoring site	Moderate	
Mungo Brush, Myall Lakes	Teaching	Community education, 10 years bird	Moderate	None known
National Park - Site 61	Reference	observations, vegetation monitoring	Moderate	
Putty Road, Wollemi NP - Site 70	Teaching	Community education, long-term bird	Moderate	Cumberland Bird
	Reference	observations	Moderate	Observers reports
Five Day Creek, Armidale - Site 29	Reference	Long-term bird studies	Moderate	Cameron, 1985
Lorne Flora Reserve - Site 34	Reference	Kendall-Cooperook Ecologically	Moderate	State Forest reports
		Sustainable Case Study - bats		
Mount Boss State Forest - Site 39	Reference	Long-term bird studies	Moderate	Shields et al, 1985
Styx River State Forest - Site 43	Reference	Forest owl study site	Moderate	Debus, 1995
Bellingen Island - Site 74	Reference	Long-term monitoring of flying-foxes	Moderate	Lunney and Moon, 1997
Naru Reserve, Marks Point - Site 82	Reference	Long-term bat studies	Moderate	G.Hoye reports
Copeland, Gloucester - Site 83	Reference	Long-term bat studies	Moderate	G.Hoye reports
Mount Owen, Ravensworth State	Reference	Long-term monitoring of bat, Squirrel	Moderate	Fly by Night Surveys, 1996
Forest - Site 84		Glider and frog populations		
Banjo Creek, Doyles SF - Site 99	Reference	Monitoring changes in rainforest	Moderate	King and Chapman, 1983
		vegetation after logging		

CAVE FAUNA: There are 10 Reference Sites of Moderate value associated with caves sampled for fauna from within the Northern CRA Region (see page 17 for further explanation). Records of invertebrate fauna are known from the following caves (the locations of the caves are shown on Figure 3):

Comboyne (35 taxa recorded)
Crawney Pass (16 taxa)
Gloucester (56 taxa)
Kunderang Brook (20 taxa)
Moparabah (42 taxa)
Pigna Barney (24 taxa)
Stockyard Creek (93 taxa)
Timor (38 taxa)

Willi Willi (62 taxa)

Yessabah (42 taxa)

NOTE: There are numerous Reference Sites within the Northern and Far Northern CRA Regions. Many of these are associated with NPWS Biodiversity surveys, surveys associated with the Resource and Conservation Assessment Council (RACAC) and with the environmental assessment process undertaken by State Forests. As pointed out earlier, most of these sites are location of 'one-off' flora and/or fauna surveys and are ranked as having Low value because of the lack of on-going monitoring. Also, it is difficult to find exact locations for such sites, without considerable effort. The 21 sites described below (CSIRO research sites) have precise locations readily available and were mostly sampled on more than one occasion. Table 4 gives a list of references to sites, which have been used for one-off flora/fauna survey sites.

TABLE 4: ONE-OFF FLORA/FAUNA SURVEY SITES IN THE NORTHERN AND FAR NORTHERN CRA REGIONS

TYPE OF STUDY	NO.SITES	REFERENCE
Macroinvertebrates and aquatic plants of Upper North East Rivers	123	Fenton and Bales, 1995
Riparian and instream habitats of Upper North East	357	Anderson and Raine, 1995
Vertebrates of the Upper North East	125	NPWS, 1995a
Vegetation surveys of Upper North East	1843	NPWS, 1995b
Urunga-Coffs Harbour Forestry Management Area	171	Tweedie et al, 1995
Kempsey-Wauchope Forest management Area	159	Binns and Chapman, 1993
Glen Innes Forestry Management Area	82	Binns, 1992
Urbenville Forestry Management Area	77	Binns, 1995a
Tenterfield Forestry Management Area	89	Binns, 1995b
Casino Forest Management Area	196	Binns, 1995c

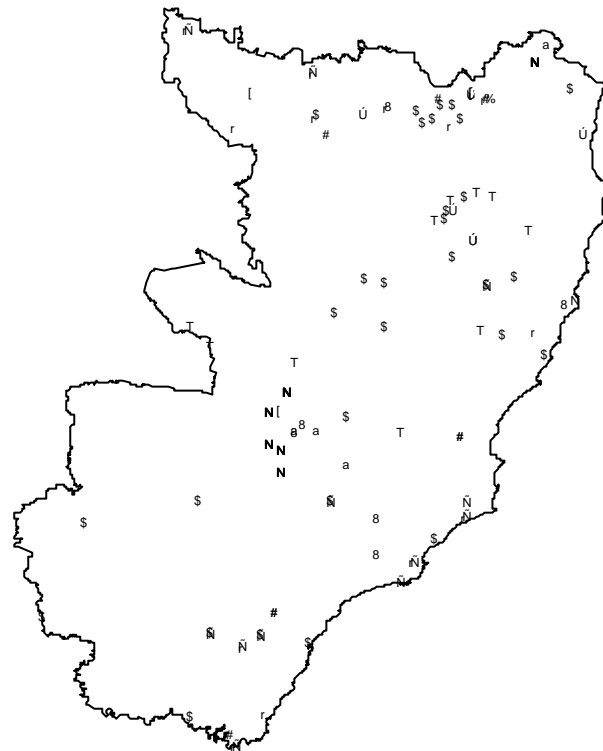
TYPE LOCALITIES

Herpetofauna:	<i>Egernia modesta</i>	
	<i>Lamprophilus caligula</i>	
	<i>Mixophes balbus</i>	
	<i>Phyloria sphagnicolus</i>	All 3 sites at Point Lookout, New England National Park
	<i>Litoria subglandulosa</i>	

Arachnids:	<i>Ixamatus fischeri</i> <i>Paraembolides montisbossi</i> <i>Prograndungula carraiensis</i> <i>Xamiatus kia</i> <i>Cethegus broomi</i> <i>Australothele bicuspidata</i> <i>Ixamatus musgravei</i>
Mammals:	<i>Antechinus swainsoni</i>
Threatened Plants:	<i>Grevillea shiressii</i> <i>Prostantera stricta</i> <i>Eucalyptus cannonii</i> <i>Allocasuarina defungens</i> <i>Allocasuarina simulans</i> <i>Bertya ingramii</i> <i>Gentiana wissmannii</i> <i>Neoastelia spectabilis</i>
Endangered Liverworts & Mosses	<i>Leptodontium viticulosoides</i> <i>Buxbaumia colyerae</i> <i>Frullaria streimannii</i>
Endangered Lichens	<i>Hypotrachyna booralensis</i> <i>Melanelia pseudoglabra</i> <i>Parmelina euplectina</i> <i>Xanthiparmelia heinari</i> <i>Relicina filsonii</i> <i>Menegazzia grandis</i>
Single Site for Insects	<ol style="list-style-type: none"> 1. <i>Australocyon variegatus</i>, <i>Barretthydrus geminatus</i>, <i>Barretthydrus tibialis</i>, <i>ceronocyton obscurum</i> 2. <i>Austrolimnius carus</i>, <i>Austrolimnius menopon</i>, <i>Austrolimnius thyas</i>, <i>Dinotoperla cobra</i> 3. <i>Australocyon variegatus</i>, <i>Cenebriophilus subcostatus</i>, <i>Ceronocyton obscurum</i> 4. <i>Australocyon variegatus</i>, <i>Austroaeshna sigma</i>, <i>Austroargiolestes christine</i>, <i>Leptoperla bubalus</i>, <i>Stenoperia wongoonoo</i> 5. <i>Australocyon variegatus</i>, <i>calomela relictata</i>, <i>Cenebriophilus subcostatus</i>, <i>Semelvillea acaciae</i>, <i>Semelvillea nothofagi</i> 6. <i>Amphistomus primonactus</i>, <i>Cheiloxena tuberosa</i>, <i>Demarziella scarpensis</i>, <i>Onthophagus kiambram</i>, <i>Onthophagus kumbaingeri</i>, <i>Semelvillea parva</i>, <i>Sternopriscus cervus</i>, <i>Argiolestes fontanus</i>,

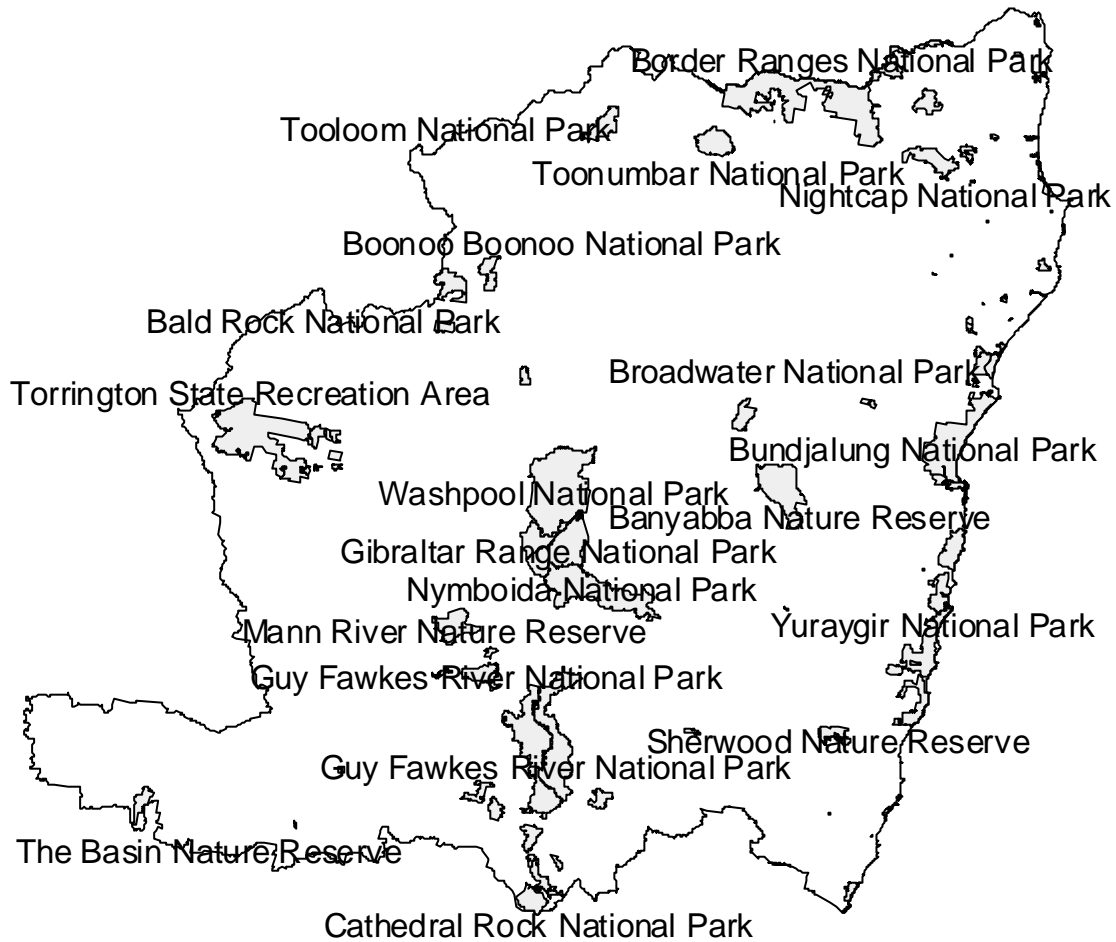
*Argiolestes griseus, Austrargiolestes amabilis, Austroargiolestes
icteromelas*

FIGURE 3: NATIONAL ESTATE VALUES – INDICATIVE AREAS – NATURAL HISTORY SITES CRITERION C.1 NORTHERN CRA REGION



- Northern CRA Region
- T Cave Fauna (Nth)
- a Endangered Mosses (Nth)
- b Endangered Lichens (Nth)
- l Herpetofauna (Nth)
- ú Arachnids (Nth)
- % Mammals (Nth)
- N Multiple Insect Type Locality (Nth)
- # Threatened Plants (Nth)
- r Research Sites (Nth)
- \$ Reference Sites (Nth)
- ñ Teaching Sites (Nth)

3.4 FAR NORTHERN CRA REGION



The above map shows the extent of the Far Northern CRA Region, and the National Parks and Nature Reserves within this region (data courtesy of NPWS).

The four types of site considered to meet the thresholds for National Estate Criteria C.1 are described in Table 5 and are mapped in Figure 4. Table 5 only describes sites that are considered to have high or moderate value i.e. low value sites are not included. There are 30

Type Localities, 11 Reference Sites, seven Teaching Sites and four Research Sites that are considered above the threshold for the criteria.

TABLE 5: Indicative Research, Teaching and Reference Sites and Type Localities considered to meet the threshold for National Estate Criteria C.1 within the Far Northern CRA Region. Summary of Information (greater detail in Appendix 5, see Site numbers).

SITE NAME AND LOCATION	SITE	REASONS FOR INCLUSION	RANKING	SELECTED REFERENCES
Wallaby Creek, Urbenville	Research	Macropod research studies since	High	Jarman et al, 1987
Site 2	Teaching	1974, Uni New England theses site	Moderate	
Clouds Creek - Site 47	Research	Long-term bird banding studies,	Moderate	Barnett et al, 1976 and 1978
	Teaching	small mammal studies, Uni New	Moderate	
	Reference	England under and postgraduate	Moderate	
Iluka Nature Reserve - Site 48	Research	Long-term bird banding studies,	Moderate	Moon and Lunney, 1990
		Koala studies, bush regeneration		
Tucki Tucki Nature Reserve	Research	Koala ecology studies	Moderate	Gall, 1980
Site 96				
Susan Island, Grafton - Site 49	Teaching	Community education; long-term	High	None known
Registered on National Estate	Reference	bird studies, flying-fox studies	Moderate	
Sheepstation Creek, Border	Teaching	Southern Cross University	Moderate	None known
Ranges NP - Site 92		undergraduate teaching site		
Brindle Creek, Border Ranges NP	Teaching	Southern Cross University	Moderate	None known
Site 93		undergraduate teaching site		
Bundjalung National Park - Site 94	Teaching	Southern Cross University	Moderate	None known
		undergraduate teaching site		
Station Creek, Yuraygir NP	Teaching	Southern Cross University	Moderate	None known
Site 95		undergraduate teaching site		
Northern NSW between Grafton	Reference	CSIRO fauna survey sites	Moderate	Catling and Burt, 1997
and Taree - Site 8				
Chaelundi State Forest - Site 43	Reference	Forest owl monitoring	Moderate	Debus, 1995
London Bridge SF - Site 43	Reference	Forest owl monitoring	Moderate	Debus, 1995
Coutts Crossing, Grafton - Site 46	Reference	Long-term bird studies	Moderate	G.Clancey reports
Bruxner Park, Booyong, Ballina	Reference	Long-term monitoring of flying-fox	Moderate	Lunney and Moon, 1997
Boatharbour, Billinudgel, Kyogle		maternity sites		
Terania Creek - Site 74				
Bucca Bucca Creek, Bruxner Park	Reference	Long-term monitoring of frog	High	M. Mahony reports
Flora Reserve - Site 77		populations		
Desert Creek, Washpool State	Reference	Long-term monitoring of frog	High	M. Mahony reports
Forest - Site 78		populations		
Long Creek, Border Ranges NP	Reference	Long-term monitoring of frog	High	M. Mahony reports

Site 79		populations		
Protestors Falls, Terania Creek	Reference	Long-term monitoring of frog	High	M. Mahony reports
Site 80		populations		
Mt Nardi, Goonimbar SF - Site 98	Research	Effects of logging on avifauna	Moderate	Harden et al, 1986

TYPE LOCALITIES

Herpetofauna:

Amphibolorus nobbi

Mixophyes iteratus

Litoria booroolongensis

Litoria castanea

Litoria lesueuri

Litoria chloris

Both species located on Richmond

Lechriodus fletcheri

River, at Dunoon

Arachnids:

Australothele nambucca

Ixamatus candidus

Ixamatus caldera

Mammals:

Antechinus stuartii

Chalinolobus dwyeri

Threatened Plants:

Grevillea beadleana

Boronia umbellata

Eucalyptus mckieana

Haloragis exalata

Corynocarpus rupestris ssp. *rupestris*

Olax angulata

Acacia ruppi

Hibbertia marginata

Corokia whiteana

Endiandra hayesii

Acronychia littoralis

Elaeocarpus williamsiansus

Lichens:

Pannaria crennulata

Single sites for:

1. *Argiolestes griseus*, *Austroargiolestes alpinus*, *Austroargiolestes*

Insects

icteromelas, *Notoaeschna geminata*

2. *Amphistomus speculifer*, *Amphistomus trispiculatus*,

Demarziella scarpensis, *Onthophagus kiambram*

3. *Australocyon nanus*, *Australocyon variegatus*, *Cenebriophilus*

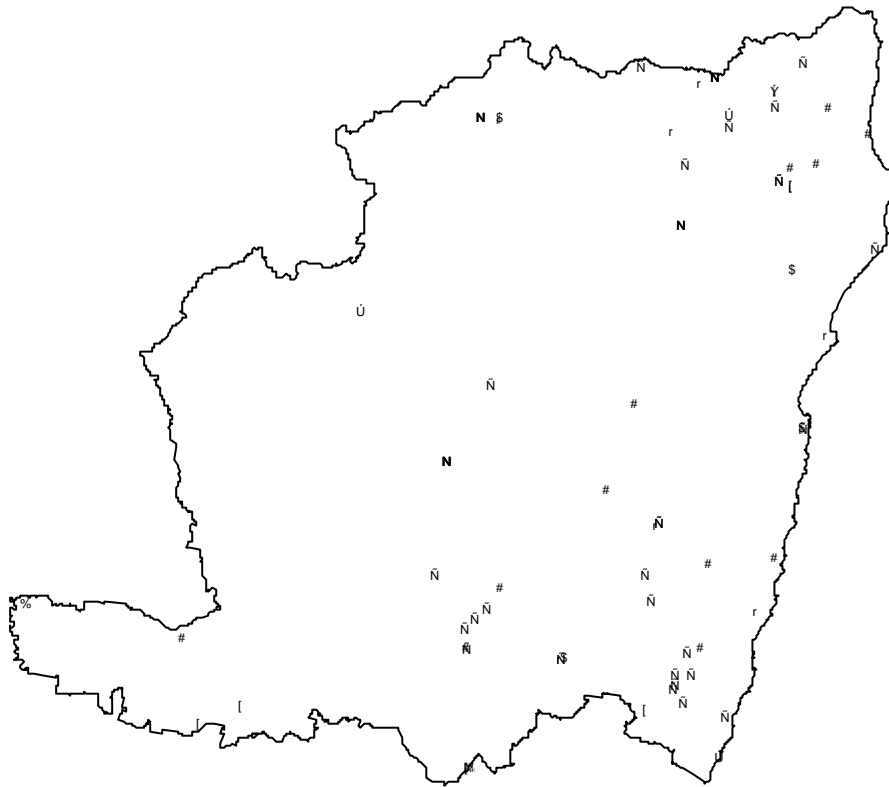
subcostatus, *Ceronocyton obscurum*, *Palophagus australiensis*

4. *Australocyon nanus*, *Australocyon variegatus*, *Cenebriophilus*

subcostatus, Pilocnema nigra

5. *Australocyon variegatus, Australocyon weiri, Ceronocyton
obscurum*

FIGURE 4: NATIONAL ESTATE VALUES – INDICATIVE AREAS – NATURAL HISTORY SITES CRITERION C.1 FAR NORTHERN CRA REGION



- Far North CRA
- Y Endangered Lichens (FN)
- I Herpetofauna (FN)
- U Arachnids (FN)
- \$ Research Sites (FN)
- N Reference Sites (FN)
- % Mammals
- N Multiple Insect Type Localities (FN)
- # Threatened Plants (FN)
- r Teaching Sites (FN)

4.0 SITES IMPORTANT FOR UNDERSTANDING AUSTRALIA'S NATURAL HISTORY WITHIN THE FOUR CRA REGIONS

The results of the assessment process used in this project provide locations for 220 sites that can be considered as important for the understanding of Australia's natural history on the basis of Criteria C.1. Further details about each Research, Teaching and Reference Site can be obtained from Appendix 5. The breakdown of the different type of C.1 sites and their distribution within the four CRA Regions is given in Table 6.

TABLE 6: C.1 SITES WITHIN THE FOUR STUDY AREAS

CRA REGION	RESEARCH SITES	TEACHING SITES	REFERENCE SITES	TYPE LOCALITIES	TOTAL
Eden	7	1	2	9	19
Southern	5	3	19	57	84
Northern	12	16	27	37	92
Far Northern	4	7	11	30	52
Total	28	27	59	133	247

The results in Table 6 provide an interesting picture of the distribution of C.1 sites in eastern NSW. As expected, there are far fewer sites within the Eden CRA Region. This is more because of size than the regions contribution to understanding natural history. Rather, there are sites within the Eden CRA that have contributed much to our understanding. In particular, the research undertaken at Nadgee Nature Reserve by CSIRO and others over more than 15 years has been outstanding. Added to this work is that by CSIRO, NPWS and State Forests in the adjoining forests e.g. Mumbulla, East Boyd and Yambulla State Forests.

The Southern CRA Region has not been as researched as the Eden CRA Region has, yet there are some sites of importance. These are mainly located within or near the ACT e.g. Brindabella, and are associated with university research or with groups based in Canberra. There are a large number of Type Localities in the Southern CRA Region (57). Many of the type specimens are associated with the higher altitude alpine areas, with Mount Kosciusko and surrounding region as an important collecting area. The number of Reference Sites in the Southern Region is deceptively low. If the survey sites established by CSIRO, State Forests and NPWS are added, then the number would be far higher. However, exact locations of these sites were difficult to obtain in the time of the project, and many of these sites were only used for 'one-off' surveys. For these reasons they were not included. Future examination of such sites could yield many more C.1 sites.

There has been a relatively large amount of research undertaken within the Northern CRA Region. This research has been associated with a variety of universities, government agencies

and non-government organisations. Perhaps the proximity of this diverse and biologically rich region to many of the large universities and cities (within a day's trip from Sydney, Newcastle, Armidale) has led to the amount of research undertaken. This association with universities is reflected in the large number of Teaching Sites in this Region, although some of the Teaching Sites are largely used for community education. The number of Type Localities is high and is mainly associated with collections on the Tablelands (Gloucester and Armidale districts). Although the number of Reference Sites is higher than that from other Regions, it would be higher if the 'one-off' survey sites were added (see Table 4).

Surprisingly, few Research Sites could be located for the Far Northern CRA Region. There were relatively high numbers of Reference Sites and Teaching Sites (mainly associated with Southern Cross University and Newcastle University). Perhaps the remoteness and inaccessibility of much of the Far Northern Region could explain this. Over time, it is expected that this will change, as there is greater research focus on this Region by Southern Cross University and other agencies. Two of the Research Sites have been established for many years – Wallaby Creek in the northern part of the Region (first surveyed for fauna by John Calaby, CSIRO, in the 1960's), and Cloud's Creek in the southern part of the Region. Cloud's Creek Forest Station has been used for forestry research since the 1970's, and is now used by the University of New England and bird banding groups. Most of the Type Localities are located within the eastern half of the Far Northern CRA Region i.e. within the coastal lowlands. This is possibly due to the accessibility of this part of the Region, with a greater number of scientists utilising this part. A similar pattern is seen with the distribution of Reference Sites i.e. most are located within the eastern part of the Region.

Of the 72 Research, Teaching and Reference Sites within the four CRA Regions that could be placed within an area of land ownership, 30 Sites are within State Forests, 23 are within National Parks and Nature Reserves³, 15 are on private land, three are in local reserves and three are in Travelling Stock Routes (Crown Land).

For most of the Research, Teaching and Reference Sites there is sufficient information to develop a nomination of each. Some require further information about boundaries, but many are within boundaries already documented e.g. Flora Reserves. Boundaries of other sites are also well described within research papers e.g. Forestry Compartments or stream catchment. The boundaries for some Teaching Sites are available from descriptions of these sites e.g. Newholme Field Laboratory. However, there is insufficient time in this project to acquire such information.

As this report is being written additional information about other sites is being acquired, as some responses to my correspondence are slower than others. This overview of C.1 Sites within the four Regions does not provide a full description of all sites capable of nomination to the Register of the National Estate, and it is hoped that any additional information will be incorporated into future assessments.

³ These are already listed on the Register, but this study provides additional information.

5.0 MANAGEMENT OF SITES

Sites proposed for listing on the Register of the National Estate would be associated with a certain level of management under the present Act. Management of listed sites is described in the legislation and other publications and need not be discussed in this report. Rather, it is important to provide some guidance to future management of C1 sites selected from the four CRA Regions.

1. The information about the sites described in this report is derived from published sources and from advice given by others. None of the sites have been inspected to derive an assessment of present condition or management. Several of the sites are part of a continuing research and/or monitoring process and their condition is well known. However, other sites are not used continually and changes in their use may change their status as listed sites. Localities of type specimens are only known from geographic references and a limited site description. Before any site could be listed, it will be necessary to undertake a site inspection to assess current land use, site condition and detailed site boundaries.
2. In the case of type localities, it may be important to establish whether the type species still occurs, or has the potential of occurring, at the site. Whether a type locality where there is little likelihood of the type species still occurring should be listed is a matter of further discussion.
3. The sites recommended in this report can be placed into three broad categories, based upon land ownership. The first category is those sites within the NPWS Estate i.e. within national parks and nature reserves. The second category is those sites within other Crown land, particularly State Forests, and the third category is those sites within private land. Site management would be different within each category.
4. Within each broad category there are different types of land use. In the Estate category there are State Recreation Areas, Historical Sites, Aboriginal Sites and Wilderness Areas. Each of these types of land use are managed differently. However, the overall management of sites within the Estate category would be aimed towards conservation.
5. Within the Crown land category there are also many different types of land use. Within the State Forests are Flora Preserves and other reserves that are managed for conservation. It is suggested that, overall, there is an obligation by the Crown to manage sites listed on the Register of the National Estate with an aim towards conservation. Other Crown lands include stream reserves and coastal wetlands, and this category should be expanded to include those areas of land under some sort of control by the Crown e.g. protected lands.
6. The sites within the Private land category would need to be managed in an “off-reserve” approach. Such an approach is currently in use by many conservation agencies realising that not all land worthy of conservation can be conserved within reserves. The role of the Australian Heritage Commission is important here, as they are the main agency promoting this approach to the management of listed sites.
7. The use of each site will also influence the type of management. Research sites may need no further management, as the research activity and the custodian of the research may already manage the site. This would be particularly so in the case of research into changes

due to past and present impacts e.g. fire research, forestry research. Again, many Teaching sites may also be managed by the custodians e.g. ANU Field Station, Newholme Field Laboratory. Reference sites may not need to be managed if they are 'one-off' or short-term sites, but would need to be protected if they are long-term monitoring sites. The management of Type Localities may be dependant upon the degree of importance of the species, the likelihood of the species still occurring at the site, and the present condition of the site.

APPENDIX 1: LISTS OF INSECT TYPE LOCALITIES (Supplied by CSIRO Division of Entomology); TYPE LOCALITIES OF ENDANGERED MOSSES AND LIVERWORTS; ENDANGERED LICHENS; MAMMALS; THREATENED PLANTS; HERPETOFAUNA AND ARACHNIDA

Insect Species	Latitude	Longitude	Place
<i>Botryocladus collessi</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Botryocladus collessi</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Botryocladus collessi</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Botryocladus grapeth</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Cricotopus conicornis</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Cricotopus hillmani</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Pirara australiensis</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Pirara australiensis</i>	-36.6	149.4167	Brown Mt, Rutherford Ck
<i>Chalcolampra walgalu</i>	-36.45	148.2667	Mount Kosciusko
<i>Chalcolampra walgalu</i>	-36.45	148.2667	Mount Kosciusko
<i>Archichauliodes anagaurus</i>	-36.45	148.2667	Mount Kosciusko
<i>Archichauliodes anagaurus</i>	-36.45	148.2667	Mount Kosciusko
<i>Archichauliodes anagaurus</i>	-36.45	148.2667	Mount Kosciusko
<i>Austroargiolestes calcaris</i>	-36.45	148.2667	Mount Kosciusko
<i>Austroargiolestes calcaris</i>	-36.45	148.2667	Mount Kosciusko
<i>Telephlebia brevicauda</i>	-36.45	148.2667	Mount Kosciusko
<i>Acruroperla atra</i>	-36.45	148.2667	Mount Kosciusko
<i>Acruroperla atra</i>	-36.45	148.2667	Mount Kosciusko
<i>Acruroperla atra</i>	-36.45	148.2667	Mount Kosciusko
<i>Leptoperla cacuminis</i>	-36.45	148.2667	Mount Kosciusko
<i>Microdonacia grevilleae</i>	-36.4333	148.3167	Charlottes Pass, Kosciusko NP
<i>Austrocercella alpina</i>	-36.4333	148.3167	Charlottes Pass, Kosciusko NP
<i>Riekoperla hynesorum</i>	-36.4333	148.3167	Charlottes Pass, Kosciusko NP
<i>Microdonacia grevilleae</i>	-36.4167	148.3167	Charlottes Pass, Kosciusko NP
<i>Microdonacia grevilleae</i>	-36.4167	148.3167	Charlottes Pass, Kosciusko NP
<i>Austrodictes monticolus</i>	-36.4167	148.3167	Charlottes Pass, Kosciusko NP
<i>Austrocercella nivalis</i>	-36.4167	148.3167	Charlottes Pass, Kosciusko NP
<i>Austrocercella nivalis</i>	-36.4167	148.3167	Charlottes Pass, Kosciusko NP
<i>Austrolimnius anytus</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrolimnius keyi</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrolimnius keyi</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrolimnius maro</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrolimnius miletus</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrodictes monticolus</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrodictes monticolus</i>	-36.3833	148.4333	Prussian Ck, Kosciusko NP
<i>Austrocercella alpina</i>	-36.3667	148.4	Perisher Ck, Kosciusko NP
<i>Austrocercella autumnalis</i>	-36.3667	148.4	Perisher Ck, Kosciusko NP
<i>Austrocercella autumnalis</i>	-36.3667	148.4	Perisher Ck, Kosciusko NP
<i>Leptoperla curvata</i>	-36.3667	148.4	Perisher Ck, Kosciusko NP
<i>Riekoperla hynesorum</i>	-36.3667	148.4	Perisher Ck, Kosciusko NP
<i>Chlorodectes montanus</i>	-36.35	148.5667	Thredbo R, Jindabyne
<i>Austrocercella alpina</i>	-36.35	148.5667	Thredbo R, Jindabyne
<i>Riekoperla montana</i>	-36.35	148.5667	Thredbo R, Jindabyne
<i>Riekoperla montana</i>	-36.35	148.5667	Thredbo R, Jindabyne
<i>Riekoperla montana</i>	-36.35	148.5667	Thredbo R, Jindabyne
<i>Austrocercella alpina</i>	-35.9167	148.5833	Alpine Ck, Kiandra
<i>Dinotoperla christinae</i>	-35.9167	148.5833	Alpine Ck, Kiandra
<i>Riekoperla montana</i>	-35.9167	148.5833	Alpine Ck, Kiandra
<i>Austrolimnius anytus</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Austrolimnius maro</i>	-35.9	148.5833	Alpine Ck, Kiandra

<i>Austrolimnius maro</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Austrocercella alpina</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Austrocercella alpina</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Austrocercella autumnalis</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Riekoperla montana</i>	-35.9	148.5833	Alpine Ck, Kiandra
<i>Austrocercella illiesi</i>	-35.8667	148.5	Eucumbene R, E of Kiandra
<i>Austrocercella verna</i>	-35.8667	148.5	Eucumbene R, E of Kiandra
<i>Austrocercella verna</i>	-35.8667	148.5	Eucumbene R, E of Kiandra
<i>Riekoperla compressa</i>	-35.8667	148.5	Eucumbene R, E of Kiandra
<i>Stenoperla kuna</i>	-35.8667	148.5	Eucumbene R, E of Kiandra
<i>Austrocercella illiesi</i>	-35.8667	148.5333	Eucumbene R, E of Kiandra
<i>Dinotoperla eucumbene</i>	-35.8667	148.5333	Eucumbene R, E of Kiandra
<i>Leptoperla bifida</i>	-35.8667	148.5333	Eucumbene R, E of Kiandra
<i>Riekoperla karki</i>	-35.8667	148.5333	Eucumbene R, E of Kiandra
<i>Austrolimnius alcine</i>	-35.7833	150.15	Near Mogo
<i>Austrolimnius nomia</i>	-35.7833	150.15	Near Mogo
<i>Austrolimnius waterhousei</i>	-35.7833	150.15	Near Mogo
<i>Amphistomus speculifer</i>	-35.55	149.95	Clyde Mt, summit
<i>Amphistomus speculifer</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Australocyon variegatus</i>	-35.55	149.95	Clyde Mt, summit
<i>Microdonacia eucryphiae</i>	-35.55	149.95	Clyde Mt, summit
<i>Microdonacia eucryphiae</i>	-35.55	149.95	Clyde Mt, summit
<i>Microdonacia eucryphiae</i>	-35.55	149.95	Clyde Mt, summit
<i>Austrolimnius codrus</i>	-35.4833	149.9167	Wattambucca Ck
<i>Austrolimnius fallax</i>	-35.4833	149.9167	Wattambucca Ck
<i>Austrolimnius fallax</i>	-35.4833	149.9167	Wattambucca Ck
<i>Austrolimnius resa</i>	-35.4667	149.9167	Wattambucca Ck
<i>Austrolimnius sulmo</i>	-35.4667	149.9167	Wattambucca Ck
<i>Austrolimnius waterhousei</i>	-35.4667	149.9167	Wattambucca Ck
<i>Austrolimnius waterhousei</i>	-35.4667	149.9167	Wattambucca Ck
<i>Austrolimnius caicus</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius nicon</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius nicon</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius olenus</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius opis</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius opis</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius waterhousei</i>	-34.75	149.7167	Wollondilly R, near Goulburn
<i>Austrolimnius isus</i>	-33.7167	150.3667	Wentworth Falls
<i>Austrolimnius isus</i>	-33.7167	150.3667	Wentworth Falls
<i>Austrolimnius mackerrasi</i>	-33.7167	150.3667	Wentworth Falls
<i>Austrolimnius mackerrasi</i>	-33.7167	150.3667	Wentworth Falls
<i>Austrolimnius sulmo</i>	-33.7167	150.3667	Wentworth Falls
<i>Austrolimnius sulmo</i>	-33.7167	150.3667	Wentworth Falls
<i>Pseudohydrobius flavus</i>	-33.7167	150.3667	Wentworth Falls
<i>Pseudohydrobius flavus</i>	-33.7167	150.3667	Wentworth Falls
<i>Austroargiolestes isabellae</i>	-33.7167	150.3667	Wentworth Falls
<i>Dinotoperla pseudodolichoprocta</i>	-33.7167	150.3667	Wentworth Falls

<i>Dinotoperla pseudodolichoprocta</i>	-33.7167	150.3667 Wentworth Falls
<i>Platynectes laurianus</i>	-33.7167	151.1167 Wahroonga
<i>Argiolestes griseus</i>	-33.7167	151.1167 Wahroonga
<i>Austroargiolestes isabellae</i>	-33.7167	151.1167 Wahroonga
<i>Australphilus montanus</i>	-33.65	151.05 Galston
<i>Austrolimnius luridus</i>	-33.65	151.05 Galston
<i>Polyoptilus irregularis</i>	-33.65	151.05 Galston
<i>Nasutitermes walkeri</i>	-33.65	151.05 Galston
<i>Australocyon variegatus</i>	-32.2667	151.5 Upper Allyn Valley, near Eccleston
<i>Barretthydrus geminatus</i>	-32.2667	151.5 Upper Allyn Valley, near Eccleston
<i>Barretthydrus tibialis</i>	-32.2667	151.5 Upper Allyn Valley, near Eccleston
<i>Ceronocyton obscurum</i>	-32.2667	151.5 Upper Allyn Valley, near Eccleston
<i>Austrolimnius carus</i>	-32.1667	151.5 Allyn R., near Eccleston
<i>Austrolimnius menopon</i>	-32.1667	151.5 Allyn R., near Eccleston
<i>Austrolimnius thyas</i>	-32.1667	151.5 Allyn R., near Eccleston
<i>Dinotoperla cobra</i>	-32.1667	151.5 Allyn R., near Eccleston
<i>Dinotoperla cobra</i>	-32.1667	151.5 Allyn R., near Eccleston
<i>Australocyon variegatus</i>	-32.1333	151.45 Allyn R., Chichester SF
<i>Cenebriophilus subcostatus</i>	-32.1333	151.45 Allyn R., Chichester SF
<i>Cenebriophilus subcostatus</i>	-32.1333	151.45 Allyn R., Chichester SF
<i>Ceronocyton obscurum</i>	-32.1333	151.45 Allyn R., Chichester SF
<i>Ceronocyton obscurum</i>	-32.1333	151.45 Allyn R., Chichester SF
<i>Australocyon variegatus</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Australocyon variegatus</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Austroaeschna sigma</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Austroargiolestes christine</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Leptoperla bubalus</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Stenoperla wongoonoo</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Stenoperla wongoonoo</i>	-31.9833	151.45 Lagoon Plach, Barrington Tops
<i>Australocyon variegatus</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Calomela relictata</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Calomela relictata</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Calomela relictata</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Calomela relictata</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Cenebriophilus subcostatus</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea acaciae</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea acaciae</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea acaciae</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea acaciae</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea nothofagi</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Semelvillea nothofagi</i>	-31.8833	151.5333 Cobark Forest Park, Barrington Tops
<i>Argiolestes griseus</i>	-30.4	152.35 Ebor
<i>Austroargiolestes alpinus</i>	-30.4	152.35 Ebor
<i>Austroargiolestes icteromelas</i>	-30.4	152.35 Ebor
<i>Notoaeschna geminata</i>	-30.4	152.35 Ebor
<i>Austrogomphus amphiclitus</i>	-29.9167	150.3 Caroda
<i>Austrogomphus cornutus</i>	-29.9167	150.3 Caroda
<i>Diphlebia nymphoides</i>	-29.9167	150.3 Caroda
<i>Pseudagrion aureofrons</i>	-29.9167	150.3 Caroda
<i>Australocyon variegatus</i>	-28.3667	153.0833 Wiangaree SF, 33km NE Wiangaree
<i>Australocyon variegatus</i>	-28.3667	153.0833 Wiangaree SF, 33km NE Wiangaree
<i>Australocyon variegatus</i>	-28.3667	153.0833 Wiangaree SF, 33km NE Wiangaree

Australocyon weiri	-28.3667	153.0833	Wiangaree SF, 33km NE Wiangaree
Ceronocyton obscurum	-28.3667	153.0833	Wiangaree SF, 33km NE Wiangaree

ENDANGERED MOSSES AND LIVERWORTS	LATITUDE	LONGITUDE
<i>Bryostreimannia turgida</i>	-35.52	148.92
<i>Bryum perlimbatum</i>	-36.42	148.53
<i>Leptodontium viticulosoides</i>	-32.07	151.57
<i>Orthotrichum cupulatum</i>	-35.12	148.68
<i>Buxbaumia colyerae</i>	-32.23	151.82
<i>Austrolejeunea bidentata</i>	-35.55	149.92
<i>Frullania streimannii</i>	-32.07	151.68
<i>Frullania streimannii</i>	-30.25	152.78

MAMMAL SPECIES	LATITUDE	LONGITUDE
<i>Antechinus stuartii</i>	-30.40	152.35
<i>Antechinus swainsonii</i>	-30.50	152.50
<i>Antechinus agilis</i>	-35.36	148.84
<i>Isoodon obesulus</i>	-33.60	151.27
<i>Burramys parvus</i>	-34.32	149.98
<i>Rhinlophus megaphyllus</i>	-35.00	148.65
<i>Chalinolobus dwyeri</i>	-29.92	151.02
<i>Eptesicus sagittula</i>	-35.35	149.73

HERPETOFAUNA	LOCALITY	LATITUDE	LONGITUDE
<i>Underwoodisaurus sphyrurus</i>	Tumut	-35.30	148.22
<i>Aprasia parapulchella</i>	Coppins Crossing, Molonglo R.	-36.32	149.98
<i>Amphibolurus nobbi</i>	24 mi ENE Guyra	-30.22	151.67
<i>Egernia modesta</i>	Yarrowyck, 20mi W Armidale	-30.47	151.37
<i>Hemiergis decresiensis</i>	Talbingo	-35.57	148.30
<i>Lampropholis caligula</i>	Pol Blue, Barrington Tops	-31.98	151.50
<i>Lampropholis mustelina</i>	Mt Victoria	-33.58	150.25
<i>Pseudemoia spenceri</i>	Mt Kosciusko	-36.45	148.27
<i>Sphenomorphus kosciuskoi</i>	Mt Kosciusko 5,000ft	-36.45	148.27
<i>Austrelaps superbus</i>	Braidwood; Sutton Forest	-35.45	149.80
<i>Heleioporus australiacus</i>	Mt Victoria	-33.58	150.25
<i>Lechriodus fletcheri</i>	Dunoon, Richmond River	-28.68	153.32
<i>Limnodynastes dumerilii</i>	9.6km NE Thredbo Village	-36.50	148.32
<i>Mixophyes balbus</i>	Point Lookout, New England NP	-30.48	152.42
<i>Mixophyes iteratus</i>	Mt Warning	-28.40	153.27
<i>Phyllorhina sphagnicolus</i>	Point Lookout, New England NP	-30.48	152.42
<i>Litoria aurea</i>	Macquarie River, Bathurst	-33.42	149.58
<i>Litoria booroolongensis</i>	Guy Fawkes Creek, Ebor	-30.40	152.35
<i>Litoria castanea</i>	Booralong Creek Rd, 12.8km W Guyra	-30.27	151.55
<i>Litoria chloris</i>	Dunoon, Richmond River	-28.68	153.32
<i>Litoria subglandulosa</i>	Point Lookout, New England NP	-30.48	152.42
<i>Litoria tyleri</i>	Ryan's Swamp, Caves Beach Reserve, Jervis Bay	-35.05	150.67
<i>Litoria verreauxii</i>	Mt Kosciusko	-36.45	148.27
<i>Litoria lesueuri</i>	Ulong	-30.23	152.88

ENDANGERED LICHENS	LATITUDE	LONGITUDE
<i>Neophyllis pachyphylla</i>	-35.35	150.27
<i>Anzia tianjarana</i>	-35.18	150.30
<i>Bulbothrix subtabacina</i>	-35.73	150.25
<i>Chondropis solediosa</i>	-36.28	149.22
<i>Hypotrachyna booralensis</i>	-32.48	151.97
<i>Imshaugia evernica</i>	-35.35	149.23
<i>Melanelia pseudoglabra</i>	-30.53	152.03
<i>Neofuscelia imitatricoides</i>	-35.12	150.08
<i>Neofuscelia parasitica</i>	-35.28	149.28
<i>Paraparmelia columbariensis</i>	-35.35	150.27
<i>Paraparmelia neomongaensis</i>	-35.35	150.27
<i>Paraparmelia yamblaensis</i>	-35.67	147.03
<i>Parmelia crowii</i>	-36.58	150.07
<i>Parmelia protosulcata</i>	-35.55	149.92
<i>Parmelina euplectina</i>	-32.65	151.97
<i>Parmelina johnstoniae</i>	-35.67	150.00
<i>Parmotrema convolutum</i>	-35.58	149.45
<i>Xanthoparmelia austroconstrictans</i>	-35.12	150.08
<i>Xanthoparmelia canobolasensis</i>	-33.35	148.98
<i>Xanthoparmelia heinari</i>	-31.47	152.87
<i>Xanthoparmelia hyposalazinic</i>	-35.28	149.22
<i>Xanthoparmelia metastrigosa</i>	-33.35	148.98
<i>Xanthoparmelia nigrocephala</i>	-36.45	148.27
<i>Xanthoparmelia sublumenosa</i>	-35.28	149.22
<i>Xanthoparmelia subpigmentosa</i>	-35.87	148.50
<i>Anzia minor</i>	-35.12	150.08
<i>Hypotrachyna lividescens</i>	-35.73	150.22
<i>Paraparmelia gregaria</i>	-35.58	149.92
<i>Parmelia protosignifera</i>	-35.73	149.28
<i>Parmelinopsis jamesii</i>	-35.58	149.92
<i>Relicina filsonii</i>	-32.03	151.62
<i>Xanthoparmelia burmeisteri</i>	-36.52	149.28
<i>Xanthoparmelia segregata</i>	-35.25	149.45
<i>Menegazzia grandis</i>	-32.07	151.57
<i>Pannaria crenulata</i>	-28.40	153.27

THREATENED PLANT NAME	LATITUDE	LONGITUDE
<i>Eucalyptus imlayensis</i>	-37.1800	149.7300
<i>Grevillea acanthifolia</i> ssp. <i>paludosa</i>	-37.0900	149.4000
<i>Phebalium rhytidophyllum</i>	-37.0900	149.4200
<i>Genoplesium rhyoliticum</i>	-36.9300	149.8700
<i>Acacia georgensis</i>	-36.6700	149.9000
<i>Pomaderris parrisiae</i>	-36.5800	149.4500
<i>Gentiana bredboensis</i>	-35.9700	149.4200
<i>Pomaderris gilmourii</i>	-35.9300	149.9000
<i>Eucalyptus kartzoffiana</i>	-35.6500	149.8200
<i>Stipa metatoris</i>	-34.9700	148.5300
<i>Grevillea molyneuxii</i>	-34.7000	150.1700
<i>Pterostylis pulchella</i>	-34.6300	150.4700
<i>Grevillea rivularis</i>	-34.6300	150.6800
<i>Gentiana wingecarribiensis</i>	-34.5700	150.5200
<i>Persoonia bargoensis</i>	-34.2000	150.7000
<i>Bossiaea oligosperma</i>	-34.1000	150.2300
<i>Leptospermum deanei</i>	-33.7600	150.0800
<i>Allocasuarina glareicola</i>	-33.7500	150.6800
<i>Persoonia mollis</i>	-33.6700	151.1500
<i>Kunzea rupestris</i>	-33.5200	151.0700
<i>Grevillea shiressii</i>	-33.5000	151.2700
<i>Diuris praecox</i>	-32.9700	151.7700
<i>Prostanthera stricta</i>	-32.9200	151.4800
<i>Eucalyptus cannonii</i>	-32.9200	151.4800
<i>Prostanthera discolor</i>	-32.4000	150.2200
<i>Allocasuarina defungens</i>	-32.1000	152.3800
<i>Allocasuarina simulans</i>	-32.1000	152.3800
<i>Bertya ingramii</i>	-30.6700	151.7300
<i>Gentiana wissmannii</i>	-30.5000	152.2700
<i>Neoastelia spectabilis</i>	-30.5000	152.5000
<i>Grevillea beadleana</i>	-30.0500	152.3500
<i>Boronia umbellata</i>	-30.0500	153.0500
<i>Eucalyptus mckieana</i>	-30.0200	151.5000
<i>Haloragis exalata</i>	-29.8700	152.4500
<i>Corynocarpus rupestris</i> ssp. <i>rupestris</i>	-29.8000	153.0700
<i>Olax angulata</i>	-29.7800	153.2700
<i>Acacia ruppi</i>	-29.5800	152.7700
<i>Hibbertia marginata</i>	-29.3300	152.8500
<i>Fontainea oraria</i>	-28.8000	153.6000
<i>Corokia whiteana</i>	-28.6300	153.3200
<i>Endiandra hayesii</i>	-28.6200	153.4000
<i>Acronychia littoralis</i>	-28.5300	153.5500
<i>Elaeocarpus williamsianus</i>	-28.4500	153.4300

ARACHNIDA	LOCATION	LATITUDE	LONGITUDE
<i>Homogona pulleinei</i>	Lismore	-37.95	143.35
<i>Misgolas biroi</i>	Mt Victoria	-33.58	150.25
<i>Misgolas elegans</i>	Kaianga, Narooma	-36.22	150.15
<i>Misgolas robertsi</i>	Minnamurra Falls, Kiama	-34.63	150.85
<i>Aname minor</i>	Mt Victoria	-33.58	150.25
<i>Australothele bicuspidata</i>	Point Lookout, New England NP	-30.48	152.42
<i>Australothele nambucca</i>	Sawtell	-30.37	153.1
<i>Cethegus broomi</i>	Hillgrove	-30.57	151.9
<i>Ixamatus candidus</i>	Poverty Point, Tenterfield	-29.05	152.03
<i>Ixamatus caldera</i>	Bar Mt, Kyogle	-28.47	153.13
<i>Ixamatus fischeri</i>	Mt Banda Banda Beech Reserve	-31.17	152.43
<i>Ixamatus musgravei</i>	Point Lookout, New England NP	-30.48	152.42
<i>Kiama lachrymoides</i>	Kiama	-34.67	150.85
<i>Namirea fallax</i>	Bilpin	-33.5	150.52
<i>Xamiatus kia</i>	Newee Creek Rd via Macksville	-30.67	152.95
<i>Atrax formidabilis</i>	Antonio, near Rydal	-33.53	150.03
<i>Atrax moreau</i>	Antonio, near Rydal	-33.53	150.03
<i>Paraembolides boydi</i>	Mt Edwards, Boyd Plateau	-30.87	144.65
<i>Paraembolides brindabella</i>	W of Wyora, Tumut	-35.28	148.7
<i>Paraembolides montisbossi</i>	Mt Banda Banda Beech Reserve	-31.17	152.43
<i>Paraembolides variabilis</i>	Bilpin	-33.5	150.52
<i>Prograndungula carraiensis</i>	Carrai Bat Cave, 60km W Kempsey	-31.03	152.33
<i>Lycosa kosciuskoensis</i>	Lake Albina, Mt Kosciusko	-36.45	148.27
<i>Lycosa musgravei</i>	Mt Kosciusko	-36.45	148.27
<i>Lycosa summa</i>	Mt Kosciusko	-36.45	148.27
<i>Eterosonycha alpina</i>	Mt Kosciusko	-36.45	148.27
<i>Protochelifer cavernarum</i>	Timor Caves, Belfry Cave, Timor	-31.68	151.13
<i>Sundochrnes guanophilus</i>	Fig Tree Cave, Wombeyan	-34.32	149.98
<i>Paraliochthonius cavicola</i>	The Grill Cave, Bungonia	-34.83	150.07
<i>Pseudotyrannochthonius bornemisszai</i>	Edith	-33.12	149.92
<i>Sathrochthonius crassidens</i>	Edith	-33.12	149.92

APPENDIX 2: LOCATION OF CAVES IN EASTERN NSW AND CAVES SAMPLED FOR FAUNA

1. CAVES IN EASTERN NSW

Cave Name	Longitude	Latitude
1 Abercrombie	149.37	-33.92
3 Ashford	150.58	-29.22
4 Bakers Swamp	148.93	-32.75
5 Bendethera	149.67	-35.92
7 Billys Creek	150.17	-34.17
9 Borenore	148.92	-33.25
11 Bungonia	150.07	-34.83
13 Canomodine	148.67	-33.5
18 Cheitmore	149.67	-35.67
19 Church Creek	150.17	-34.17
20 Cliefden	148.92	-33.58
21 Colong	150.17	-34.17
22 Comboyne	152.47	-31.6
24 Cooleman Plain	148.67	-35.58
26 Crawney Pass	151.08	-31.58
30 Deua	149.67	-35.83
33 Finches Caves	149.05	-32.92
36 Gloucester	152.08	-32.08
42 Jaunter	149.92	-33.92
43 Jenolan	150.03	-33.82
47 Jounama Creek	148.42	-35.58
50 Kunderang Brook	152.25	-31.08
52 Limekilns	149.83	-33.33
53 Little Wombeyan Cave	150	-34.25
58 Marble Arch	149.75	-35.75
62 Moparabah	152.52	-30.97
63 Mount Fairy	149.58	-35.17
70 Pigna Barney	151.58	-31.75
76 Stockyard Creek	152.32	-30.98
78 Sulcor	150.83	-30.83
80 Talmo	148.58	-34.92
81 Timor	151.17	-31.67
83 Tuglow	150	-34
84 Walli	148.92	-33.58
86 Wee Jasper	148.67	-35.08
89 Willi Willi	152.45	-30.95
91 Wombeyan	149.98	-34.32
93 Yarrangobilly	148.5	-35.72
94 Yessabah	152.7	-31.12

2. CAVES SAMPLED FOR FAUNA (Eberhard and Spate, 1995)

CAVES SURVEYED FOR INSECTS	NO.TAXA
Abercrombie	36
Ashford	25
Bakers Swamp	8
Bendethera	12
Billys Creek	30
Borenore	31
Bungonia	25
Canomodine	21
Cleatmore	16
Church Creek	11
Cliefden	28
Colong	19
Comboyne	35
Cooleman Plain	25
Crawney Pass	16
Deua	18
Finches Caves	11
Gloucester Caves	56
Jaunter	41
Jenolan	67
Kunderang Brook	20
Limekilns	10
Little Wombeyan Cave	15
Marble Arch	14
Moparrabah	42
Mount Fairy	31
Pigna Barney	24
Stockyard Creek	93
Sulcor	13
Talmo	12
Timor	38
Tuglo	19
Walli	24
Wee Jasper	53
Willi Willi	62
Wombeyan	53
Yarrangobilly	33
Yessabah	42

APPENDIX 3: LETTER SENT

**“Oorong”
Bathurst Road
OBERON, N.S.W., 2787**

**Phone: 02-63362244
Fax: 02-63362244
Mobile: 018-645592
e-mail:mtking@ozemail.com.au**

March, 1998

To:

Dear ,

As discussed on the phone today, I have been asked by the Environment Forest Taskforce, Environment Australia, to identify places of National Estate value within the N.S.W. Comprehensive Regional Assessment (CRA) forest regions. It is necessary under the National Forest Policy Statement that an assessment is required of the National Estate values relating to Research Sites, Teaching Sites, Reference or Benchmark Sites in the NSW CRA Regions.

The assessment is based upon National Estate Criteria C1, which assesses places on the basis of:

“Importance for information contributing to wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, Type locality, reference or benchmark site”.

Apart from searching data-bases and the literature for relevant information, I am seeking information from individuals within research institutes, universities and natural history societies. In particular, I am seeking information about long-term research and study sites. To date, most of these sites have been not been fully acknowledged as providing important information about Australian natural history. I believe this project provides an opportunity for these sites to be placed on the Register of the National Estate.

The information I will require will be some or all of the following (the more information obtained the easier to assess the site’s values and to nominate the site):

Location

Boundaries of the site

Use of the site (teaching/research/monitoring)

How long has the site been utilized

Researchers/teachers using the site

Information obtained from site (research projects, teaching subject)

Any publications resulting from studies at the site

Contact name(s) of persons responsible for the site e.g. caretaker, researcher/teacher using site

-2-

I will contact you about this request, and can visit you to obtain details.

I hope you can be of assistance, either by providing information about your involvement in such places, and/or can provide me with contact names of others that are associated with these types of places.

Thanking you in anticipation

Martin Denny

APPENDIX 4: PEOPLE AND ORGANISATIONS CONTACTED

Australian National Insect Collection (S.Shattuck)
Canberra Ornithologists Group (P.Fennell)
NSW Field Ornithologists Club (E.Karplus)
NSW FOC/Gould's League (A.Morris)
NSW Bird Atlassers (R.Cooper, I.McAllan)
Australian Museum
University of New England (H. Ford, S.Debus, P.Jarman, N.Reid)
University of Wollongong (R.Whelan)
Birds Australia (S.Ambrose)
Birds Australia (Southern NSW and ACT Group) (Phil Straw, Peter West, Alan Leishman)
Birds Australia (Northern NSW Group) (Andrew Ley)
CSIRO Division of Wildlife and Ecology (R.Schodde, S.Morton, C.Margules, M.Austin, P.Catling, A.Newsome, W.Braithwaite)
Australian National University (C.Tideman, M.Tanton)
University of Canberra (W.Osborne)
Southern Cross University (P.Baverstock, R.Goldengay)
University of Sydney (C.Dickman, R.Shine)
State Forests of NSW (R.Kavanagh, D.Binns)
University of Newcastle (M.Mahony)
Royal Botanical Gardens (J.Benson)
Macquarie University (J.Pickard, A.York)
CSIRO Division of Entomology (I.Reid)
Australian Bird Banding Scheme (B.Dettman)
National Trust of Australia (NSW) (R.Lembit)
NSW NPWS (D.Lunney, P.Wilson, A.Spate, B.Gilligan, R.Mezzatesta)
Australian Bat Society
Harry Recher
Tony Saunders
John Disney
Ernie Hoskin
Armstrong Osborne
R. and N. Pallin
Glenn Hoyer
Robert Harden

APPENDIX 5: LOCATION AND OTHER DETAILS ABOUT SITES WITHIN THE FOUR CRA REGIONS

SITES 1a,1b,1c

LOCALITY: Myall Lakes NP, south and west of Seal Rocks 32 41S/152 09E, 32 28'S/154 24'E and 32 28S/152 30E and 32 30S/152 30E (Hawks Nest)

LAND USE: National Park

RESEARCH: Changes to vegetation and mammal succession due to fire.

TEACHING: Several theses

REFERENCES: Fox, B.J. and G.M.McKay 1977 Recolonisation of open forest by small mammals after fire. Bull.Aust Mamm.Soc. No.4, 25

Aust.J.Bot. 27:157-165

Fox, B.J. and M.D.Fox 1978 Recolonisation of coastal heath by *Pseudomys novaehollandiae* following sand mining Aust.L Ecol. 3: 447-465

Fox, B.J. and M.D.Fox 1984 Small mammal recolonisation of open-forest following sand mining. Aust.J.Ecol. 9:241-252

Fox, B.J. and M.D.Fox 1986 The effect of fire frequency on the structure and floristic composition of a woodland understorey Aust.J.Ecol. 11:77-85

Fox, M.D. 1981 Coexistence between eucalypts in a coastal open forest. PhD thesis, Macquarie University

Fox, M.D. 1988 Understorey changes following fire at Myall Lakes, NSW Cunninghamia 2:

Jia, Luo, B.J.Fox and E.Jeffreys 1994 Diet of the Eastern Chestnut Mouse I. Composition, Diversity and Individual Variation. Wildl.Res. 21: 401-417

Jia, Luo, and B.J.Fox 1994 Diet of the Eastern Chestnut Mouse II. Seasonal and Successional Patterns Wildl.Res. 21: 419-431

Fox, B.J., P.Higgs and J.Luo 1993 Extension of the breeding season of the New Holland Mouse: a response to above-average rainfall. Wildl.Res. 20: 599-605

Luo, J. and B.J.Fox 1996 Seasonal and successional dietary shifts of two sympatric rodents in coastal heathland: a possible mechanism for coexistence. Aust.J.Ecol. 21: 121-132

Haering, R. and B.J.Fox 1995 Habitat utilization patterns of sympatric populations of *Pseudomys gracilicaudatus* and *Rattus lutreolus* in coastal heathland: a multivariate analysis Aust J. Ecol. 20: 427-441

Haering, R. and B.J.Fox 1997 Habitat use by sympatric populations of *Pseudomys gracilicaudatus* and *Mus domesticus* in coastal heathland Aust.J.Ecol. 22: 69-80

Luo, J. and B.J.Fox 1995 Competitive effects of *Rattus lutreolus* presence on food resource use by *Pseudomys gracilicaudatus* Aust J. Ecol. 20: 556-564

Higgs, P. and B.J.Fox 1993 Interspecific competition: a mechanism for rodent succession after fire in wet heathland Aust.J.Ecol. 18: 193-201

Monamy, V. 1997 Sexual differences in habitat use by *Rattus lutreolus*: the emergence of patterns in native rodent community structure. Aust.Mamm. 20: 43-48

Fox, B.J., M.D.Fox and E.Archer 1985 Experimental; confirmation of competition between two dominant species of *Iridomyrmex* Aust.J.Ecol. 10: 105-110

CONTACT NAMES: Marilyn Fox and Barry Fox, Uni NSW

SITE 2

LOCALITY: "Wallaby Creek", near Urbenville, Woodenbong. Wallaby Knob at 9341-II-S Koreelah 463485; 152 27'E 28 29'S

LAND USE: Part Beaury SF and private land

RESEARCH: Originally surveyed by Calaby (1966). Macropod studies since 1974.

TEACHING: Used for numerous thesis studies, possibly undergraduate

REFERENCES: Jarman, P.J., C.N.Johnson, C.J.Southwell and R.Stuart-Dick 1987 Macropod Studies at Wallaby Creek I. The area and animals Aust.Wildl.Res. 14: 1-14

Macropod Studies at Wallaby Creek now up to at least IX)

CONTACT NAMES: Peter Jarman

SITE 3

LOCALITY: Mumbulla SF, northeast of Bega 149 56'E 36 34'S
LAND USE: State Forest
RESEARCH: Lizard dietary studies from 1980 to 1984, influences of logging, fire and drought on fauna
TEACHING: Not known
REFERENCES: Lunney, D., E.Ashby, J.Grigg and M.O'Connell 1989 Diets of scincid lizards *Lampropholis guichenoti* and *L. delicata* in Mumbulla State Forest on the South Coast of NSW Aust.Wildl.Res. 16:307-312
Lunney, D., J.Barker and T.Leary 1988 Movements of banded bats in Mumbulla State Forest near Bega, NSW Aust Mamm. 11: 165-169
Lunney, D., P.Eby and M.O'Connell 1991 Effects of logging, fire and drought on three species of lizards in Mumbulla State Forest on the south coast of NSW Aust.J.Ecol. 16: 33-46
Lunney, D.,M.O'Connell, J.Sanders and S.Forbes 1898 Habitat of the White-footed Dunnart, *Sminthopsis leucopus*, in a logged, burnt forest near Bega, NSW Aust.J.Ecol. 14: 335-344
CONTACT NAMES: Dan Lunney

SITES 4a,4b

LOCALITY: Nelson Bay (32 47'S/152 05'E) and Smiths Lake (32 24'S/152 24'E), 7km SW of Nelson Bay
LAND USE: Private (sand mining)
RESEARCH: Long-term study of small mammals (1972-1977)
TEACHING: PhD thesis
REFERENCES: Kemper, C.M. 1990 Small mammals and habitat disturbance in open forest of coastal NSW I. Population parameters Aust.Wildl.Res. 17:195-206
C.Kemper 1981 Description of *Pseudomys novaehollandiae* burrows with radioisotopes Aust.Mamm. 4: 141-144
CONTACT NAMES: Cathy Kemper?

SITE 5

LOCALITY: Matcham, a suburb of Gosford (33 24'8"S/151 26'25"E)
LAND USE: Private?
RESEARCH: Movements and diet of Grey-headed Flying Foxes at a colony site between 1986 and 1990.
TEACHING: Not known
REFERENCES: Parry-Jones, K.A. and M.L.Augee 1991 Food selection by Grey-headed Flying Foxes (*Pteropus poliocephalus*) occupying a summer colony site near Gosford, NSW Wildl.Res. 18: 111-124
Parry-Jones, K.A. and M.L.Augee 1992 Movements of Grey-headed Flying Foxes (*Pteropus poliocephalus*) to and from a colony site on the Central Coast of NSW Wildl.Res. 19: 331-340
CONTACT NAMES: Mike Augee

SITE 6

LOCALITY: Nimmitabel (36 46'S/149 22'E)
LAND USE: State Forest
RESEARCH: Ecology of Flame and Scarlet Robins
TEACHING: Not known – PhD thesis Monash Uni
REFERENCES: Robinson, D. 1992 Habitat use and foraging behaviour of the Scarlet Robin and the Flame Robin at a site of breeding-season sympatry. Wildl.Res. 19:377-395
Robinson, D. 1993 Interspecific aggressive behaviour between robins and other birds in eucalypt forest. Corella 17: 107-110
Robinson, D. 1992 Why do Flame Robins migrate? A comparison between the social and feeding ecologies of the Flame Robin and the Scarlet Robin. Corella 16: 1-14
CONTACT NAMES: ?

SITE 7

LOCALITY: Waratah Creek Flora Reserve, Coolangubra SF, near Bombala.

37 01'S/149 23'E. Size 5000ha

LAND USE: State Forest

RESEARCH: Long term studies of arboreal marsupials, surveyed from 1981 to 1992, 1983 experimental logging/fire. Continued to be surveyed. 'Study initiated to examine the effects of timber harvesting on wildlife and vegetation, various logging treatments applied with differing levels of retained overwood' FWPRDC, 1998

TEACHING: ?

REFERENCES: Goldingay, R.L. and R.P.Kavanagh 1995 Foraging behaviour and habitat use of the Feathertail Glider (*Acrobates pygmaeus*) at Waratah Creek, NSW Wildl.Res. 22: 457-470

Kavanagh, R.P. and M.J.Lambert 1990 Food selection by the Greater Glider, *Petauroides volans*: is foliar nitrogen a determinant of habitat quality? Aust.Wildl.Res. 17: 285-299

Goldingay, R.L. and R.P.Kavanagh 1988 detectability of the Feathertail Glider, *Acrobates pygmaeus*, in relation to measured weather variables. Aust.Mamm. 11: 67-70

Goldingay, R.L 1986 Feeding behaviour of the Yellow-bellied Glider, *Petaurus australis*, at Bombala, NSW Aust.Mamm. 9: 17-25

Goldingay, R.L. and R.P.Kavanagh 1991 The Yellow-bellied Glider: a review of its ecology, and management considerations in "Conservation of Australia's Forest Fauna" D.Lunney (ed) Royal Zoological Society of NSW Mosman

Kavanagh, R.P. 1984 Seasonal changes in habitat use by gliders and possums in Southeastern NSW in "possums and Gliders" A.P.Smith and I.D.Hume (eds) Australian Mammal Society, Sydney

Kavanagh, R.P. 1988 The impact of predation by the powerful owl, *Ninox strenua*, on a population of the greater glider, *Petauroides volans*. Aust.J.Ecol. 13: 445-450

CONTACT NAMES: Rod Kavanagh

SITES 8a onwards

LOCALITY: 21 sites in northern NSW between Grafton and Taree (Lat/longs in Catling and Burt, 1997)

LAND USE: State Forest, NP and private

RESEARCH: Studies of faunal use in forests (1987-1994), each site sampled once or twice.

TEACHING:-

REFERENCES: Catling, P.C. and R.J.Burt 1997 Studies of the ground-dwelling mammals of eucalypt forests in North-eastern NSW: the species, their abundance and distribution Wildl.Res. 24: 1-19

CONTACT NAMES: Peter Catling

SITE 10

LOCALITY: Olney State Forests, south-west of Newcastle (Olney SF HQ 151 20'E/33 05'S)

LAND USE: State Forest

RESEARCH: Fauna use in eucalypt plantation forests, 'examine canopy dynamics of healthy and unhealthy trees in relation to insect herbivory' (1993+, Lemon Tree Road) FWPRDC, 1998. Used as a study site by Royal Zoological Society of NSW (Ray Williams). Wollombi Brook, Long-term monitoring (since 1976) of the frog community; research into local disappearance of *Mixophyes iteratus* (M.Mahony); Ridge 46, long-term (1980-1990) banding study of a range of microchiropteran bats species based upon harp trap captures (G.Hoye)

TEACHING: Use by NSW Field Ornithologists and Cumberland Bird Observers Club and Uni Sydney teaching site (biological science) since 1989 ("The Basin"). Used by University of Newcastle for 2nd year biology and environmental science teaching

REFERENCES: Kavanagh, R.P. and R.J.Turner 1994 Birds in eucalypt plantations: the likely role of retained habitat trees. Aust.Birds 28:32-40

M.Mahony 1993 The status of frogs in the Watagan Mountains area of the Central Coast of NSW. Trans.Roy Zool. Soc. NSW

CONTACT NAMES: Rod Kavanagh/Michael Mahony/Glenn Hoye

SITE 11

LOCALITY: Mulligans Flat Nature Park, 149 09'E/33 05'S

LAND USE: Recreation (ACT Parks & Recreation)

RESEARCH: Long term study of bird use of eucalypt forest. 20 sites in Park, surveyed every 3 months, now for 3 years by Canberra Ornithologists Club

TEACHING: ?

REFERENCES: Not published

CONTACT NAMES: Paul Fennell

SITE 12

LOCALITY: Between Bundarra (30 10'S/151 04'E) and Kingstown (30 30'S/151 06'E), west of Armidale (30 20'S/151 05'E)

LAND USE: Private

RESEARCH: Long-term studies of the Regent Honeyeater, numerous sites

TEACHING: ?

REFERENCES: Ley, A.J. and M.B.Williams 1992 The conservation status of the Regent Honeyeater near Armidale, NSW Aust Bird Watcher 14: 277-281

Ley, A.J. and M.B.Williams 1994 Breeding behaviour and morphology of the Regent Honeyeater, *Xanthomyza phrygia*. Aust Bird Watcher 15: 366-376

Ley, A.J. 1990 Notes on the Regent Honeyeater, *Xanthomyza phrygia* Aust Bird Watcher 13: 171-173

CONTACT NAMES: Andrew Ley

SITE 13.

LOCALITY: Mt Mugga, ACT (about 35 26'S/149 07'E)

LAND USE: Private/Crown

RESEARCH: 4 year study of bird use

TEACHING: ?

REFERENCES: Olsen, P., D.Mallinson and J.Olsen 1991 The bird community of Mt Mugga, A.C.T.: June 1982 to January 1986 Aust Bird Watcher 14: 13-23

CONTACT NAMES: Possibly Paul Fennell (COC)

SITE 14

LOCALITY: New Chums Road in the Brindabella Range, A.C.T. (32 24'S/148 50'E)

LAND USE: Crown?

RESEARCH: Considered "one of the longest-running, continuous banding studies by amateur ornithologists in the southern hemisphere" 19 year Bird banding study (1961-1979) with 35,000 banding records, Still going in 1982 i.e. 21 years

TEACHING: ?

REFERENCES: Tidemann, S.C., S.J.Wilson and T.G.Marples 1988 Some results from a long-term bird-banding project in the Brindabella Range, ACT Corella 12:1-6

Horey, G.M. and S.J.Wilson 1971 A banding project in the Brindabella Ranges, ACT Aust Bird bander 9: 27-33

Lamm, D.W. and S.J.Wilson 1966 Seasonal fluctuations of birds in the Brindabella Range, ACT Emu 65:183-207

Stokes, A. 1975 The effect of a bush fire on the banding of Flame Robins in the Brindabella Ranges Aust Bird Bander 13: 75-76

Wilson, S.J. 1994 Sedentariness and survival of White-browed Scrub-wrens in the Brindabella Range, ACT Corella 18: 65-70

Wilson, S.J. 1995 Survival of Brown and Striated Thornbills in the Brindabella Range, ACT Corella 19:138-146 (has good map of sites)

Baker, G.B., E.B.Dettmann and S.J.Wilson 1997 Fire and its impact on avian population dynamics
 Pacific Conservation Biology 3: 206-212
 CONTACT NAMES: Aust Bird-banding Scheme

SITE 20

LOCALITY: Eastwood State Forest, 10km SE Armidale 30 35'S/151 41'E
 LAND USE: State Forest (240ha)
 RESEARCH: Long-term bird studies in eucalypt forest (1979-1998). Research on bird communities including losses of species due to habitat fragmentation and degradation, foraging behaviour, breeding biology and population dynamics, especially on Superb Fairy-wren, Rufous Whistler, Fuscous Honeyeater, Red Wattlebird, Noisy Friarbird. Defoliating insects and tree growth
 TEACHING: Undergraduate teaching, postgraduate research projects (Uni. New England)
 REFERENCES: Ford, H.A. and S.Debus 1994 Aggressive behaviour of Red Wattlebirds *Anthochaera carunculata* and Noisy Friarbirds *Philemon corniculatus* Corella 15: 141-147
 Ford, H.A., L.Bridges and S.Noske 1985 Density of birds in eucalypt woodland near Armidale, north-eastern NSW Corella 9: 97-107
 Bell, H.L. and H.A.Ford 1987 Fidelity to breeding-site in four species near Armidale, NSW Corella 11: 1-5
 Brigham, R.M. and F.Geiser 1997 Breeding biology of Australian Owlet-nightjars *Aegotheles cristatus* in eucalypt woodland Emu 97: 316-321
 Nias, R.C. and H.A.Ford 1992 The influence of group size and habitat on reproductive success in the Superb Fairy-wren *Malurus cyaneus* Emu 92: 238-243
 Lowman, M.D. and H.Heatwole 1987 The impact of defoliating insects on the growth of eucalypt saplings. Aust.J.Ecol. 12: 175-181
 Bridges, L. 1994 Breeding biology of a migratory population of the Rufous Whistler *pachycephala rufiventris* Emu 94: 106-115
 Bridges, L. 1994 Territory and male fidelity in a migratory population of the Rufous Whistler *pachycephala rufiventris* Emu 94: 156-165
 Ford, H.A., G.Barrett and H.Recher 1996 Birds in a degraded landscape-safety nets for capturing regional diversity. In D.Saunders, J.Craig and L.Mattiske (eds) "Nature Conservation 4: The Role of Networks" Surrey Beatty & Sons, Sydney
 Ford, H.A. 1990 Relationships between distribution, abundance and foraging niche breadth in Australian land-birds. Ornis Scandinavica 21: 133-138
 Ford, H.A. and H.L.Bell 1981 Density of birds in eucalypt woodland affected to varying degrees by dieback. Emu 81: 202-208
 Ford, H.A., S.Noske and L.Bridges 1986 Foraging of birds in eucalypt woodland in northeastern NSW Emu 86: 168-179
 Ford, H.A., L.Bridges and S.Noske 1990 Inter-observer differences in recording of foraging behaviour of Fuscous Honeyeaters. Studies in Avian Biology 13: 199-201
 Ford, H.A., L.Huddy and H.Bell 1990 Seasonal changes in foraging behaviour of three passerines in Australian eucalyptus woodland Studies in Avian Biology 13: 245-253
 Ligon, J.D., S.H.Ligon and H.A.Ford 1991 An experimental study of the bases of male philopatry in the cooperatively breeding Superb Fairy-wren Ethology 87: 134-148
 Barrett, G., H.A.Ford and H.Recher 1994 Conservation of woodland birds in a fragmented rural landscape Pacific Conservation Biology 1: 245-256
 CONTACT NAMES: Hugh Ford/State Forests of NSW

SITE 21

LOCALITY: New England NP 30 30'S/152 30'E (three sites used by McFarland – Uphill site [0.5km W of Wright's LO]; Wright's Lookout site; Lyrebird site [~2km N of LO])
 LAND USE: National Park
 RESEARCH: Long-term bird banding sites (1977-1986), population biology of Eastern Spinebill
 TEACHING: ?
 REFERENCES: McFarland, D.C. and H.A.Ford 1987 Aspects of population biology of the eastern Spinebill *Acanthorhynchus tenuirostris* in New England National Park, NSW Corella 11: 52-58

McFarland, D.C. 1984 Seasonal changes in the avifauna of New England national Park. *Aust Bird Watcher* 10: 255-263

Ford, H.A. and J.F.Pursey 1982 Status and feeding of the Eastern Spinebill *Acanthorhynchus tenuirostris* at New England National Park, NSW *Emu* 82: 203-211

McFarland, D.C. 1986 Seasonal changes in the abundance and body condition of honeyeaters in response to inflorescence and nectar availability in New England National Park, NSW *Aust.J.Ecol.* 11: 331-340

McFarland, D.C. 1986 The organisation of a honeyeater community in an unpredictable environment. *Aust.J.Ecol.* 11: 107-120

CONTACT NAMES: Hugh Ford

SITE 22

LOCALITY: Near Bombala (36 54'S/149 14'E)

LAND USE: Private

RESEARCH: Bird census in woodlots near Bondi SF between 1976 and 1981, invertebrate studies

TEACHING: ?

REFERENCES: Shields, J.M. and H.R.Recher 1984 Breeding bird censuses: an evaluation of four methods for use in sclerophyll forest. *Corella* 8: 29-41

Recher, H.F. and R.T.Holmes Foraging ecology and seasonal patterns of abundance in a forest avifauna. In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

Recher, H.F., R.T.Holmes, M.Schultz, J.Shields and R.Kavanagh 1985 Foraging patterns of breeding birds in eucalypt forest and woodland in southeastern Australia *Aust.J.Ecol.* 10: 399-419

Gowing, G. and H.F.Recher 1984 Length-weight relationships for invertebrates from forests in south-eastern NSW *Aust.J.Ecol.* 9: 5-8

CONTACT NAMES: Jim Shields

SITE 23

LOCALITY: Wollomombi Falls Reserve, 42km east of Armidale (30 32'S/152 02'E)

LAND USE: Recreation

RESEARCH: Long-term studies of fauna – birds (6 years) and arthropods (3 years)

TEACHING: Possible

REFERENCES: Noske, R.A. 1979 Co-existence of three species of treecreepers in north-eastern NSW. *Emu* 79: 120-128

Bell, H.L. 1985 Seasonal variation and the effects of drought on the abundance of arthropods in savanna woodland on the Northern Tablelands of NSW. *Aust.J.Ecol.* 10: 207-221

Noske, R.A. 1991 A demographic comparison of cooperatively breeding and non-cooperative treecreepers (Climacteridae) *Emu* 91: 73-86

Bell, H.L. 1985 The social organization and foraging behaviour of three syntopic thornbills *Acanthiza* ssp. In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

Noske, R.A. 1985 Habitat use by three bark-foragers of eucalypt forests. In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

Noske, R.A. 1986 Intersexual niche segregation among three bark-foraging birds of eucalypt forests. *Aust.J.Ecol.* 11: 255-267

CONTACT NAMES: Richard Noske?

SITE 26

LOCALITY: Nadgee State Forest, near Eden (37 19'S/149 48'E)

LAND USE: State Forest

RESEARCH: Long-term fauna studies

TEACHING:

REFERENCES: Kavanagh, R. 1987 Foraging behaviour of the Yellow-bellied Glider *Petaurus australis*, near Eden, NSW *Aust.Mamm.* 10: 37-39

Braithwaite, L.W. 1983 Studies on the arboreal marsupial fauna of eucalypt forests being harvested for woodchip at Eden, NSW I. The species and distribution of animals. *Aust Wildl.Res.* 10: 219-229
CONTACT NAMES: Rod Kavanagh

SITE 27

LOCALITY: Yambulla State Forest, 29km SW of Eden (37 18'S/149 40'E)
LAND USE: State Forest
RESEARCH: Eden Burning Study Area, long-term studies of flora and fauna response to fires in eucalypt forests. 'To determine the effects over time of timber harvesting and related reduction burning on vegetation structure and floristics, fuel characteristics and some faunal groups in DSF', FWPRDC, 1998. Experiment established between 1985 and 1988, burnt at 2 and 4 year intervals, re-measurement program is continuous. Measuring overstorey and understorey structure and composition, ground mammals and diurnal birds.
TEACHING: ?
REFERENCES: Claridge, A.W., A.McNee, M.T.Tanton and S.M.Davey 1991 Ecology of bandicoots in undisturbed forest adjacent to recently felled logging coupes: a case study from the Eden Woodchip Agreement Area. In *Conservation of Australia's Forest Fauna*. D.Lunney (ed) Royal Zoological Society of NSW, Mosman
Binns, D.L. and R.G.Bridges 1997 Ecological impacts and sustainability of timber harvesting and burning in coastal forests of Eden area: establishment and progress of the Eden Burning Study. Unpublished internal report SFNSW, Forest Research Division
Braithwaite, L.W., M.Clayton, L.McLean and B.S.Parker 1984 Vertebrate fauna of a 144-ha water catchment within eucalypt forest being harvested for woodpulp at Eden, South-eastern NSW. CSIRO Div.Wildl.and Rangelands Res. Tech.Paper No.35
CONTACT NAMES: Rod Kavanagh

SITE 28

LOCALITY: Nadgee Nature Reserve, 37 27'S/149 54'S
LAND USE: Nature Reserve
RESEARCH: Long-term fauna studies, including recovery from fire (6 years in 1983)
TEACHING:
REFERENCES: Catling, P. 1986 *Rattus lutreolus*, colonizer of heathland after fire in the absence of *Pseudomys* species? *Aust.Wildl.Res.* 13: 127-139
Catling, P.C. and A.E.Newsome 1981 Mammal communities of heath and their management and conservation approach. In "Heaths in New South Wales" Parks Wildl, July 1981
Catling, P.C., A.E.Newsome and G.Dudzinski 1982 Small mammals, habitat components, and fire in south-eastern Australia. *Proc Symp. Dynamics Manage. Mediterranean-type Ecosystems*, June, 1981 San Diego, California
Newsome, A.E., J.C.McIroy and P.C.Catling 1975 The effects of an extensive wildfire on populations of twenty ground vertebrates in south-east Australia. *Proc.Ecol.Soc.Aust.* 9: 107-123
Newsome, A.E., McIlroy, J., and Catling, P. (1975). The Effects of an Extensive Wildfire on Populations of Twenty Ground Vertebrates in South-East Australia. *Proceedings of the Ecological Society of Australia* **9**, 107-123.
Newsome, A.E., Catling, P.C. and Corbett, L.K. (1983). The Feeding Ecology of the Dingo. II. Dietary and Numerical Relationships with Fluctuating Prey Populations in S.E. *Australian Journal of Ecology*, **8**(4): 345-366.
Catling, P.C. (1984). Fire and Fauna. *Australian Science Magazine* **4**: 43-46.
Catling, P.C. (1986). *Rattus lutreolus*, the Colonizer of Heathland after Fire in the absence of *Pseudomys* species? *Australian Wildlife Research* **13**: 127-139.
Phillips, M., and Catling, P.C. (1991). Home Range and Activity Patterns of Red Foxes in Nadgee Nature Reserve. *Wildlife Research*, **18** (5), 677-86.
Baird, I., Catling, P.C., and Ive, J.R. (1994). Prescribed burning for wildlife management at Nadgee Nature Reserve, Australia. *International Journal of Wildland Fire* **4**(2), 107-21.
Catling, P.C. (1994). Bushfires and Prescribed Burning - Protecting Native Fauna. *Search* **25** (2), 37-40.

- Newsome, A.E. and Catling, P.C. (1979). Habitat preferences of vertebrates inhabiting heathlands of coastal, montane and alpine regions of south-east Australia. In: "Ecosystems of the World. Heathlands and Related Shrublands". Ed.: R.L. Specht. pp.301-316.
- Catling, P.C. and Newsome, A.E. (1981). Responses of the Australian Vertebrate Fauna to Fire: An Evolutionary Approach. In: "Fire and the Australian Biota." (Eds. R.H. Groves, I.R. Noble and A.M. Gill). Australian Academy of Science, Canberra. pp. 273-310.
- Catling, P.C., Newsome, A.E. and Dudzinski, M.L. (1982). Small mammals, Habitat Components & Fire in South-eastern Australia. Proceedings of Symposium on Dynamics & Management of Mediterranean-type Ecosystems: An International Symposium. June 1981. San Diego, California. pp.199-206.
- Newsome, A.E. and Catling, P.C. (1983). Animal Demography in Relation to Fire and Shortage of Food. Some Indicative Models. In: Mediterranean Type Ecosystems. The Role of Nutrients. (Eds. F.J. Kruger, D.T. Mitchell and J.U.M. Jarvis). Springer-Verlag (Ecological Studies). pp.490-508.
- Catling, P.C. (1988). Vertebrates. Chapt. IV In: Tasks for Vegetation Science 17 Mediterranean-type ecosystems : A Data Source Book. (Ed. R.L. Specht). Dr. W. Junk, Publishers. pp.171-196.
- Catling, P.C. (1991). Ecological effects of prescribed burning practices on the mammals of southeastern Australia. Chapter 30. In: "Conservation of Australia's Forest Fauna" (Ed.D.Lunney). Royal Zoological Society of NSW, Mosman. 353-363.
- Catling, P.C. (1978). Dingo movements in southeastern New South Wales. Proceedings Australian Vertebrate Pest Control Conference, Canberra. July 1978. pp. 40 -42.
- Newsome, A.E., Catling, P.C. and Corbett, L.K. (1983). The feeding ecology of dingoes in South Eastern Australia. Proceedings Australian Vertebrate Pest Control Conference, Dubbo. June 1983. pp. 38-42.
- Catling, P.C. (1984). The Extinction and Recolonization of Heathland by Small Mammals after Fire - a Strategy of Resilience. (Ed. B. Dell). Proceedings of the Fourth International Conference on Mediterranean Ecosystems, Perth Australia. pp. 27-28.
- Catling, P.C., Cowan, P.E. and Green, B. (1988). The Effects of fire and season on the water and energy turnover of small mammals in S.E. Australia. "Time Scales and Water Stress". Proceedings Vth International Conference on Mediterranean - Climate Ecosystems. Montpellier, France. pp. 655-660.
- Catling, P.C., and Phillips, M. (1991). Home Range, Activity Patterns and Mortality of Cubs in Red Foxes in Southeastern Australia. Proceedings of the Australian Vertebrate Pest Control Conference, Adelaide, 172-6.
- Sugden, E.A. and G.H.Pyke 1991 Effects of honey bees on colonies of *Exoneura asimillima*, an Australian native bee. Aust.J.Ecol. 16: 171-181
- Posamentier, H.G., S.S.Clark, D.L.Hain and H.F.Recher 1981 Succession following wildfire in coastal heathland (Nadgee Nature Reserve, NSW). Aust.J.Ecol. 6: 165-175
- CONTACT NAMES: Peter Catling

SITE 29

LOCALITY: Five Day Creek, near Armidale (30 36'S/152 22'E)

LAND USE: Private

RESEARCH: Long-term bird studies (3 years at 1985)

TEACHING: ?

REFERENCES: Cameron, E. 1985 Habitat usage and foraging behaviour of three fantails (*Rhipidura*: Pachycephalidae) In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

CONTACT NAMES: Elizabeth Cameron

SITE 30

LOCALITY: Moruya, 5km NW of Moruya (35 53'S/150 03'E)

LAND USE: Private

RESEARCH: Long-term bird studies in woodland and forest (1975-1998)

TEACHING: -

REFERENCES: Marchant, S. 1985 Breeding of the Eastern Yellow Robin *Eopsaltria australis* In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

Marchant, S. 1982 The sedentary nature of passerine birds at Moruya, NSW Corella 6: 87-88

Marchant, S. 1981 The breeding season at Moruya, NSW Corella 5: 19-25

Marchant, S. 1991 behaviour of White-winged Choughs *Corcorax melanorhamphos* Nature in Eurobodalla 6: 56-58

CONTACT NAMES: S.Marchant

SITE 31

LOCALITY: East Boyd State Forest, bounded by Banksia Road and Imlay Road, Eden district 37 15'S/149 50'E

LAND USE: State Forest

RESEARCH: Long-term studies of the effects of logging forest upon fauna (1976-1998). Logged 1976, sampled 1,2,3,4,13,22 years, flora and fauna (birds, reptiles)

TEACHING: ?

REFERENCES: Kavanagh, R.P., J.M.Shields, H.F.Recher and W.G.Rohan-Jones 1985 Bird populations of a logged and unlogged forest mosaic at Eden, NSW In "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation and Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU/Surrey Beatty & Sons

CONTACT NAMES: Rod Kavanagh

SITE 32

LOCALITY: Bulls Ground, south of Wauchope 31 36'S/152 44'E

LAND USE: Lorne State Forest

RESEARCH: Bulls Ground Frequent Burning Study Area (20ha). Examining the effects of prescribed burning on even-aged blackbutt regrowth on fuel and overstorey dynamics (1970+), vegetation dynamics, and litter invertebrates. Studied since 1969, with re-measurements almost continuous until 1992, with 1996 vegetation re-sampling

TEACHING: -

REFERENCES: van Loon, A.P. 1969 Investigations into the effects of prescribed burning on young, even-aged Blackbutt. Forestry Commission of NSW Research Note No.23

Van Loon, A.P. 1970 Investigations into the effects of prescribed burning on young, even-aged Blackbutt. First Interim Progress Report: September, 1970 Forestry Commission of NSW

York, A. 1996 Long-term effects of repeated prescribed burning on forest invertebrates: management implications for the conservation of biodiversity. Consultancy Report to the Department of Environment Sport and Territories Forest Ecology Section Research Section, State Forests of NSW

York, A. 1997 Long-term effects of repeated fuel-reduction burning: Preliminary results from the F8/2.9 frequent burning study, Bulls Ground State Forest. Report prepared for State Forests of NSW Central Region, Symbiosis Pty Ltd

CONTACT NAMES: Doug Binns

SITE 33

LOCALITY: Bago-Marangle, south of Tumut, 35 45'S/148 15'E

LAND USE: Bago and Marangle State Forests

RESEARCH: Bago-Marangle Ecologically Sustainable Case Study Assessment of sustainability of soil, water, wildlife and vegetation. Established in 1995 and continuous monitoring since. Arboreal marsupials and birds (Kavanagh), ground mammals (Stanton), frogs (Lemckert) and bats (Law). Surveyed for fauna in 1981 by Bruce Gall (NSWNPWS)

TEACHING: -

REFERENCES: SFNSW reports

Kavanagh, R.P. and M.A.Stanton 1998 Nocturnal forest birds and arboreal marsupials of the southwestern slopes, NSW Australian Zoologist 30: 449-466
 Law, B., J.Anderson and M.Chidel 1998 A bat survey in State Forests on the south-west slopes region of NSW with suggestions of improvements for future surveys. Aust.Zool. 30: 467-479
 Stanton, M.A. and J.A.Anderson 1998 A survey of ground-dwelling mammals inhabiting forests on the southwestern slopes, NSW Aust Zool. 30: 480-491
 Lemckert, F. 1998 A survey for threatened herpetofauna of the south-west slopes of NSW Aust.Zool. 30: 492-500
 CONTACT NAMES: Rod Kavanagh

SITE 34

LOCALITY: Lorne Flora Reserve, 10km W Herons Creek and Middle Brother State Forest (31 37'S/152 35'E)
 LAND USE: Lorne and Middle Brother State Forests
 RESEARCH: Kendall-Cooperook Ecologically Sustainable Case Study, established 1995 to monitor effects of forestry. Monitoring bats, but expected to survey other fauna in future. Part of the 'Camden Haven Study' in the late 1970's.
 TEACHING: -
 REFERENCES: Internal SFNSW reports at present
 Milledge, D. 1979 'The Camden haven Wildlife Refuge Study – Final report' The Australian Museum, Sydney
 CONTACT NAMES: Rod Kavanagh

SITE 35

LOCALITY: Germans Creek, Yambulla State Forest, 50km SW of Eden 37 21'S/149 39'E
 LAND USE: State Forest
 RESEARCH: Yambulla Catchments Forest Hydrology Research Project. Examining the effects of intensive forest harvesting (and wildfire) on streamflow, water quality and vegetation. Established 1977 and on-going to 1998.
 TEACHING: -
 REFERENCES: Binns, D. 1984 Summary of vegetation studies in 'Eden Catchment Project 1984 Review' For.Comm.Misc.Pap.No 964
 Cornish, P.M. and Binns, D. 1987 Streamwater quality following logging and wildfire in a dry sclerophyll forest in south-eastern Australia. For.Ecol. & Manage. 22: 1-28
 Harper, P.B. and S.T.Lacey 1997 A review of findings from the Yambulla Catchments Forest Hydrology Research Project 1977-1990 Report by Forest and Research and Development Division, SFNSW
 CONTACT NAMES: Peter Cornish

SITE 36

LOCALITY: Tributaries of Telegherry River, west of Dungog (282ha) 32 24'S/151 45'E
 LAND USE: State Forest
 RESEARCH: Karuah Hydrology Catchment Project Quantitative data on the effects of various forest practices on water quality, vegetation, and invertebrates since 1974
 TEACHING: Used for studies by University of Sydney, teaching site (biological science) since 1989. Several theses.
 REFERENCES: Various internal SFNSW reports
 Cornish, P.M. 1993 Effects of logging and forest regeneration on water yields in a moist eucalypt forest in NSW J.Hydrol. 150:301-322
 CONTACT NAMES: Peter Cornish, Doug Binns

SITE 37

LOCALITY: Glenbog State Forest, 12 SW of Bemboka 36 38'S/149 35'E
 LAND USE: State Forest, now National Park (Tantawanglo)

RESEARCH: Tantawanglo Research Catchments established 1984 to monitor water flow and quality and vegetation following logging and burning. Permanent vegetation plots. Vegetation sampled in 1988, and possibly on-going

TEACHING: -

REFERENCES: Internal SFNSW reports

CONTACT NAMES: ?

SITE 38

LOCALITY: Red Hill, 23 km north of Tumut 35 10'S/148 22'E

LAND USE: Buccleuch State Forest

RESEARCH: Water quality impacts of establishing pine plantations on ex-pasture, established in 1988.

TEACHING: -

REFERENCES: Internal SFNSW reports

CONTACT NAMES: ?

SITE 39

LOCALITY: Mount Boss, 80km W Port Macquarie 31 15'S/152 20'E

LAND USE: Mt Boss State Forest

RESEARCH: Long-term bird studies (1980-1982, and possibly later)

TEACHING: -

REFERENCES: Shields, J.M., R.P. Kavanagh and W.G.Rohan-Jones 1985 Forest avifauna of the Upper Hastings River in 'Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management' A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU and Surrey Beatty & Sons, Sydney

CONTACT NAMES: Jim Shields

SITES 43a,b,c

LOCALITY: Chaelundi SF(30 03'S/152 21'E), London Bridge SF(29 50'S/152 15'E), Styx River SF (30 32'S/152 17'E), Northern Tablelands

LAND USE: State Forest

RESEARCH: Distribution of large forest owls in northern NSW, three "long-term" study sites (1991-1992)

TEACHING: -

REFERENCES: Debus, S.J.S. 1995 Surveys of large forest owls in northern NSW: methodology, calling behaviour and owl responses

CONTACT NAMES: Steven Debus

SITE 44

LOCALITY: Pappinbarra Field Studies Centre, 45km NW of Wauchope 31 23'S/152 30'E

LAND USE: Mount Boss State Forest

RESEARCH: Long-term cooperative bird-banding site (at least 1985 onwards). Studies on Brown Pigeon, Azure Kingfisher, Noisy Pitta, Black-faced Monarch, Rose Robin, Regent Bowerbird

TEACHING: Mainly school groups

REFERENCES: None known

CONTACT NAMES: Port Macquarie High School

SITE 45

LOCALITY: Bobo River Banding Station,

LAND USE: Wild Cattle Creek State Forest. Listed as "Indicative Place" on Register

RESEARCH: "To collect morphometric data to facilitate ageing and sexing of Pale-yellow Robins; to study movement patterns of this species and its interactions with the Eastern Yellow robin; to study the community structure of species of the Bobo River, north coast of NSW" Flightlines 21 Jan 1998. Also a site for macropod studies

TEACHING: Site for several theses studies (Univeristy of new England)
REFERENCES: Floyd, R.B. 1980 Density of *Wallabia bicolor* in eucalypt plantations of different ages. Aust.Wildl.Res. 7: 333-337
Johnson, K.A. 1980 Spatial and temporal use of habitat by the Red-necked Pademelon, *Thylogale thetis* Aust.Wildl. Res. 7: 157-166
CONTACT NAMES: David Page

SITE 46

LOCALITY: Coutts Crossing, south of Grafton 29 50'S/152 53'E
LAND USE: Private
RESEARCH: Long-term bird studies of remnant bushland (1985-1998)
TEACHING: -
REFERENCES: Not known
CONTACT NAMES: Greg Clancy

SITE 47

LOCALITY: Clouds Creek Banding Station, 30 05'S/152 38'E
LAND USE: State Forest?
RESEARCH: Long-term bird-banding studies (ABBBS). "To study the demography (including abundance, survival and recruitment) and movement patterns of the species commonly occurring in regenerating sub-tropical rainforest at the junction of Cloud's Creek and Hortons Creek" (Flightlines 21, Jan, 1998). Site of habitat preference studies of small mammals in pine and native forests.
TEACHING: Clouds Creek Forest Station used by Uni. New England for teaching
REFERENCES: Barnett, J.L., R.A.How and W.F.Humpreys 1976 Mammals of Clouds Creek, North-eastern NSW, and their distribution in pine and native forests. Aust. Zool. 19: 23-34; Barnett, J.L., R.A.How and W.F.Humpreys 1978 The use of habitat components by small mammals in eastern Australia
CONTACT NAMES: David Page

SITE 48

LOCALITY: Iluka Nature Reserve, 29 24'S/153 21'E
LAND USE: Nature Reserve
RESEARCH: Long-term cooperative bird-banding station to study species in littoral rainforest; studies by NPWS on Koala movements and population dynamics; bush regeneration studies
TEACHING: Possibly
REFERENCES: Moon, C. and D.Lunney 1990 A survey of the Iluka Koala population NPWS Report
Moon, C. 1990 management strategy for the Iluka Koala population. Report to NSW Dept lands and NPWS
Urban Bushland Management Inc. 1993 A restoration strategy for the Iluka Peninsula Vols 1 and 2. Report to the Association of Iluka Residents
CONTACT NAMES: Greg Clancy

SITE 49

LOCALITY: Susan Island, Grafton 29 41'S/152 55'E
LAND USE: Nature Reserve (managed by Susan and Elizabeth Island Trust), Registered on National Estate (003421)
RESEARCH: Over 10 years bird-banding studies, and studies of flying fox colonies
TEACHING: Bird regeneration courses, NPWS seasonal rangers educational courses
REFERENCES: Not known
CONTACT NAMES: Greg Clancy

SITE 50

LOCALITY: ANU Field Station, Kiola State Forest, Edith and Joy London Foundation , near

Termeil (35 31'S/150 24'E)

LAND USE: State Forest

RESEARCH: Fauna studies since before 1983, arboreal surveys for past 3 years, study site for Ross Goldingay arboreal marsupials. Used as part of The Australian Pathfinder Project by Department of Geography, Australian National University (land cover change detection, global carbon cycle and biogeochemistry activities)

TEACHING: PhD studies, used by ANU and Uni Wollongong

REFERENCES: see www.ainet.com.au/pathfinder.html

CONTACT NAMES: Rob Whelan

SITE 51a, b,c

LOCALITY: Jervis Bay; Beecroft Peninsula (35 00'S/150 51'E) , Currumbene SF (34 58'S/150 36'E), Bherwerre Peninsula (35 10'S/150 38'E)

LAND USE: State Forest/national parks (State and Commonwealth)

RESEARCH: Studies of threatened orchid species (Illawarra Greenhood); conservation genetics (gene flow between populations of *Grevillea barkleyana*), honey-bees and pollination.

TEACHING: Used by Uni. of Wollongong for 4 years

REFERENCES: Harriss, F. & Whelan, R.J. (1993) Selective fruit abortion in *Grevillea barklyana* (Proteaceae). *Australian Journal of Botany*, **41**,499-509.

Ayre, D.J., Whelan, R.J. and Reid, A. (1994) Unexpectedly high levels of selfing in the Australian shrub *Grevillea barklyana* (Proteaceae) *Heredity* **72**, 168-174.

Edwards, W. and Whelan, R.J. (1995) The size, distribution and germination requirements of the soil-stored seed bank of *Grevillea barklyana* (Proteaceae) *Australian Journal of Ecology* **20**, 548-555.

Hogbin, P., Ayre, D.J. & Whelan, R.J. (1997) A genetic and demographic investigation of the conservation value of the threatened shrub *Grevillea barklyana* (Proteaceae). *Heredity* **79**, in

press.

Goldingay, R.L. & Whelan, R.J. (1997) Powerline easements: do they promote edge effects in eucalypt forest for small mammals? *Wildlife Research* **24**,737-744.

Whelan, R.J., de Jong, N., & von der Burg, S. (1998) Variation in bradyosporous and seedling recruitment without fire among populations of *Banksia serrata* (Proteaceae) *Aust. J. Ecol.* **23**, in press.

Baker, J.R., Goldingay, R.L. & Whelan, R.J. (1998) Powerline easements through forests: a case study of impacts on avifauna. *Pacific Cons. Biol.* in press

Whelan, R.J. and Ooi, M. (1991) Habitat Corridors in the Jervis Bay Area. *Report for Mitchell McCotter and Associates, Consultants.*

Whelan, R.J. (1989) When is a flower visitor a pollinator - or - can a honeybee pollinate *Grevillea*? *Science Education News* **38**, 50-55.

CONTACT NAMES: Rob Whelan

SITE 58

LOCALITY: Hat Head National Park (31 05'S/153 05'E)

LAND USE: National Park

RESEARCH: 6 years bird observations by Tony Saunders

TEACHING: -

REFERENCES: -

CONTACT NAMES: Tony Saunders

SITE 61

LOCALITY: Mungo Brush, Myall Lakes (32 35'S/152 15'E)

LAND USE: National Park

RESEARCH: 10 years bird observations by Tony Saunders, research by Marilyn Fox?

TEACHING: Community education (bird observers)

REFERENCES: ?

CONTACT NAMES: Tony Saunders

SITE 63

LOCALITY: Sea Acres Nature Reserve, Port Macquarie (31 27'S/152 55'E)

LAND USE: Nature Reserve

RESEARCH:

TEACHING: Field Studies Centre, community education

REFERENCES: -

CONTACT NAMES: ?

SITE 65

LOCALITY: Seven Mile Beach National Park (34 45'S/150 45'E)

LAND USE: National Park

RESEARCH: 4 years bird observation by Tony Saunders (1985-1987), mammal surveys (1994-95)

TEACHING: -

REFERENCES: Murphy, M.J. 1998 Mammal survey of Seven Mile Beach National Park and Comerong Island Nature Reserve on the south coast of NSW Aust.Zool. 30: 419-425

CONTACT NAMES: Tony Saunders

SITE 70

LOCALITY: Putty Road, Wollemi National Park (32 55 – 32 25'S/150 35'E)

LAND USE: National Park

RESEARCH: On-going bird observations along Putty Road (yearly, from 1975) by Cumberland Bird Observers Club

TEACHING: Community education (bird groups)

REFERENCES: -

CONTACT NAMES: Tony Saunders

SITE 71

LOCALITY: Newholme Field Laboratory, Tilbuster, 11km NNW Armidale (30 22'S/151 40'E)

LAND USE: Freehold, leasehold, Mt Duval State Forest

RESEARCH: Used by University of New England for teaching and research since 1973.

Research: natural resources management, particularly hydrology, soils, native pastures, native woody vegetation, wildlife, recreation, sheep production and deer research.

TEACHING: Recreation; Agriculture; Ecosystems Management; Aquatic Systems; Fauna;

REFERENCES: Extensive, see Fauna (37 publications); Fire (2 publications); Aquatic Systems (5 publications); Soils (15 publications); Vegetation (29 publications); Water Resources (5 publications)

Total bibliography from 1975, B.Nat Res Theses: 42; Grad Dip Nat Res Theses: 6; Honours: 17; Master and PhD theses: 17; Journal Articles: 13; Conference Papers: 14; Unpublished Reports: 30. See A directory of Natural Resources – Newholme Field Laboratory, University of New England

CONTACT NAMES: Nick Reid

SITE 72

LOCALITY: Lees Creek and Blundle Creek, Brindabella Range, ACT (35 21'S/148 51'E)

LAND USE: ?

RESEARCH: Site of several PhD and Masters theses, study site for Chris Dickman, Pat Wooley, Tony Stuart, Andrew Cockburn. Type locality for new marsupial species, *Antechinus agilis*.

TEACHING: Several theses from ANU

REFERENCES: Many, Dickman, C.R. 1986 An experimental study of competition between two species of dasyurid marsupials Ecological Monographs 56: 221-241 (describes site)

CONTACT NAMES: Chris Dickman

SITE 73

LOCALITY: Warrah Trig, Pearl Beach (33 33'S/151 18'E)

LAND USE: Brisbane Water National Park

RESEARCH: Bird studies, including honeyeaters, foraging ecology, flower biology. Researchers include Drs Graham Pyke, Doug Armstrong, Richard Major & Harry Recher

TEACHING: Used by Uni Sydney as teaching site (Warrah Field Station)

REFERENCES: Pyke, G.H. and N.M. Waser. The production of dilute nectars by honeyeater and hummingbird flowers. *Biotropica*: 13: 260-270 (1981). Pyke, G.H. Why honeyeaters perch and hummingbirds hover. *Anim. Behav.* 29: 861-867 (1981).

Pyke, G.H. Honeyeater foraging: A test of optimal foraging theory. *Anim. Behav.* 29: 878-888

(1981). Pyke, G.H. Effects of inflorescence height and number of flowers per inflorescence on fruit set in Waratahs (*Telopea speciosissima*). *Aust. J. Bot.* 29: 419-424 (1981).

Pyke, G.H. Fruit set in *Lambertia formosa* Sm. (Proteaceae). *Aust. J. Bot.* 30: 39-45 (1982).

Pyke, G.H. Relationship between time since the last fire and flowering in *Telopea speciosissima* and *Lambertia formosa*. *Aust. J. Bot.* 31: 293-6 (1983).

Pyke, G.H. Analysis of an instantaneous census method for heathland birds. *Aust. Wild. Res.* 10: 521-526 (1983).

Pyke, G.H. Seasonal patterns of abundance of honeyeaters and their food resources in heathland areas near Sydney. *Aust. J. Ecol.* 8: 217-233 (1983).

Recher, H.F. 1981 Nectar-feeding and its evolution among Australian vertebrates. In A. Keast (ed) *Ecological Biogeography*, W. Junk, Boston

Armstrong, D.P. 1991 Nectar depletion and its implications for honeyeaters in heathland near Sydney. *Aust. J. Ecol.* 16: 99-109

Pyke, G.H. and H.F. Recher 1986 Relationship between nectar production and seasonal patterns of density and nesting of resident honeyeaters in heathland near Sydney. *Aust. J. Ecol.* 11: 195-200

CONTACT NAMES: Graham Pyke

SITE 74a-i

LOCALITY: a Bellingen Island (30 27'S/152 54'E); b Bruxner Park (30 15'S/153 07'E); c Susan Island (29 41'S/152 55'E); d Booyong (28 45'S/153 27'E); e Boatharbour (28 19'S/153 21'E); f Ballina (28 52'S/153 34'E); g Billinudgel (28 30'S/153 32'E); h Terania Creek (28 40'S/153 17'E); i Kyogle (28 37'S/153 00'E)

LAND USE: various, mainly private

RESEARCH: Long-term monitoring of Flying-fox maternity sites in northern NSW (up to 9 years) by NPWS and others

TEACHING: Some sites used for teaching e.g. Susan island

REFERENCES: Lunney, D. and C. Moon 1997 Flying foxes and their camps in the remnant rainforests of north-east NSW. In J. Dargavel (ed) "Australia's Ever-Changing Forests III. Proc. 3rd National Conference on Australian Forest History. CRES, Canberra

CONTACT NAMES: Dan Lunney

SITE 75

LOCALITY: Boarding House Dam, Watagan Creek, Watagan SF (33 01'S/151 11'E)

LAND USE: State Forest

RESEARCH: Long-term monitoring (since 1976) of the frog community; research into local disappearance of *Mixophyes iteratus* (M. Mahony);

TEACHING: 2nd year biology and environmental science, Uni Newcastle

REFERENCES: M. Mahony 1993 The status of frogs in the Watagan Mountains area of the Central Coast of NSW. *Trans. Roy Zool. Soc. NSW*

CONTACT NAMES: M. Mahony

SITE 76

LOCALITY: Gap Creek Flora Reserve, Watagan SF (33 02'S/152 25'E)

LAND USE: State Forest

RESEARCH: Long-term monitoring (since 1976) of the frog community; research into local disappearance of *Mixophyes iteratus* (M. Mahony);

TEACHING: Used by University of Newcastle for 2nd year biology and environmental science teaching
REFERENCES: M.Mahony 1993 The status of frogs in the Watagan Mountains area of the Central Coast of NSW. Trans.Roy Zool. Soc. NSW
CONTACT NAMES: Michael Mahony

SITE 77

LOCALITY: Bucca Bucca Creek, Bruxner Park Flora Reserve, Orara East SF (30 08'S/153 01'E)
LAND USE: State Forest
RESEARCH: Long-term monitoring (since 1992) of the frog community, particularly *Mixophyes iteratus* (M.Mahony)
TEACHING: -
REFERENCES: Report to Environment Australia on the status of the great barred river frog, in research plan for the barred river frogs
CONTACT NAMES: Mike Mahony

SITE 78

LOCALITY: Desert Creek, Washpool SF (29 16'S/152 25'E)
LAND USE:
RESEARCH: Long-term monitoring (since 1992) of the frog community, particularly *Mixophyes iteratus* (M.Mahony)
TEACHING: -
REFERENCES: Report to Environment Australia on the status of the great barred river frog, in research plan for the barred river frogs
CONTACT NAMES: Mike Mahony

SITE 79

LOCALITY: Long Creek, Levers Plateau, Border Ranges NP (28 20'S/152 52'E)
LAND USE: National Park
RESEARCH: Long-term monitoring (since 1992) of the frog community, particularly *Mixophyes fleayi* (M.Mahony)
TEACHING: -
REFERENCES: Report to Environment Australia on the status of the great barred river frog, in research plan for the barred river frogs
CONTACT NAMES: Michael Mahony

SITE 80

LOCALITY: Protestors Falls, Terania Creek, Nightcap NP (28 40'S/153 17'E)
LAND USE: National Park
RESEARCH: Long-term monitoring (since 1992) of the frog community, particularly *Mixophyes fleayi* (M.Mahony)
TEACHING: -
REFERENCES: Report to Environment Australia on the status of the great barred river frog, in research plan for the barred river frogs
CONTACT NAMES: Michael Mahony

SITE 81

LOCALITY: Sharpe's Creek, Gloucester Tops NP (35 24'S/148 03'E)
LAND USE: National Park
RESEARCH: Long-term monitoring (since 1992) of the frog community, particularly *Mixophyes balbus* (M.Mahony)
TEACHING: -
REFERENCES: Report to Environment Australia on the status of the great barred river frog, in

research plan for the barred river frogs
CONTACT NAMES: Michael Mahony

SITE 82

LOCALITY: Naru Reserve, Marks Point (33 04'S/151 38' 30"E)
LAND USE: Public Land
RESEARCH: Long-term banding and radiotelemetry study of Gould's Long-eared Bat (1995 on-going)
TEACHING: -
REFERENCES: -
CONTACT NAMES: Glenn Hoye

SITE 83

LOCALITY: Copeland, near Gloucester (32 00'S/151 50'E)
LAND USE: State Forest
RESEARCH: Long-term banding study of rainforest bat species as well as cave roosting bat Species (1995 on-going)
TEACHING: -
REFERENCES: -
CONTACT NAMES: Glenn Hoye

SITE 84

LOCALITY: Mount Owen, Ravensworth (32 24'S/151 07' 30"E)
LAND USE: State Forest
RESEARCH: Monitoring of bat, Squirrel Glider and frog populations prior to and following mining activities (1992 on-going)
TEACHING: -
REFERENCES: Fly by Night Bat Surveys Pty Ltd and TUNDRA Ltd 1996 Mount Owen Coal Mine Wildlife Management Pilot Study. Report to Mount Owen Coal Mine
CONTACT NAMES: Glenn Hoye

SITE 86

LOCALITY: Bulls Head, Brindabilla Range, ACT (35 24'S/148 50'E)
LAND USE: State Forest?
RESEARCH: Long-term (1979-1984) study of the ecology of the Tasmanian Pipistrelle
TEACHING: -
REFERENCES: Phillips, W.R., C.R.Tidemann, S.T.Inwards and S.Winderlich 1985 The Tasmanian Pipistrelle, *Pipistrellus tasmaniensis*: annual activity and breeding cycles. *Macroderma* 1: 2-11
CONTACT NAMES: Bill Phillips?

SITE 87

LOCALITY: Thermocline Cave, Marble Arch, 35km S Braidwood (35 45'S/140 43'E)
LAND USE: Public Land
RESEARCH: 3 year (1971-1973) study of roosting behaviour of Common Bentwing Bat
TEACHING: -
REFERENCES: Hall, L.S. 1982 The effect of cave microclimate on winter roosting behaviour in the bat, *Miniopterus schreibersii blepotis*. *Aust. J.Ecol.* 7: 129-136
CONTACT NAMES: Les Hall

SITES 91a-g

LOCALITY: a. Travelling Stock Route (TSR 442) between Gwydir Park Rd TO and old Kingstown Rd, including Crown Land along Gwydir River (30 26' 30"S/151 12' 15"E); b. Travelling Stock Route (TSR 5371) along Uralla to Bundarra Road between Caches Creek and Two Mile Creek (30 21'55S/151 14'55"E and 30 19'30"S/151 12' 30"E); c. Travelling Stock

Route along Gulf Creek Rd from Rocky Glen 30 13' 30"S/150 43' 20"E to 30 12' 30"S/150 46' 00"E; d. TSR along Bundarra to Woodsreef Road from north of Coonoor Road TO (30 17' 15"S/150 47' 50"E) to Ironbark Crossing (30 17' 50"S/150 47' 20"E); e. Linton Nature Reserve (30 27' 20"S/150 52' 45"E) and TSR (30 27' 30"S/150 54' 00"E); f. TSR along Woodsreef to Kingstown Rd, including part of Nangahrah Ck (30 22' 05"S/150 47' 50"E to 30 22' 05"S/150 48' 30"E); g. TSR along Yarrowyck Crossing Rd from Myanbah Rd to Gwydir River (30 30' 00"S/151 22' 00"E to 30 28' 10"S/151 21' 20"E)

LAND USE: Crown Land and Nature Reserve

RESEARCH: Research and study sites since the mid-1980s by professional and amateur ornithologists and students. Research in natural values of Travelling Stock Routes; fuel wood resource use; biology of Hooded Robin; use of remnants by Brown Treecreepers; biology of Regent Honeyeater

TEACHING: Use as sites for PhD theses (Uni.New England)

REFERENCES: Williams, M.B. and P.Metcalf 1991 Environmental values of Travelling Stock Routes and Reserves, Armidale District. NPA Armidale

Fitri, L.L. and H.A.Ford 1997 Status, habitat and social organisation of the Hooded Robin

Melanodryas cucullata in the New England region of NSW. Aust.Bird watcher 17: 142-155

Fitri, L.L. and H.A.Ford 1998 Aggression among Hooded Robins *Melanodryas cucullata* and other birds. Corella 22: 24-29

Davis, W.E. and H.F.Recher 1993 Notes on the breeding biology of the Regent Honeyeater.

Corella 17:1-4

Ford, H.A., W.E.Davis, S.Debus, A.J.Ley, H.F.Recher and M.B.Williams 1993 Foraging and aggressive behaviour of the Regent Honeyeater *Xanthomyza phrygia* in northern NSW Emu 93: 277-281

Oliver, D.L. 1998 Ecology and conservation of the endangered Regent Honeyeater *Xanthomyza phrygia* PhD Thesis, Uni New England

Oliver, D.L. 1998 The importance of insects and lerp in the diet of juvenile Regent Honeyeaters: implications for the conservation of an endangered woodland bird. Wildl.Res. (in press)

Oliver, D.L. 1998 The breeding behaviour of the endangered Regent Honeyeater near Armidale, NSW Aust.J.Zool. (in press)

Oliver, D.L., A.J.Ley and M.B.Williams 1998 Breeding success and nest site selection of the endangered Regent Honeyeater near Armidale, NSW Emu (in press)

Oliver, D.L., A.J.Ley and H.A.Ford (in prep.) Significance of the Bundarra-Barraba region for the conservation of the Regent Honeyeater and the preservation of avian diversity.

Ley, A.J. 1990 Notes on the Regent Honeyeater. Aust Bird Watcher 13: 171-173

Ley, A.J. and M.B.Williams 1992 The conservation status of the Regent Honeyeater near Armidale, NSW Aust Bird Watcher 14: 277-281

Ley, A.J. and M.B.Williams 1994 Breeding behaviour and morphology of the Regent Honeyeater. Aust Bird Watcher 15: 366-376

Ley, A.J. and M.B.Williams (in press) Nesting of the Regent Honeyeater near Armidale, NSW Aust Bird Watcher

Ley, A.J., D.L.Oliver and M.B.Williams 1996 Observations on colour-banded Regent Honeyeaters Corella 20: 88-92

Ley, A.J., D.L.Oliver and M.B.Williams 1997 Theft of nesting material involving honeyeaters Corella 21: 119-123

CONTACT NAMES: Andrew Ley

SITE 92

LOCALITY: Sheepstation Creek, near Wiangaree 28 31'S/152 58'E

LAND USE: Border Ranges NP

RESEARCH:

TEACHING: Southern Cross Uni. Undergraduate wildlife survey techniques (1993-97)

REFERENCES: -

CONTACT NAMES: Ross Goldingay

SITE 93

LOCALITY: Brindle Creek, near Wiangaree 28 22'S/153 03'E
 LAND USE: Border Range NP
 RESEARCH:
 TEACHING: Southern Cross Uni. Undergraduate wildlife survey techniques (1993-97)
 REFERENCES: -
 CONTACT NAMES: Ross Goldingay

SITE 94

LOCALITY: Bundjalung NP, near Evans Head (29 07'S/153 26'E)
 LAND USE: National Park
 RESEARCH:
 TEACHING: Southern Cross Uni. Undergraduate wildlife survey techniques (1993-97)
 REFERENCES: -
 CONTACT NAMES: Ross Goldingay

SITE 95

LOCALITY: Station Creek, near Red Rock (29 56'S/153 13'E)
 LAND USE: Yuraygir NP
 RESEARCH: -
 TEACHING: Southern Cross Uni. Undergraduate wildlife survey techniques (1993-97)
 REFERENCES: -
 CONTACT NAMES: Ross Goldingay

SITE 96

LOCALITY: Tucki Tucki Nature Reserve, 11km SE Lismore (28 56'S/153 19'E)
 LAND USE: Nature Reserve
 RESEARCH: Koala ecology studies over four years
 TEACHING: Some community education
 REFERENCES: Gall, B.C. 1980 Aspects of the ecology of the Koala, *Phascolarctos cinereus*, in Tucki Tucki nature Reserve, NSW Aust. Wildl. Res. 7: 167-176
 CONTACT NAMES: Bruce Gall

SITE 97

LOCALITY: Petroi/Diamond Flat, Styx River State Forest, 50km east of Armidale (30 37'S/152 20'E)
 LAND USE: State Forest
 RESEARCH: Studies of dingo population dynamics, movements and diet; impacts upon prey species; ecology of Swamp Wallaby; macropod behaviour; Antechinus ecology
 TEACHING: Used as theses study areas (University of New England)
 REFERENCES: Harden, R.H. 1985 The ecology of the dingo in north-eastern NSW I. Movements and home range Aust.Wildl.Res. 12: 25-37
 Robertshaw, J.D. and Harden, R.H. 1985 The ecology of the dingo in north-eastern NSW II Diet Aust.Wildl.Res 12: 39-50
 Robertshaw, J.D. and Harden, R.H. 1985 The ecology of the dingo in north-eastern NSW III Analysis of macropod bone fragments found in dingo scats. Aust.Wildl.Res. 12: 163-171
 Robertshaw, J.D. and Harden, R.H. 1986 The ecology of the dingo in north-eastern NSW IV. Prey selection by dingoes, and its effect on the major prey species, the Swamp Wallaby. Aust.Wildl.Res. 13: 141-163
 Hollis, C.J., J.D.Robertshaw and R.H.Harden 1986 Ecology of the Swamp Wallaby in north-eastern NSW I.Diet Aust.Wildl.Res. 13: 355-365
 CONTACT NAMES: Robert Harden

SITE 98

LOCALITY: Mt Nardi, Goonimbar State Forest (28 33'S/153 17'E)

LAND USE: State Forest
RESEARCH: The effects of logging regimes on avifauna
TEACHING: None known
REFERENCES: Harden, R.H., R.J. Muir and D.R. Milledge 1986 An evaluation of the strip transect method for censusing bird communities in forests. *Aust. Wildl. Res.* 13: 203-211
CONTACT NAMES: Robert Harden

SITE 99

LOCALITY: Banjo Creek, Compartment 147, Doyles River State Forest, 80km west of Port Macquarie (31 22'S/152 6'E)
LAND USE: State Forest
RESEARCH: Changes *in* rainforest vegetation after logging
TEACHING: None
REFERENCES: King, G.C. and W.S. Chapman 1983 Floristic composition and structure of a rainforest area 25 yr after logging *Aust. J. Ecol.* 8: 415-423
CONTACT NAMES: Bill Chapman

SITE 100

LOCALITY: Box Hole Clearing, 29km west Putty (32 57'S/150 22'E)
LAND USE: Private
RESEARCH: Relationships between vegetation, landform, soils and erosion
TEACHING: None
REFERENCES: Elliott, G.L., R.D. Land and B.L. Campbell 1983 The association of tree species, landform, soils and erosion on Narrabeen sandstone west of Putty, NSW *Aust. J. Ecol.* 8: 321-331
CONTACT NAMES: ?

SITE 101

LOCALITY: Lana, near Armidale (30 38'S/151 18'E)
LAND USE: Private, pastoral
RESEARCH: Macropod ecology between 1974 and 1978
TEACHING: PhD thesis site
REFERENCES: Jarman, P.J. and R.J. Taylor 1983 Ranging of Eastern Grey Kangaroos and Wallaroos on a New England pastoral property *Aust. Wildl. Res.* 10: 33-38
Taylor, R.J. 1983 Association of social classes of the Wallaroo, *Macropus robustus* *Aust. Wildl. Res.* 10: 39-45
Taylor, R.J. 1983 The diet of the Eastern Grey Kangaroo and Wallaroo in areas of improved and native pasture in the New England Tablelands. *Aust. Wildl. Res.* 10: 203-211
Taylor, R.J. 1982 Population composition of the Wallaroo in the New England Tablelands on NSW *Aust. Mamm.* 5: 221-223
CONTACT NAMES: Peter Jarman

APPENDIX 6: BIBLIOGRAPHY

- ANCA 1995 Jervis Bay A Place of Cultural, Scientific and Educational Value Kowari 5
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- York, A. 1997 Long-term effects of repeated fuel-reduction burning: Preliminary results from the F8/2.9 frequent burning study, Bulls Ground State Forest. Report prepared for State Forests of NSW Central Region, Symbiosis Pty Ltd
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- Zimmerman, M., E.S. Nagy and L. Galloway 1987 Nectar dispersion patterns in three Australian plant species *Aust.J.Ecol.* 12: 183-188

APPENDIX 7: C.1 RESEARCH, TEACHING AND REFERENCE SITES WITHIN THE SYDNEY BASIN CRA REGION

- LOCALITY: Barren Grounds Nature Reserve, near Jamberoo (34 40'S/150 45'E)
- LAND USE: Nature Reserve
- RESEARCH: Ground Parrot population studies since 1982 (yearly surveys in cooperation with RAOU Bird Observatory); reproduction dynamics of *Banksia spinulosa*, since 1986; Eastern Bristlebird population studies since 1992 and mammal pollination of plants; 10 years (1983-1994) bird observations by Tony Saunders
- TEACHING: Used by Schools of Biological Sciences and Geography, Uni.Wollongong; community education (bird watching clubs, public courses)
- REFERENCES: Barren Grounds Bird Observatory and Field Studies Centre Reports
- Baker, J. and R.J.Whelan 1994 Ground Parrots and fire at Barren Grounds, NSW: a long-term study and an assessment of management implications. *Emu* 94: 300-304
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Baker, J. 1997 The decline, response to fire, status and management of the Eastern Bristlebird
Pac.Conc.Biol 3: 235-243

Zimmerman, M. and G.H. Pyke 1988 Pollination ecology of Christmas Bells (*Blandfordia nobilis*):
Effects of pollen quantity and source on seed set. Aust J.Ecol. 13: 93-99

Zimmerman, M., E.S.Nagy and L.Galloway 1987 Nectar dispersion patterns in three Australian plant
species Aust.J.Ecol. 12: 183-188

CONTACT NAMES: Current caretakers (RAOU) and Rob Whelan

LOCALITY: Blue Gum Swamp Creek, Winmalee (33 39'48"S/150 36'30"E)

LAND USE: Crown (Blue Mtns NP)

RESEARCH: Long-term bird-banding study – 13 years (1977-1989), ecology of Eastern Spinebills, 4
years bird observations by Tony Saunders (1987-1990)

TEACHING: ?

REFERENCES: Hardy, J.W. and J.R.Farrell 1990 A bird banding study in the Blue Mountains,
NSW. 1. An overview. Corella 14: 1-15

Farrell, J.R. and J.W.Hardy 1993 Survival, seasonal abundance, sex ratio and diet of Eastern
Spinebills *Acanthorhynchus tenuirostris* in the Blue Mountains, NSW. Corella 17: 33-40

CONTACT NAMES: Possibly J.W.Farrell

LOCALITY: Menai, western Sydney (34 01'00"S/151 00'00"E)

LAND USE: Crown

RESEARCH: Long-term bird-banding study of bushland (weekly between 1989-1993)

TEACHING: -

REFERENCES: Egan, K.H. 1997 Seasonal changes in the pollen sampled from nectarivorous birds
visiting an open forest at Menai, NSW Corella 21: 83-87

CONTACT NAMES: Keith Egan

LOCALITY: Longneck Lagoon Nature Reserve, Scheyville (33 36'S/150 54'E),
7km ENE of Windsor

LAND USE: Nature Reserve

RESEARCH: Changes in the bird community over time, based on observations dating back to 1937,
banding data from 1964 to 1994 and census data from 1992 to 1995. Was the first cooperative bird
banding site in NSW (Bill Lane), in about 1975. Thus 25 years bird-banding. Cooperative bird-
banding site (ABBBS) "To study the demography (including abundance, survival and recruitment),
morphology and movement patterns of the species commonly occurring in remnant woodland on
the western edge of Sydney" (Flightlines 21, Jan, 1998)

TEACHING: ?

REFERENCES: Egan, K., J.R.Farrell and D.L.Pepper-Edwards 1997 Historical and seasonal changes
in the community of forest birds at Longneck Lagoon Nature Reserve, Scheyville, NSW Corella
21:1-16

Recher, H.F. 1989 Foraging segregation of Australian warblers (Acanthizidae) in open forest near
Sydney, NSW Emu 89: 204-215

Recher, H.F. and J.D.Majer 1994 On the selection of tree species by Acanthizidae in open-forest
near Sydney, NSW Emu 94: 239-245

CONTACT NAMES: John Farrell

LOCALITY: Ebenezer, near Windsor (33 32'S/150 53'E)

LAND USE: ?

RESEARCH: Long-term studies of birds, particularly vocalization patterns (1986-1993). Site of
many bird studies by Alan Keast since the 1930's (source of information for Keast's ecological
publications)

TEACHING: ?

REFERENCES: Keast, A. 1995 Diel temporal vocalization patterns in the Mistletoebird (*Dicaeum hirundinaceum*) and seasonal abundance relative to the flowering and fruiting of the mistletoe *Dendrophthoe vitellina* Corella 19:2-7
 Keast, A. 1993 Song structures and characteristics: members of a eucalypt forest bird community compared. Emu 93: 259-268
 Keast, A. 1994 The annual cycle in a vocalisation context: a comparison of the Eastern Yellow Robin *Eopsaltria australis* and Jacky Winter *Microea leucophaea* Emu 94: 230-238
 Keast, A. 1985 Bird community structure in southern forests and northern woodlands: a comparison in "Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management" A.Keast, H.F.Recher, H.Ford and D.Saunders (eds) RAOU?Surrey Beatty & Sons
 Keast, A. 1995 Habitat loss and species loss: the birds of Sydney 50 years ago and now Aust Zool. 30:3-25
 CONTACT NAMES: Allen Keast

LOCALITY: Zoologists' Cabin, Royal National Park, at Waterfall Creek, about 4km from Waterfall railway station. 34 08'S/151 00'E
 LAND USE: Royal National Park
 RESEARCH: Used by ornithologists associated with Royal Zoological Society of NSW from about 1929 to about 1944. Only hearthstone remains. Used by Jock Marshall for bowerbird studies, Chaffer for Rufous Whistler and Brown Warbler, and Gilbert for Topknot Pigeon
 TEACHING: Possible
 REFERENCES: Keast, A. 1995 The Sydney ornithological fraternity, 1930s-1950: anecdotes of an admirer. Aust. Zool. 30:26-32
 Chaffer, N. 1929 The Rufous Fantail in the National Park Emu 29: 48-49
 Chaffer, N. 1930 Notes on the Brown Warbler, Emu 30: 58-60
 Marshall, A.J. 1930 The Yellow-throated Scrubwren: a monograph Emu 30: 3-9
 Marshall, A.J. 1954 "Bowerbirds" Oxford University Press, Oxford
 CONTACT NAMES: Allen Keast

LOCALITY: Sunny Corner, 30km east of Bathurst (33 23'S/149 43'E and 33 23'S/149 53'E)
 LAND USE: State Forest, private and Winburndale Nature Reserve
 RESEARCH: 7 year study of territorial songs of the Superb Lyrebird, also Courtney Smithers and John Disney undertook bird studies comparing pine and native forests here in the 1970's
 TEACHING: Used by David Goldney and Sylvia Cardale (CSU) for teaching and research
 REFERENCES: Disney, H.J.de S. and A Stokes 1976 Birds in pine and native forests Emu 76: 133-138
 Powys, V. 1995 Regional variation in the territorial songs of Superb Lyrebirds in the Central tablelands on NSW Emu 95: 280-289
 CONTACT NAMES: Vicki Powys

LOCALITY: Munghorn Gap Nature Reserve, 35 km NE Mudgee 32 25'S/149 50'E
 LAND USE: Nature Reserve
 RESEARCH: Long-term bird studies, cooperative bird-banding site (at least 1985 onwards to today, ABBBS). "To study the demography (including abundance, survival and recruitment), morphology and movement patterns of the species commonly occurring in remnant woodland on the NSW north-west slopes. Birds include Turquoise Parrot, Yellow-tufted Honeyeater, Little Cuckoo-shrike, Rock Warbler and Regent Honeyeater" (Flightlines 21, Jan, 1998). Bird observations by Tony Saunders from 1984 to 1997 (14 years), research on foraging ecology of Noisy Friarbirds and Red Wattlebirds.
 TEACHING: Used by NPWS as a teaching site and bird clubs
 REFERENCES: None known
 CONTACT NAMES: Graham Fry/Tony Saunders

LOCALITY: Capertee Valley, north-west of Lithgow 33 09'S/149 59'E and 33 05'S/150 15'E
 LAND USE: Private

RESEARCH: On-going long-term study of the population biology of Regent Honeyeaters (1993-1998) and their management by NSW/ACT Group of RAOU (SNAG). Monthly census of 16 sites. Also research site of Tony Saunders (foraging ecology of Noisy Friarbird and Red Wattlebird) and 14 years bird observations (1983-1997, on-going)

TEACHING: Community education (volunteer groups)

REFERENCES: Geering, D.J. 1996 Prince of honeyeaters Wingspan 6: 12-15

“Where do the Regents roam?” The Bird Observer May 1998 pp4-7

CONTACT NAMES: David Geering

LOCALITY: Mount Annan, 34 05'S/150 46'E

LAND USE:

RESEARCH: Long term bird-banding site

TEACHING:

REFERENCES:

CONTACT NAMES: Alan Leishman

LOCALITY: Bent's Basin State Recreation Area, near Penrith (33 55'S/150 35'E)

LAND USE: Crown Land

RESEARCH: 12 years bird observations (1983-1995), research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders)

TEACHING: Possible community education (bird clubs and public)

REFERENCES: None

CONTACT NAMES: Tony Saunders

LOCALITY: Blue Mountains National Park, Oaks Site (33 49'S/150 34'E) and Kings Tableland Site (33 49'S/150 25'E)

LAND USE: National Park

RESEARCH: 2 years bird observations at Oaks (1994-1995) and 7 years at Kings Tablelands (1991-1998), research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders)

TEACHING: Community education (bird clubs and public)

REFERENCES: None

CONTACT NAMES: Tony Saunders

LOCALITY: Castlereagh State Forest, near Londonderry (33 45'S/150 45'E)

LAND USE: State Forest

RESEARCH: 8 years bird observations by Tony Saunders (1982-1990), possibly more by Cumberland Bird Observers

TEACHING: Community education (bird clubs and public), HSC biology

REFERENCES: ?

CONTACT NAMES: Tony Saunders

LOCALITY: Clandulla State Forest, near Kandos (32 54'S/149 55'E)

LAND USE: State Forest

RESEARCH: Research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders), 14 years bird observations (1982-1996)

TEACHING: -

REFERENCES: None

CONTACT NAMES: Tony Saunders

LOCALITY: Cumberland State Forest, Pennant Hills (33 45'S/151 05'E)

LAND USE: State Forest

RESEARCH: Used by Cumberland Bird Observers since the 1980's. On-going bird observations

TEACHING: Community education (bird groups and public)

REFERENCES: ?

CONTACT NAMES: Tony Saunders

LOCALITY: Dharug National Park (33 25'S/151 05'E)

LAND USE: National Park

RESEARCH: 12 years bird observations by Tony Saunders

TEACHING: ?

REFERENCES: ?

CONTACT NAMES: Tony Saunders

LOCALITY: Kur-ring-gai National Park (33 35'S/151 15'E)

LAND USE: National Park

RESEARCH: 6 years bird observations by Tony Saunders

TEACHING: -

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: Mitchell Park, Scheyville (33 35'S/150 55'E)

LAND USE: Nature Reserve

RESEARCH: 14 years bird observations by Tony Saunders, part of Long Neck Lagoon-Scheyville complex

TEACHING: Field Studies Centre, used as university teaching site, community education (bird groups and public)

REFERENCES: ?

CONTACT NAMES: Tony Saunders

LOCALITY: Norton's Basin, Wallacia (33 55'S/150 35'E)

LAND USE: Crown?

RESEARCH: Research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders), 13 years bird observations (1986-1998)

TEACHING: Community education (bird observers)

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: Royal National Park (34 05'S/151 06'E)

LAND USE: National Park

RESEARCH: Research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders), 12 years bird observations (1982-1993)

TEACHING: -

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: Stannix Park, near Wilberforce (33 35'S/150 45'E)

LAND USE: Crown land

RESEARCH: 16 years bird observation by Tony Saunders (1982-1997), used by Cumberland Bird Observers since the 1960's

TEACHING: Community education (bird groups)

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: St Marys Towers, Douglas Park (34 15'S/150 42'E)

LAND USE: Private (monastery)

RESEARCH: Research site for foraging ecology of Noisy Friarbird and Red Wattlebird (Tony Saunders), 5 years bird observations (1991-1995)

TEACHING: Community education (bird groups)

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: Sun Valley, near Valley Heights (33 45'S/150 35'E)

LAND USE: Private

RESEARCH: 16 years bird observations by Tony Saunders

TEACHING: -

REFERENCES: -

CONTACT NAMES: Tony Saunders

LOCALITY: University of Western Sydney Campus, Richmond (33 35'S/150 45'E)

LAND USE: Private

RESEARCH: Research site for several projects involving remnant forest and genetics (Tony Saunders – birds; Barry Richardson – invertebrates; Shelley Burgin – reptiles)

TEACHING: Uni Western Sydney

REFERENCES: Ferraro, T.J. and S.Burgin 1993 Amphibian decline: a case study in western Sydney in D.Lunney and D.Ayres (eds) "Herpetology in Australia. A Diverse Discipline" Trans. Royal Zoological Society of NSW, Mosman

CONTACT NAMES: Barry Richardson

LOCALITY: HMAS Sydney, Mosman (33 50'S/151 15'E)

LAND USE: Commonwealth Defence

RESEARCH: Pre- and post control burn monitoring of native vegetation, 6 monthly samples (1994 on-going)

TEACHING: -

REFERENCES: -

CONTACT NAMES: John Pickard

LOCALITY: Ludovic Blackwood Memorial Sanctuary, Pennant Hills (33 44'S/151 04'E)

LAND USE: The National Trust of Australia (NSW)

RESEARCH: Monitoring of urban bushland in an area of Blue Gum High Forest (1976 ongoing)

TEACHING: ?

REFERENCES: Buchanan, R.A. 1987 Blackwood. Ten Years of Bush Regeneration. Assessment of Permanent Transects. Report to the National Trust of Australia

CONTACT NAMES: Roger Lembit

LOCALITY: Ku-ring-gai Flying-fox Reserve, Gordon (14.6ha) 33 53'S/151 13'E

LAND USE: Public Land (Ku-ring-gai Municipal Council)

RESEARCH: Long-term study of Grey-headed Flying-fox (1987-1998), including radio-telemetry studies.

TEACHING: Possibly university, definitely community

REFERENCES: ?

CONTACT NAMES: Robert and Nancy Pallin

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Insect Type Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
	Electronic mail address	m.cofinas@ea.gov.au
DESCRIPTION	Abstract	<p>A database was constructed from data provided by CSIRO Division of Entomology (Australian Insect Collection database). The original data comprised a spreadsheet of specimen names (Order, Genus and Species), type locality (description of location of site), latitude and longitude (where known), and type (holotype, paratype, lectotype).</p> <p>The derived database comprises a listing of places where more than three type specimens have been located. The database comprises type specimen name, description of the locality of the place, and latitude and longitude.</p>
	Search Word	Insect Species, Type Locality, National Estate, Place.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Insect Species, Place, Longitude, Latitude
	Attribute/Field Description	Insect Species=species type Place=location of sites

	Scale/Resolution	1:250 000
DATASET CURRENCY	Beginning date	1788
	Ending date	1998
DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned.
DATASET ENVIRONMENT	Software	ArcInfo.
	Computer Operating System	UNIX.
	Dataset Size	11Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from topographic maps at a scale of 1:100 000 by CSIRO as latitude and longitude to 1 minute. The dataset was received by Environment Australia as an ArcView Shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 Gazetteer and 1:100 00 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Insect species and place are derived from data provided by CSIRO Division of Entomology (Australian Insect Collection database). No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for insect type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys

FURTHER INFORMATION	Further information	Data was provided by CSIRO Division of Entomology (Australian Insect Collection database). The original data comprised a spreadsheet of specimen names (Order, Genus and Species), type locality (description of location of site), latitude and longitude (where known), and type (holotype, paratype, lectotype).
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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Endangered Mosses and Liverworts Type Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
	Electronic mail address	m.cofinas@ea.gov.au
DESCRIPTION	Abstract	A database constructed from data derived from the publication "A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi" Wildlife Australia 1997. Known localities of endangered mosses and liverworts were derived from tables in the publication and geographically referenced.
	Search Word	Endangered Mosses and Liverworts, Natural Heritage, Flora
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.

	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Endangered Mosses and Liverworts, Locality, Longitude, Latitude
	Attribute/Field Description	Endangered Mosses and Liverworts=flora species type Locality=description of location of species.
	Scale/Resolution	1: 250 000
DATASET CURRENCY	Beginning date	1788
	Ending date	1988
DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned
DATASET ENVIRONMENT	Software	ArcInfo.
	Computer Operating System	UNIX.
	Dataset Size	7Kb.
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from original type specimen descriptions located in the publication "A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi" Wildlife Australia 1997. Geographic locations were derived from topographic maps at a scale of 1: 100 000 and gazetteer at a scale of 1: 250 000. The dataset was received by Environment Australia as an ArcView shapefile and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1:250 000 gazetteer and 1:100 00 scale topographic maps.

	Attribute accuracy	Attribute accuracy is unknown. Herpetofauna and locality are derived from the Zoological Catalogue of Australia. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for mosses and liverwort type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	“A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi”, Wildlife Australia 1997.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Localities for Mammal Type Specimens
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	A database constructed from data derived from the publication "Zoological Catalogue of Australia – Mammals" CSIRO Division of Entomology, Australian Government Publishing Service, 1983. Known localities of mammals were derived from descriptions in the publication and geographically referenced.
	Search Word	Mammal Species, Natural Heritage, National Estate, Fauna.
	Geographic Extent Name(s)	Eden, South, North and far North CRA Regions
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Mammal Type Specimens, Locality, Latitude, Longitude
	Attribute/Field Description	Mammal Type Specimens=species type Locality=description of location of species.
	Scale/Resolution	1:250 000.
DATASET CURRENCY	Beginning date	1788
	Ending date	1998

DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned.
DATASET ENVIRONMENT	Software	ArcInfo.
	Computer Operating System	UNIX.
	Dataset Size	6Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only
DATA QUALITY	Lineage	Data collected from type descriptions taken from the Zoological Catalogue of Australia – Mammals and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView Shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1:250 000 scale gazetteer and 1:100 00 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Mammal type specimens are derived from the Zoological Catalogue of Australia. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations for mammal type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	“Zoological Catalogue of Australia – Mammals” CSIRO Division of Entomology, Australian Government Publishing Service, 1983.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Localities for Herpetofauna Type Specimens.
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Localities for Herpetofauna Type Specimens is a database constructed from data derived from the publication "Zoological Catalogue of Australia – Amphibia and Reptilia", CSIRO Division of Entomology, Australian Government Publishing Service, 1983. Known localities of frogs and reptiles were derived from herpetofauna descriptions in the publication and geographically referenced.
	Search Word	Herpetofauna, Locality, Natural Heritage, National Estate, Fauna.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E.
	Type of feature	Point.
	Attribute/Field List	Herpetofauna, Locality, Longitude, Latitude.
	Attribute/Field Description	Herpetofauna=species type Locality=description of location of species.
	Scale/Resolution	1:250 000.
DATASET CURRENCY	Beginning date	1788.

	Ending date	1998.
DATASET STATUS	Progress	Complete.
	Maintenance and update frequency	Not planned.
DATASET ENVIRONMENT	Software	ArcInfo.
	Computer Operating System	UNIX.
	Dataset Size	8Kb.
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from type descriptions taken from the Zoological Catalogue of Australia and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Herpetofauna and locality are derived from the Zoological Catalogue of Australia. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for herpetofauna type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998.
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny. Mount King Ecological Surveys.
FURTHER INFORMATION	Further information	Zoological Catalogue of Australia – Amphibia and Reptilia, CSIRO Division of Entomology. Australian Government Publishing Service, 1983.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Localities for Endangered Lichens
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Localities for Endangered Lichens ia a database constructed from data derived from the publication “A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi” Wildlife Australia 1997. Known localities of endangered lichens were derived from tables in the publication and geographically referenced.
	Search Word	Endangered Lichens, Locality, Natural Heritage, National Estate, Flora.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00’S, 154.00’E, 37.30’S, 148.30’E
	Type of feature	Point
	Attribute/Field List	Endangered Lichens, Locality, Latitude, Longitude
	Attribute/Field Description	Endangered Lichens=flora species type Locality=description of location of species
	Scale/Resolution	1:250 000
DATASET CURRENCY	Beginning date	1788
	Ending date	1998

DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	8Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from type descriptions taken from the publication "A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi" Wildlife Australia 1997, and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView Shapefile and was converted into ArcInfo point coverage. The coverage was also clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 00 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Lichen and locality are derived from the publication "A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi". No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for endangered lichen localities.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	"A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi" Wildlife Australia, 1997.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Threatened Plant Species Type Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Localities for threatened plant species is a database constructed from data derived from the listings of threatened plant species in Schedules 1 and 2 of the NSW Threatened Species Conservation Act 1995 No 101 and from the Australian Plant Name Index database. Where the type localities of threatened plant species were known, these were geographically referenced.
	Search Word	Threatened Plant Name, Locality, Natural Heritage, National Estate, Flora.
	Geographic Extent Name(s)	Eden, South, North and far North CRA Regions
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Threatened Plant Name, Locality, Latitude, Longitude.
	Attribute/Field Description	Locality=description of location of species. Threatened Plant Name=flora species type
	Scale/Resolution	1:250 000.
DATASET CURRENCY	Beginning date	1788

	Ending date	1998
DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	10Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from type descriptions taken from the listings of threatened plant species in Schedules 1 and 2 of the NSW Threatened Species Conservation Act 1995 No 101 and from the Australian Plant Name Index database, and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Data was collected from type descriptions taken from the listings of threatened plant species in Schedules 1 and 2 of the NSW Threatened Species Conservation Act 1995 No 101 and from the Australian Plant Name Index database. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for threatened plant type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys

FURTHER INFORMATION	Further information	Localities for threatened plant species is a database constructed from data derived from the listings of threatened plant species in Schedules 1 and 2 of the NSW Threatened Species Conservation Act 1995 No 101 and from the Australian Plant Name Index database.
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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Localities for Arachnid Type Specimens
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Localities for Arachnid Type Specimens is a database constructed from data derived from the publication "Zoological Catalogue of Australia – Arachnida", CSIRO Division of Entomology, Australian Government Publishing Service, 1985. Known localities of arachnids were derived from descriptions in the publication and geographically referenced.
	Search Word	Arachnida, Locality, Natural Heritage, National Estate, Fauna.
	Geographic Extent Name(s)	Eden, South, North and far North CRA Regions
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Latitude, Longitude, Locality, Arachnida
	Attribute/Field Description	Arachnida=species type Locality=description of location of species
	Scale/Resolution	1:250 000
DATASET CURRENCY	Beginning date	1788
	Ending date	1998

DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	8Kb
ACCESS	Stored Data Format	Digital ArcInfo
	Available format types	Digital ArcInfo
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from type descriptions taken from the Zoological Catalogue of Australia – Arachnida and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Arachnida and locality are derived from the Zoological Catalogue of Australia. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for arachnid type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	“Zoological Catalogue of Australia – Arachnida”, CSIRO Division of Entomology, Australian Government Publishing Service, 1985.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Localities of Caves Sampled for Fauna
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Localities of Caves Sampled for Fauna is a database constructed from cave location data provided by New South Wales National Parks and Wildlife Service (Andy Spate) and from information in the publication "Cave Invertebrate Survey: Toward an Atlas of NSW Cave Fauna" S.Eberhard and A.Spate National Parks and Wildlife Service, 1995.
	Search Word	Cave Fauna, Locality, Natural Heritage, National Estate.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Cave Fauna, Locality, Longitude, Latitude.
	Attribute/Field Description	Cave Fauna=description of cave fauna identified. Locality=description of location of cave.
	Scale/Resolution	1:250 000
DATASET CURRENCY	Beginning date	1994
	Ending date	1994

DATASET STATUS	Progress	Complete
	Maintenance and update frequency	Not planned
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	7Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	Data collected from type descriptions taken from cave location data provided by New South Wales National Parks and Wildlife Service (Andy Spate) and from information in the publication "Cave Invertebrate Survey: Toward an Atlas of NSW Cave Fauna" S.Eberhard and A.Spate, New South Wales National Parks and Wildlife Service, 1995, and located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56.
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Cave fauna and locality are derived from the publication "Cave Invertebrate Survey: Toward an Atlas of NSW Cave Fauna" S.Eberhard and A.Spate, National Parks and Wildlife Service, 1995. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for arachnid type specimens.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny

FURTHER INFORMATION	Further information	Cave Invertebrate Survey: Toward an Atlas of NSW Cave Fauna” S.Eberhard and A.Spate National Parks and Wildlife Service, 1995.
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METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Research Site Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
	Electronic mail address	m.cofinas@ea.gov.au
DESCRIPTION	Abstract	Research Site Localities is a database constructed from data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.
	Search Word	Research Site, Locality, Natural Heritage, National Estate.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00’S, 154.00’E, 37.30’S, 148.30’E
	Type of feature	Point
	Attribute/Field List	Research Site, Locality, Longitude, Latitude.

	Attribute/Field Description	Research Site=Natural History site important for research Locality=description of location of site
	Scale/Resolution	1:250 000
DATASET CURRENCY	Beginning date	1970
	Ending date	1998
DATASET STATUS	Progress	Not planned
	Maintenance and update frequency	Not known
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	8Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	<p>Data collected from type descriptions taken from data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies (for full descriptions of the references cited, and people and organisations contacted see pages 10, 15, 22, 34 and 44 of the CRA/RFA report "Identification of Places of Natural History Significance in New South Wales Comprehensive Regional Assessment Forest Regions", by Dr M. Denny, Environment Forest Taskforce, Environment Australia, 1998).</p> <p>The collected data was located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000 and from original reports. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56</p>
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.

	Attribute accuracy	Attribute accuracy is unknown. Research site localities are derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for research sites.
NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	Data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Teaching Site Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Teaching site localities is a database constructed from reports and scientific literature providing information about areas used for teaching, in addition to information from personal communication. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.
	Search Word	Teaching Site, Locality, Natural Heritage, National Estate.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Teaching Site, Locality, Longitude, Latitude.
	Attribute/Field Description	Teaching Site=Natural History site important for teaching Locality=description of location of site
	Scale/Resolution	1: 250 000
DATASET CURRENCY	Beginning date	1970
	Ending date	1998

DATASET STATUS	Progress	Not planned
	Maintenance and update frequency	Not known
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	8Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	<p>Data collected from type descriptions taken from data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies (for full descriptions of the references cited, and people and organisations contacted see pages 12, 16, 24, 34 and 44 of the CRA/RFA report "Identification of Places of Natural History Significance in New South Wales Comprehensive Regional Assessment Forest Regions", by Dr M. Denny, Environment Forest Taskforce, Environment Australia, 1998).</p> <p>The collected data was located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000 and from original reports. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56</p>
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Teaching site localities are derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations known for Teaching Sites.
NOTES	Notes	

METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny Mount King Ecological Surveys
FURTHER INFORMATION	Further information	Data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.

METADATA CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	Title	Reference Site Localities
	Custodian	Environment Australia.
	Jurisdiction	Australia.
	CRA Project Name	Identification of places of natural history significance in New South Wales Comprehensive Regional Assessment (CRA) Forest Regions.
	CRA Project Number	NA24/EH.
CONTACT ADDRESS	Contact organisation	Environment Australia.
	Contact position	Maria Cofinas.
	Mail Address 1	GPO BOX 787.
	Mail Address 2	15 Moore Street.
	Suburb/Place/Locality	Canberra.
	State/Locality 2	ACT.
	Country	Australia.
	Postcode	2601.
	Telephone	02-6274 1051.
	Facsimile	02-6274 1333.
Electronic mail address	m.cofinas@ea.gov.au	
DESCRIPTION	Abstract	Reference site localities is a database constructed from reports and scientific literature providing information about areas used as reference sites, in addition to information from personal communication, particularly from natural history societies. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.
	Search Word	Reference Site, Locality, Natural Heritage, National Estate.
	Geographic Extent Name(s)	Eden, Southern, Upper North East, Lower North East CRA Regions.
	Geographic Extent Polygon(s)	28.00'S, 154.00'E, 37.30'S, 148.30'E
	Type of feature	Point
	Attribute/Field List	Reference Site, Locality, Longitude, Latitude.
	Attribute/Field Description	Reference Site=Natural History site important as a reference site Locality=description of location of site
	Scale/Resolution	1: 250 000
DATASET CURRENCY	Beginning date	1970

	Ending date	1998
DATASET STATUS	Progress	Not planned
	Maintenance and update frequency	Not known
DATASET ENVIRONMENT	Software	ArcInfo
	Computer Operating System	UNIX
	Dataset Size	10Kb
ACCESS	Stored Data Format	Digital ArcInfo Coverage
	Available format types	Digital ArcInfo Coverage
	Access constraints	To be used for CRA purposes only.
DATA QUALITY	Lineage	<p>Data collected from type descriptions taken from data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies (for full descriptions of the references cited, and people and organisations contacted see pages 12, 16, 27, 35 and 44 of the CRA/RFA report "Identification of Places of Natural History Significance in New South Wales Comprehensive Regional Assessment Forest Regions", by Dr M. Denny, Environment Forest Taskforce, Environment Australia, 1998).</p> <p>The collected data was located as latitude and longitude using topographic maps at a scale of 1:100 000 and gazetteer at a scale of 1:250 000 and from original reports. The dataset was received by Environment Australia as an ArcView shape file and was converted into ArcInfo point coverage. The coverage was clipped to CRA boundaries and reprojected from geographics AMG Zone 55 and 56</p>
	Positional accuracy	Location estimated accurate to 2 kilometres, some possibly up to 20 kilometres. Derived from 1: 250 000 gazetteer and 1:100 000 scale topographic maps.
	Attribute accuracy	Attribute accuracy is unknown. Teaching site localities are derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. No ground truthing or further tests were completed by EA.
	Logical consistency	Consistent method applied.
	Completeness	Database covers all locations for Reference Sites.

NOTES	Notes	
METADATA DATE	Metadata date	June, 1998
METADATA COMPLETED BY	Metadata sheet compiled by	Dr Martin Denny
FURTHER INFORMATION	Further information	Data derived from various reports and scientific publications, in addition to personal communication from individuals and natural history societies. Localities, as geographic references, sometimes provided in the report/paper, or as descriptions of the site and nearest feature.