

# **WESTERN DATA AUDIT AND GAP ANALYSIS**

WESTERN REGION

NSW NATIONAL PARKS AND WILDLIFE  
SERVICE

A project undertaken as part of the  
Western Regional Assessment  
project number WRA 02

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# PROJECT SUMMARY

The Western Data Audit and Gap Analysis Project was aimed initially at auditing existing data and determining gaps in the data required for an assessment to be made, leading to a Regional Forestry Agreement, in areas of the State not already covered by a Comprehensive Regional Assessment. During the early stages of the Project it emerged that the Comprehensive Regional Assessment methods used in the eastern regions of New South Wales would not be suited to western New South Wales due to significant differences in environmental and social conditions.

A number of major environmental planning processes requiring similar data are under way or have been completed in western New South Wales. The existence of these planning processes and the differences in data requirements from an eastern Comprehensive Regional Assessment were realised early in the project and were taken into consideration when fulfilling the Project aims and objectives. The original objectives were broadened to encompass data required for regional planning in western New South Wales. The Resource and Conservation Division, Department of Urban Affairs and Planning are currently developing a draft strategy for the Western Regional Assessment.

The Project aimed to increase awareness of the nature and quality of existing information in western New South Wales by undertaking a widespread search of and providing metadata on digital information. Metadata summarises the properties of a data set, giving the user enough information to decide if the data is suitable for their needs or to provide an explanation of the content of the data received. All New South Wales metadata will be located on the NSW Natural Resources Data Directory. This information can be accessed via the Internet at **[www.nrims.nsw.gov.au](http://www.nrims.nsw.gov.au)**. The NSW Natural Resources Data Directory will also enable information to be easily updated or added to by data custodians.

The project's data audit and gap analysis revealed significant shortfalls in existing information. The project found that all existing base data layers possess at least one of the following:

- a lack of complete coverage across the region
- inconsistent methods used for the collection of similar data types
- variable or unknown reliability
- bias in collection locations

In fulfilling the project's aim of capturing base data, all relevant flora and fauna information gathered was entered into the Atlas of NSW Wildlife. This included information from published reports, environmental impact statements, theses and personal collections.

Included in the project report are the following recommendations:

## **DATA REQUIREMENTS**

That the following potential base data layers are developed for use in regional planning:

- A current tenure and administrative layer
- A digital elevation model
- Aboriginal cultural information at the landscape level and cultural heritage sites
- A comprehensive and uniform vegetation layer derived from structural and floristic data
- Systematic and targeted survey of fauna and flora
- Autecological studies of targeted fauna and flora
- Up-to-date and uniform geology and soils layer
- Up-to-date and uniform metallic minerals, industrial minerals and occurrences
- Up-to-date and uniform construction materials occurrences
- Up-to-date and uniform wood resources information
- Current satellite imagery
- Current and historical land use
- Disturbance history
- Ground water and surface water quality and quantity
- Salinity and flood mapping

## **FUTURE SCOPING**

That scoping exercises be carried out, as part of the approved Western Regional Assessment Strategy, to identify Stakeholders, relevant issues, standard methods and data layers required for regional planning.

## **DATA MANAGEMENT**

That data be managed to maximise its availability to the community and agencies by ensuring that:

- a Western Regional Assessment Data Management Working Group be established
- all current herbaria specimens are databased and investigate linking these
- all base data collected in the future be entered into the relevant database
- existing and proposed projects provide metadata to the NSW Natural Resources Data Directory

These recommendations could be used to guide the Western Regional Assessment Strategy. Some recommendations could be implemented in the near future with minimal additional expenditure, whilst others will require a commitment of significant resources to provide the necessary base data layers.

# 1. INTRODUCTION

## 1.1 BACKGROUND

The Western Data Audit and Gap Analysis Project was aimed initially at auditing existing available data and determining data requirements for a Comprehensive Regional Assessment for forests in western New South Wales. As time progressed, it became apparent that adopting Comprehensive Regional Assessment methods used in the eastern regions of the State would not be suited to western New South Wales due to the:

- differences in the threatening processes present
- differences in types of land ownership
- current low level of reservation
- need to address Aboriginal cultural heritage
- nature and variety of potential Stakeholder groups
- need to assist in addressing other resource allocation issues and
- lack of a requirement for a Regional Forest Agreement

A number of major environmental planning processes requiring similar resource data are underway or have been completed in western New South Wales. It was therefore considered that the Western Regional Assessment was more likely to provide information and assist these planning processes. Consequently the Project Team opted to broaden the range of issues which would be encompassed by this project.

When fulfilling the aims and objectives of the Project, the absence of an agreed framework for a Western Regional Assessment, the presence of these planning processes and the different data requirements for western New South Wales were taken into consideration by the Project Team. The Resource and Conservation Division of the Department of Urban Affairs and Planning is currently developing a draft strategy for the Western Regional Assessment.

It is important to stress that the recommendations contained in this report focus on the base data layers. When the Western Regional Assessment strategy is finalised, further workshops may be needed to determine additional data required by end users of the Western Regional Assessment. Without suitable base data layers, additional information is difficult to generate or is of very little use in a regional planning context.

## 1.2 AIMS

The aim of the project was to:

Provide advice to government on information required for regional planning in western New South Wales.

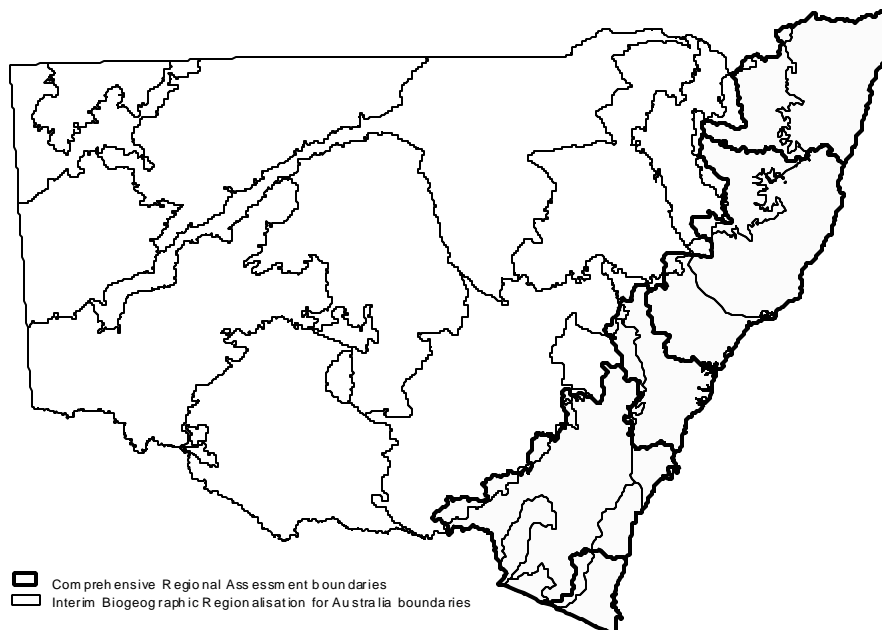
The project consisted of the following objectives:

- comprehensive data audit of existing information
- capture of base data layers by digitising and data entry of existing information
- analysis of the gaps in the existing information which needed to be filled prior to a comprehensive regional assessment

The Project aimed to increase awareness of all forms of existing information by undertaking a widespread search and providing relevant metadata statements. Metadata can simply be explained as data about data in a structured form. Accepted standards for storing metadata have been defined by the Australian and New Zealand Land Information Council. With centralised metadata, all information is accounted for in one database, without any of the issues associated with physically storing the actual data layers. Metadata from this project will enable users to find information on data and is easily accessed by all interested persons via the Internet and can be easily added or updated to by data custodians.

## 1.3 STUDY AREA

The study area consisted of all areas of New South Wales that were not yet covered by a Comprehensive Regional Assessment as shown in figure 1.



**FIGURE 1.** AREA COVERED BY THE WESTERN DATA AUDIT AND GAP ANALYSIS PROJECT.



## **1.4 PROJECT MANAGEMENT**

A Project Team consisting of representatives from the Department of Urban Affairs and Planning, NSW National Parks and Wildlife Service, State Forests of NSW, Department of Land and Water Conservation and the Department of Mineral Resources oversaw the project.

The Project proposal identified that the role of the Project Team was to:

- set standards for data capture and storage
- ensure that end user needs be taken into consideration
- provide direction and guidance for prioritising the data audit
- ensure the collaboration of information custodians
- review the progress of the project
- ensure the completed project provides all Stakeholders with the collated information in a useable form

The Resource and Conservation Assessment Council provided funding for the Project. This funding was allocated to the NSW National Parks and Wildlife Service who provided a Project Manager to assist the Project Team.

# 2. METHODS

## 2.1 BASE DATA LAYERS

The Project Team identified base data layers and these were refined at the workshop with the resulting list as shown in table 1. The theme headings were chosen to comply with the key words of the Australian and New Zealand Land Information Council metadata standard. These base data layers were identified as a significant requirement for existing and future regional planning processes in western New South Wales. Appendix 1 contains metadata for select, available data layers.

| THEME                   | DATA LAYER                              |
|-------------------------|---|
| FAUNA                   | Species survey data                     |
|                         | Autecological studies                   |
|                         |   |
| FLORA                   | Species survey data                     |
|                         | Autecological studies                   |
|                         |   |
| GEOSCIENCE              | Geology                                 |
|                         | Metallic Minerals Occurrences           |
|                         | Industrial Minerals Occurrences         |
|                         | Construction Materials Occurrences      |
|                         | Soil / Regolith / Superficial Lithology |
|                         |   |
| HERITAGE                | Aboriginal Landscape                    |
|                         | Cultural Heritage Sites                 |
|                         |   |
| LAND                    | Tenure and Administration               |
|                         | Disturbance History                     |
|                         | Current and Historical Land Use         |
|                         | Digital Elevation Model                 |
|                         |   |
| PHOTOGRAPHY AND IMAGERY | Landsat TM                              |
|                         | SPOT                                    |
|                         |   |
| VEGETATION              | Consistent Structural and Floristic     |
|                         | Wood Resources                          |
|                         |   |
| WATER                   | Ground Water Quality / Quantity         |
|                         | Surface Water Quality / Quantity        |
|                         | Rivers and Stream Order                 |
|                         | Wetlands                                |
|                         | Salinity Mapping                        |
|                         | Flood Mapping                           |
|                         |   |

**Table 1.** Identified Base Data Layers.

## **2.2 DATA AUDIT**

The Western Data Audit and Gap Analysis Project used a range of methods to locate existing information from numerous data sources. This ensured that as many data sources as possible, from both government and the community, could be contacted. The information that was most relevant to the project was data that would need to be converted into digital form to make it more accessible to end-users.

### **2.2.1 Key Contacts**

A contact spreadsheet was constructed in order to track potential data holders. The list included representatives from state government, local government, universities, conservation groups, environmental consultants and individuals with specialist knowledge. This was compiled from various sources, including the:

- NSW National Parks and Wildlife Service Community Relations Database
- NSW National Parks and Wildlife Service Wildlife Atlas Data Licence Database
- Threatened Species Conservation Flora and Fauna Consultants Register
- 'Greenguide'
- Telstra Yellow Pages

### **2.2.2 Universities**

In order to gain access to data contained in Honours, Masters and Doctors of Philosophy theses held at universities, a project staff member visited the University of Sydney, Macquarie University and the University of New South Wales. University academics and other staff members in the departments of biology, zoology, botany and geography were interviewed about their own research and that of previous students. Potentially useful theses were obtained from school libraries or restricted collections and where possible, any relevant data were photocopied and the methods and author noted. Other universities within New South Wales were contacted to obtain any information they possessed.

### **2.2.3 Advertisement**

An advertisement entitled 'Call for public contributions to the Atlas of NSW Wildlife' was placed in the following regional newspapers:

- |                              |                       |                         |
|------------------------------|-----------------------|-------------------------|
| ■ Albury Border Mail         | ■ Broken Hill Truth   | ■ Condobolin Lachlander |
| ■ Country Leader             | ■ Dubbo Daily Liberal | ■ Hay Riverina Grazier  |
| ■ Hillston Ivanhoe Spectator | ■ North West Magazine | ■ Northern Daily Leader |
| ■ Rural News                 | ■ Sunraysia Daily     | ■ The Land              |
| ■ Wagga Daily Advertiser     | ■ Western Magazine    |                         |

The advertisements contained a request for contributions of site specific flora or fauna species records, as well as other wildlife related information in the form of notebooks, species lists or unpublished reports. A copy of the advertisement is contained in appendix 2.

As a consequence of the advertisements, interviews for the purpose of promoting the data audit process were requested by ABC Regional Radio. A member of the NSW National Parks and Wildlife Service - Wildlife Data Unit gave the interview which explained the project, the use of the Atlas of NSW Wildlife and encouraged people with information to contact the data audit staff.

#### **2.2.4 Literature Search**

Literature used to obtain records included Environmental Impact Statements, Review of Environmental Factors, academic theses and species lists from the Department of Land and Water Conservation clearing application assessments. Any flora and fauna data found in published literature from the literature search were entered into the NSW Wildlife Atlas.

Numerous databases exist that can be searched for topics related to the environment. The National Library of Australia carried out a search for articles relating to fauna and flora in Western NSW. This was unable to be finalised due to the very broad nature of the request. However, these databases may be very beneficial for a specific search. A list of some of the relevant databases able to be searched is given in appendix 3.

#### **2.2.5 NSW Natural Resources Data Directory**

The NSW Natural Resources Data Directory was searched using the following key words:

- |           |              |
|-----------|--------------|
| ■ ecology | ■ fauna      |
| ■ flora   | ■ forests    |
| ■ land    | ■ vegetation |

The output was then crosschecked against known information. When potentially suitable data were identified, an attempt was made to obtain the information.

### **2.3 DATA CAPTURE**

Data considered important to regional planning, where possible, were captured in digital form through data entry, digitising or the preparation of metadata.

Hardcopy data such as photocopied species lists were entered into an Excel spreadsheet before being entered into the Atlas of NSW Wildlife. Spelling and naming checks were performed by checking each data set against either the Census of Australian Plants or the Census of Australian Vertebrates and then with expert NSW National Parks and Wildlife Service staff. Data sets that had been provided digitally were formatted for ease of entry into the Atlas of NSW Wildlife.

Suitable data in map form were digitised into a Geographic Information System. Reference coordinates were marked manually from map sheets, before being digitised. Digitised maps were checked for continuity with adjacent maps.

Metadata statements were created to the Australian and New Zealand Land Information Council standards as per appendix 4. Local knowledge and information gained from examination of the data sets were used to compile the metadata.

## 2.4 GAP ANALYSIS

When the framework of the Western Regional Assessment is finalised, more specific data layers and information may be required for certain projects. Themes about which further data may be required include socio-economic, salinity, groundwater, artesian bore sites and the like.

Existing data sets for each of the base data layers were assessed to determine their usefulness for regional planning purposes. Information outside the base data layers or of limited coverage was given a lower priority than information that contributed to a base data layer.

For the existing regional data layers, all relevant data were identified by the project and reviewed for their usefulness to regional planning by the Project Team and other relevant experts.

Gaps in the base data layers for western New South Wales and within each bioregion were then identified. Recommendations were then made in order to fill these identified gaps.

Should the Resource and Conservation Assessment Council accept these recommendations detailed project proposals to fill these gaps would then need to be developed to determine the likely methodology and costs of individual projects.

## 2.5 PROJECT WORKSHOP

A workshop was held on Monday 3<sup>rd</sup> May 1999. The following organisations were invited to attend:

- |   |                                       |
|---|---------------------------------------|
| ■ Department of Land and Water Conservation     | ■ Department of Aboriginal Affairs*   |
| ■ Department of State and Regional Development* | ■ Department of Mineral Resources     |
| ■ Environmental Protection Authority*           | ■ NSW Fisheries*                      |
| ■ Local Government and Shires Association       | ■ Macquarie University                |
| ■ National Parks Association                    | ■ National Parks and Wildlife Service |
| ■ Department of Urban Affairs and Planning      | ■ NSW Agriculture                     |
| ■ State Forests of New South Wales              | ■ Royal Botanic Gardens Sydney        |
| ■ Forest Products Association                   | ■ Australian Museum                   |

(\*) Absent.

The program for the day was as follows:

| <b>TIME</b> | <b>ACTIVITY</b>   | <b>NOTES</b>   |
|-------------|---|--|
| 0915        | Registration  | Flights leave Sydney 0800                                |
| 0930        | Welcome<br>Introduction   | Dr Mike Fleming<br>Noel Mawbey - Facilitator             |
| 0945        | <u>Results:</u><br>Data audit<br>Data capture<br>Gap analysis   | Ed Knowles   |
| 1015        | Questions   | Project Team   |
| 1030        | Morning Tea   |  |
| 1100        | <u>Recommendations:</u>   | Ed Knowles   |
| 1145        | Clarifications / Questions  | Project Team   |
| 1215        | Lunch   |  |
| 1300        | <u>Workshop Sessions:</u><br>Group 1 - Future Scoping<br>Group 2 - Data Requirements<br>Group 3 - Data Management | Chairs:<br>Rex Bowen<br>Mike Fleming<br>Malcolm Stephens |
| 1500        | Afternoon Tea   |  |
| 1530        | Report back to whole group  | Noel Mawbey - Work in large group                        |
| 1615        | Summary and closing remarks   | Mike Fleming   |
| 1630        | Finish  | Flights leave Dubbo 1720                                 |

The handouts used in the workshop sessions can be found in appendix 5.

# 3. RESULTS

This project devoted a significant proportion of time adding hardcopy information to existing digital databases. The relative time spent on each part of the project's activities is illustrated below:

| <b>TASK</b>  | <b>TIME %</b> |
|--------------|---------------|
| Data Capture | 45            |
| Data Audit   | 30            |
| Gap Analysis | 10            |
| Report       | 10            |
| Workshop     | 5             |

## 3.1 DATA AUDIT

The data layers were audited for coverage and quality. A judgement was then made regarding their use in regional planning, see appendix 6.

A total of 1205 individuals and organisations were contacted. The contact list included representatives from government departments, universities, conservation groups, environmental consultancies, local councils and a range of individuals with relevant knowledge were contacted. The responses from each are summarised below:

|                   | <b>Government<br/>Agencies</b> | <b>Conservatio<br/>n Groups</b> | <b>Council<br/>s</b> | <b>Consultan<br/>ts</b> | <b>Universitie<br/>s</b> | <b>Individual<br/>s</b> |
|-------------------|--------------------------------|---------------------------------|----------------------|-------------------------|--------------------------|-------------------------|
| Data received     | 29                             | 7                               | 14                   | 56                      | 19                       | 58                      |
| No data received  | 106                            | 68                              | 65                   | 604                     | 26                       | 48                      |
| Unable to contact | 5                              | 15                              | 5                    | 40                      | 15                       | 25                      |

## 3.2 DATA CAPTURE

### 3.2.1 Data Entry

More than 100,000 new records will have been added to the Atlas of NSW Wildlife as a result of this project. These included, but were not limited to records from:

- regional herbaria
- published floristic lists in Cunninghamia 1(1) 1981, 2(1) 1985 and 3(1) 1993
- Environmental Impact Statements prepared since 1994
- universities and academics
- personal collections

The Department of Mineral Resources will provide a preliminary listing of mineral deposit types. These could then be used to develop mineral potential models to identify the possible distribution of mineral resources in western New South Wales.

### 3.2.2 Digitising

A vegetation map covering the whole of Coonabarabran Shire at 1:50000 scale was digitised by the project. John Whitehead had created this hard copy map and had ground-truthed much of the vegetation.

Existing forest type and wood resource information covering State Forests NSW tenure in western New South Wales was also digitised.

### 3.2.3 Metadata

Metadata prepared by the project covered data sets within a number of the base data layers.

The Department of Land and Water Conservation was contracted to create metadata for all data sets held for western New South Wales including all digital and non-digital data held by the Department.

The Department of Mineral Resources provided metadata for relevant geoscientific data as an overview of existing information.

All metadata generated by the Western Data Audit project was provided to the NSW Natural Resources Data Directory to allow future access for Stakeholders. This can be accessed via the website at [www.nrims.nsw.gov.au](http://www.nrims.nsw.gov.au). The original custodians retain the actual data within their own systems.

## 3.3 GAP ANALYSIS

The gap analysis is shown for western New South Wales in appendix 6. The existing data on this list were analysed to determine gaps across western New South Wales and within each bioregion.

**From the spreadsheet it can be seen that there are no existing base data layers of suitable quality or coverage for whole of western New South Wales.** Some layers are suitable for some of the bioregions. Many of the bioregions only have partial coverage by some base data layers whilst other layers are completely missing or are not of a suitable scale or quality to be useful for regional planning purposes.

Results from each theme are discussed below.



### **3.3.1 Land**

The project identified shortfalls in the type and extent of information about land ownership. It is proposed that future land tenure data layers include information about land ownership, mining tenure, current reserves, administrative boundaries, zoning status, property agreements and conservation agreements. All line-work should be based upon the digital cadastre.

The GEODATA 9-Second Digital Elevation Model gives the only consistent cover of western New South Wales. With a cell size of approximately 250m, its use in regional planning is limited. For a Digital Elevation Model to be useful for use in regional planning it needs to have at least 100m resolution, although 50m or even 25m would be ideal.

### **3.3.2 Heritage**

The Aboriginal Sites Register records known Aboriginal relics and Aboriginal places. Whilst the Register covers the whole State, it contains only site specific records. The register lacks information about how its records fit into a broader landscape context. The data contained in the Register is biased to some extent by factors such as accessibility and areas subject to development assessment such as proposed mines, roads and pipelines. Some of the information held is confidential, and can not be used by the general public. No systematic collection or modelling of information about Aboriginal Heritage across western New South Wales has occurred.

The State Heritage Inventory lists identified non-indigenous and Aboriginal heritage items from various statutory sources. The State Heritage Register lists those items of state significance. There has been no systematic assessment of heritage items across western New South Wales.

The National Estate Register also lists identified non-indigenous and Aboriginal heritage items although again there has been no systematic assessment of heritage items across western New South Wales.

### **3.3.3 Flora**

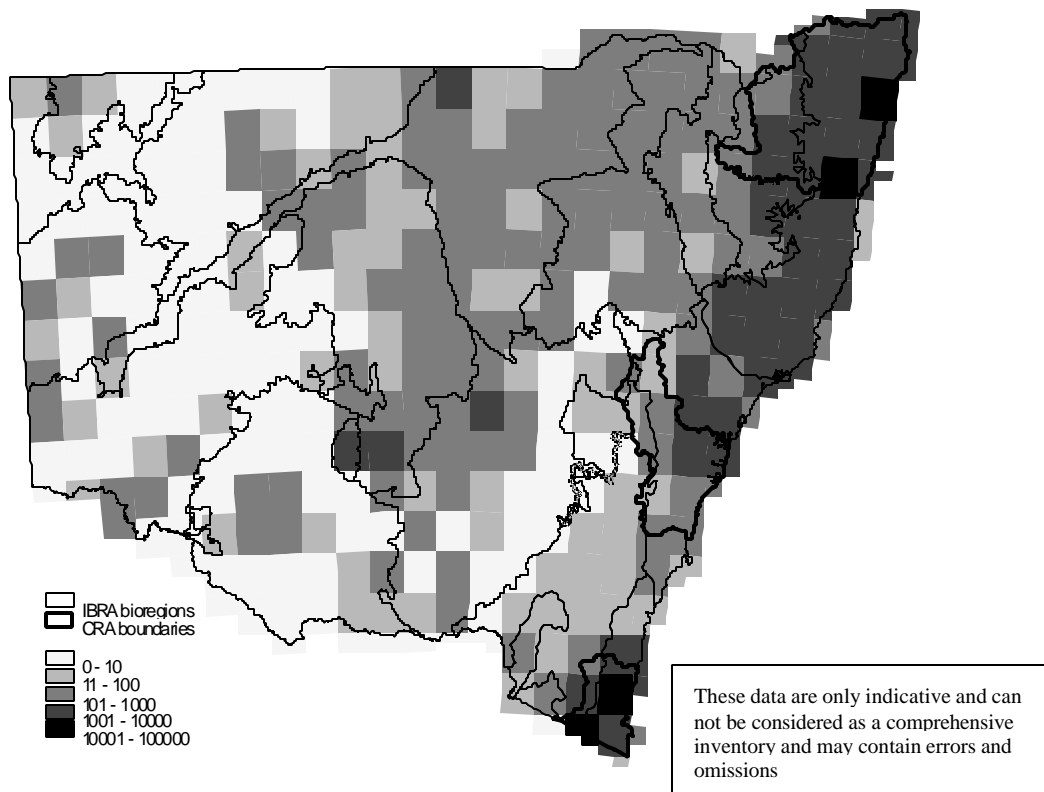
Herbaria hold a significant quantity of point data that is virtually unusable to planning bodies until it is converted into digital form. In the past large numbers of specimens were taken to herbaria outside of New South Wales. For the specimens that have been vouchered, much of the ecological information was not entered onto the labels.

The National Parks and Wildlife Service stores publicly available wildlife records on the Atlas of NSW Wildlife. This information is sourced from State Forests, NSW National Parks and Wildlife Service and the general public. There is a significant bias in the point data towards flora found near major roads and other developments.

Figure 2 shows the number of flora records per 1:10000 map sheet in the Atlas of NSW Wildlife. It can be seen that the number of records across western New South Wales is consistently low. For some areas there are no records. The distribution of the sightings on a map sheet may also be very confined. The reliability of records entered into the Atlas are also variable. This is recorded with each siting.

Recently a National Parks and Wildlife Service project has entered into the Atlas of NSW Wildlife all threatened species records from herbaria in New South Wales, Australian Capital Territory, Victoria and Queensland. The project was funded through the Threatened Species program.

There are also some flora distribution models for species generated by the modelling system Bioclim. This modelling is based on known sightings of a species, using similarities in climatic conditions as the basis for mapping where that species is likely to occur. This is not as robust as other modelling techniques that could be used if additional information was known about a species and more base data existed. Using Bioclim has another drawback in that areas of climatic extreme do not show up as potential habitat.



**FIGURE 2.** FLORA RECORDS PER 1:100 000 MAP SHEET IN THE ATLAS OF NSW WILDLIFE.

### 3.3.4 Vegetation

#### Existing maps

Differing standards may be necessary according to the scale and purpose of mapping. For example regional planning, property planning and fire management planning will all require different standards of mapping. The National Land and Water Resources Audit has provided funding for developing standards and protocols for upgrading and updating the M305 structural vegetation layer. Work is also underway to develop consistent methods for vegetation mapping across New South Wales.

Western New South Wales is partially covered by a number of vegetation data sets.

The largest data set in spatial extent and data available is from the Murray Darling Basin Vegetation Mapping Project, also known as M305. It consists of structural vegetation data and woody / non-woody data layers. With the structural vegetation data, the mapping units may represent attributes on the ground however some preliminary investigations have revealed inconsistencies. The floristic information for the whole data set requires further work to validate it.

Work is being done to develop a methodology to reduce the numerous structural vegetation categories to a useable number for regional planning purposes. The data is currently being used inconsistently across western New South Wales for Regional Vegetation Management Plan vegetation maps, as it is the best available data where required, more detailed mapping has not occurred.

The NSW National Parks and Wildlife Service has produced and is currently producing a series of vegetation maps across the wheat belt of central New South Wales. This does not cover the whole of western New South Wales and maps woody vegetation greater than 20% canopy cover of remnants greater 10 hectares. With increased resources this mapping could be improved and extended.

Royal Botanic Gardens mapping covers the south west of New South Wales and is mapped at the same scale as the wheat belt mapping. This mapping also needs its reliability checked.

The Eastern Bushlands Database covers only the eastern edge of the Western Regional Assessment study area. It would not be suitable for regional planning work as it is not consistent with other mapping and the floristic data are relatively poor.

All above data sets only map greater than 20% canopy cover and therefore do not include grasslands and shrublands. The maps are based on limited sample sites. Due to the inconsistent mapping and data collection methods it is very difficult to mesh these data sets to generate one meaningful map set. Some areas such as the South West Slopes and Broken Hill may still not be covered adequately.

Pickard's 1:1000000 and Beadle's vegetation maps are useful for broad state planning but are of limited use at a regional level because of their scale. These maps are not quadrat based.

Some Local Councils, Rural Lands Protection Boards, State Forests and National Parks and Wildlife Service have some vegetation mapping that generally only covers some of their tenure and again is to varying standards and for varying uses.

### **Pre-clearing maps**

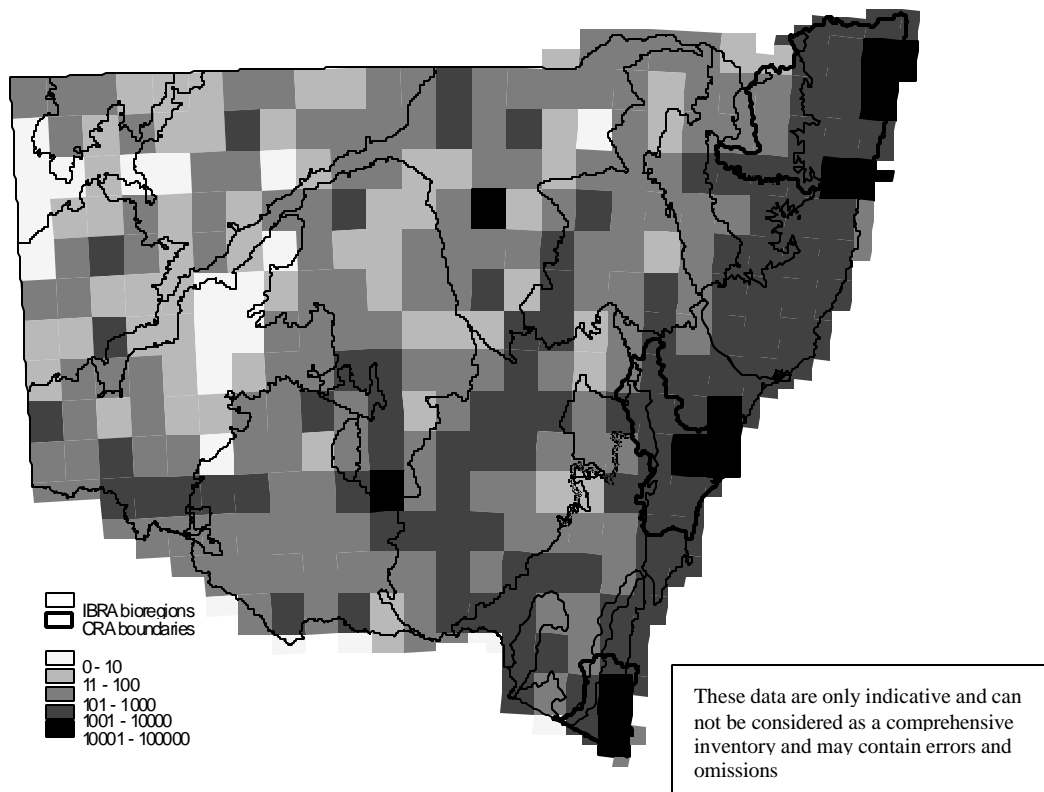
There is an understanding that for regional vegetation management plans to determine suitable conservation targets for each plant community, there is a need for vegetation mapping to show the likely status of plant communities before clearing took place. With the exception of information relating to the Southern Mallee Regional Planning area such data sets do not exist across New South Wales. No standard methodology has been agreed as to for developing a pre-clearing vegetation layer. CSIRO is currently undertaking a study to address this issue. The study aims to establish priorities for conservation and revegetation by predicting pre-clearing vegetation.

### **3.3.5 Fauna**

The Atlas of NSW Wildlife records are not based on systematic surveys across western New South Wales. As figure 3 shows, the number of records per 1:100 000 map sheet are variable. Even areas that have a relatively high number of records are likely to be areas such as the Macquarie Marshes, that have been studied intensely, yet the rest of the map sheet has very few records. The quality of the records indicating possible bias towards particular species, reserves, main roads, pipe lines, development sites or where interest groups operate is not shown. A breakdown of the sightings by class can be found in appendix 7.

CSIRO, Australian Museum, RAOU and NSW Bird Atlasers and State Forests of NSW manage other databases. These databases face similar issues to those faced by the Atlas of NSW Wildlife. Some historical records also exist in Museums outside of Australia, mainly in Europe.

There are also some fauna distribution models for species generated by the modelling system Bioclim. This modelling is based on known sightings of a species, using similarities in climatic conditions as the basis for mapping where that species is likely to occur. This is not as robust as other modelling techniques that could be used if additional information was known about a species and more base data existed. Using Bioclim has another drawback in that areas of climatic extreme do not show up as potential habitat.



**FIGURE 3.** FAUNA RECORDS PER 1:100 000 MAP SHEET IN THE ATLAS OF NSW WILDLIFE.

### 3.3.6 Geoscience

Systematic 1:250,000 Standard Series geological mapping in New South Wales commenced in the early 1960s and continues to the present. Quality of the mapping is variable, from reconnaissance to detailed, from original data collection to incorporation of University theses and other publications. Edge matching between different standard sheets usually has not been done. The format of individual 1:250,000 Standard map sheets is also variable, from a majority in hard copy format to more recent digital availability. Data collection would have been at scales varying from 1:100,000 to 1:25,000. Reliability of final product is 1:250,000, with some areas having 1:100,000 reliability.

Databases exist for metallic and industrial mineral occurrences and for construction materials sites. These are generally available in digital format. Metmin is the metallic minerals database and Indmin the database for industrial minerals and construction materials. The information relating to some parts of western New South Wales is incomplete or inadequate.

Data on regional geoscience projects, geochemistry and drill holes in the western region is being gathered by the Department of Mineral Resources through a number of projects funded under the State Government's Discovery 2000 Program. These projects would not provide a uniform coverage across the western region, but will provide valuable additional information to inform regional planning.

There are few areas in western New South Wales about which energy resources are recorded. There is a coal resource in the Oaklands-Coorabin Basin and petroleum and gas exploration is taking place within the region.

Regional geophysical coverages consist of 1960s and 1970s airborne geophysical (mainly magnetics) surveys conducted by the Bureau of Mineral Resources (now Australian Geological Survey Organisation) and surveys for petroleum exploration. Generally the interline spacing of these surveys is large (1.6km and greater). Some more recent regional surveys conducted in the 1980s and 1990s over selected 1:250,000 areas have interline spacings of the order of 400 m and include magnetic and radiometric data. Some have closer spacing. Airborne surveys conducted over Exploration Licences usually cover smaller areas, but some of the surveys of a group of adjoining licences may be of value as a regional tool. An index of these surveys is held by the Department of Mineral Resources contained in the Aerofind database.

Systematic mineral potential assessment is essential in understanding the resource heritage of a region. This is a derived coverage, using all geoscience coverages and is discussed further below in Section 5.1.7. Mineral potential analysis has not been undertaken in western New South Wales.

### **3.3.7 Photography and Imagery**

Due to the methods which satellites collect data, it is readily available to be purchased. However the regular collection of the data does not mean that this information will of use to the task at hand; ie the image may be covered in cloud. The last whole-of-government, whole-of-New South Wales data set was purchased in 1994. For current planning purposes this could be considered to be out of date.

## **3.4 PROJECT WORKSHOP**

The write up of the workshop sessions can be found in appendix 8.

# 4. DISCUSSION

In accordance with the project aims the Western Data Audit and Gap Analysis project was required to provide:

- comprehensive data audit of existing information.
- capture of base data layers by digitising and data entry from existing information.
- analysis of the gaps in the existing information that need to be filled before a comprehensive regional assessment.

The Western Data Audit and Gap Analysis project was able to meet these aims. Much of the project's effort focussed on ensuring that existing data sets within the base data layers were identified and if possible, the data or at least the metadata were captured in digital form. This has been invaluable in providing more understanding of what data are available or unavailable for regional planning purposes in western New South Wales.

**The important conclusion from the gap analysis is that there are no regions of western New South Wales that have all the required base data layers to consistent standards.**

Whilst some regional planning processes are using what they have available, a suite of consistent, current base data layers need to be developed across western New South Wales. Recommendations are made regarding the need to prepare these data layers.

A number of issues relating to data management were identified during the course of the project. These issues are relevant to most data collection and management projects, not just those related to the Western Regional Assessment. Recommendations to address some of these issues are made in the next section.

## 4.1 DATA AUDIT

The results of the data audit demonstrate that a low proportion of contacts were able to provide relevant data. This may in part be explained by the shortage and poor quality of existent data, including flora and fauna data, from western New South Wales (see Section 5.3). It also emerged that many of the contacts were not relevant to the area targeted by the audit. A large number of contacts did not deal with flora or fauna records or did not possess data originating from western New South Wales. The audit results for consultants provide an example of this. Of the relatively low proportion involved in environmental consultancy, the majority were concerned or familiar with data from eastern New South Wales. A similar pattern emerged in respondents from universities and conservation groups.

In many cases where relevant records were identified it was not necessary for the contact to contribute the records for the audit. This was because their information had been drawn initially from the Atlas of NSW Wildlife. This was particularly true for many of the Councils that use Atlas records in State of Environment Reporting, Local Environment Plans and other similar documents.

In addition to the contacts that were unable to provide data, a small fraction were unwilling to do so. Such contacts commonly cited their concerns regarding ownership or use of intellectual property or their unwillingness to devote the necessary time to collating the information. Also included in this category are a number that did not respond to repeated contact attempts.

The NSW Natural Resources Data Directory is a digital directory of information on New South Wales. It is managed by the Department of Land and Water Conservation and is readily accessible via the Internet at [www.nrims.nsw.gov.au](http://www.nrims.nsw.gov.au). The web page is shown in figure 4.

Simple Search - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print

Address <http://www.nrims.nsw.gov.au/nrdd/simple.html> Go Links >>

**NSW Natural Resources Data Directory**

**Simple Search**

Database Name: nrdd  
Total records: 3228

Field:  Term:  Weight:

Field:  Term:  Weight:

Field:  Term:  Weight:

Enter maximum number of hits to retrieve:

[Back](#) [Simple](#) [Boolean](#) [Advanced](#) [About](#) [Technical](#)

LAND & WATER CONSERVATION

Done Internet

**FIGURE 4.** THE SIMPLE SEARCH PAGE FOR THE NSW NATURAL RESOURCES DATA DIRECTORY.

The directory summarises data by the use of metadata. Metadata are perhaps most simply defined as “data about the data”. A more formal definition is that metadata are descriptive information about the content, quality, condition and other characteristics of data that has been collected for a particular purpose.

Metadata are an important aspect of data maintenance and are important in providing information about data to potential users. For a data set, metadata can inform potential users of its:

- availability
- contact information
- limitations and accuracy
- means of access
- required processing for use

The data directory allows a user to see this information for all data sets that exist in the directory. There are also numerous options for searching the directory. If potential users are unaware of the existence of a data set, or if there is insufficient information available to assess the suitability of the data set, valuable resources may be wasted in wrongly using the data or duplicating existing data.

The use of such a dynamic updateable directory system was considered very important to the project to allow ongoing usage throughout the life of the Western Regional Assessment, currently expected to be at least six years. This is important so that all Stakeholders at any time during and after the Western Regional Assessment may easily find out what information is available for their area of interest and who to contact to obtain the data. The NSW Natural Resources Data Directory is currently in draft form and will be up to date by the end of June 1999.

## 4.2 DATA CAPTURE

Data from relevant PhD's and MSc's post 1994 EIS's, DLWC Far West Region Herbaria all published floristic lists from *Cuninhamia*, for western New South Wales, have now been captured in digital form. The individuals listed in appendix 9 have supplied additional major data sets. In future these data sources will not need to be searched again, except for historic records.

## 4.3 GAP ANALYSIS

The results of the Western Data Audit and Gap Analysis project confirm much of what various professionals, organisations and individuals dealing with natural resource management in western New South Wales have previously identified. The project has found that:

- Many base data layers suitable for regional planning do not exist across large parts of western New South Wales.
- Uniform agreed standards for data collection for many base data layers do not exist.
- Data layers that do exist are often of variable quality. They may lack ground truthing, are missing vital components, are not to agreed standards, lack coverage across western New South Wales, or are inconsistent across the state. This inconsistency is commonly due to a lack of standards or coordination and an absence of integration into planning processes.
- Data are collected by numerous organisations or groups for varying reasons and to various standards. An example of this can be found in the number and variable quality of existing vegetation layers across New South Wales, all of which use different vegetation units and methodologies.
- To provide consistent base data layers suitable for numerous planning processes it is necessary to have commitment to a coordinated, integrated and suitably resourced data collection process.

## 4.4 PROJECT WORKSHOP

Holding the workshop enabled participants to be informed, in a semi informal setting, about what the project had achieved and to refine the recommendations by drawing on participants' experiences.



# 5. RECOMMENDATIONS

## 5.1 DATA REQUIREMENTS

This section identifies the proposed base data layers required to assist regional planning in western New South Wales. Base data layers contain measurements of what can be physically recorded on the ground. These layers are then used to generate derived and modelled data layers.

The quality and extent of existing information covering western New South Wales is inadequate. The following proposals seek to improve the information for regional planning in western New South Wales.

To provide appropriate base data layers different strategies will be required. Some data layers could be provided efficiently as a single consistent layer in one project whilst others could be developed on a region by region basis. Either method should use consistent standards.

Some of the base data layer projects require extensive fieldwork. Economies of scale would be achieved if, for example, flora and fauna surveys were carried out together. Satellite imagery could be used to stratify areas that are to be sampled. Undertaking data collection at a regional level would allow these economies of scale to be achieved.

Once the base data layers have been completed, additional projects will be required to produce derived and modelled data layers.

Existing data related initiatives are described in appendix 10.

### 5.1.1 A CURRENT ADMINISTRATIVE AND TENURE LAYER

A current administrative layer will be required. Knowledge of land ownership is important to planning processes, and may influence the choice of management options.

The administrative layer should also include tenure information such as mining and exploration titles, Voluntary Conservation and Property Agreements, zoning information contained in statutory plans etc.

### 5.1.2 A DIGITAL ELEVATION MODEL

A digital elevation model of appropriate resolution and accuracy (minimum – 100m western division and 25m in central division) would enable useful terrain information to be generated such as slope, aspect and topographic position. This information could then be used in modelling and to produce derived data layers.

### **5.1.3 ABORIGINAL CULTURAL INFORMATION AT A LANDSCAPE LEVEL AND CULTURAL HERITAGE SITES**

Information about the Aboriginal landscapes of western New South Wales is required urgently. Much focus has been placed on archaeological relics and on site-specific importance, with relatively little analysis of the ways these features fit into the overall landscape.

Information could be captured through:

- Recording of oral histories with Aboriginal Elders. Information gathered from oral histories could be amalgamated with existing information to develop a data layer featuring areas of significance to Aboriginal people across western New South Wales. This information needs to be gathered as soon as possible.
- Landscape modelling of Aboriginal occupation, Aboriginal sites and Places of Significance.
- Targeted archaeological surveys and anthropological studies to validate the Aboriginal landscape modelling.

It will be necessary to consult with relevant Aboriginal communities to ensure a culturally appropriate process is undertaken.

### **5.1.4 A COMPREHENSIVE AND UNIFORM VEGETATION LAYER DERIVED FROM STRUCTURAL AND FLORISTIC DATA**

A consistent structural and floristic vegetation layer, both pre-clearing and existing need to be developed for western New South Wales.

Existing data such as the M305 have variable reliability and includes only vegetation with greater than 20% canopy cover for remnants greater than ten hectares. This is inadequate for western New South Wales, as it does not provide mapping for grasslands, herblands and shrublands.

An analysis of the reliability of the existing major vegetation maps, via quadrat based sampling, is also required.

### **5.1.5 SYSTEMATIC AND TARGETED SURVEYS OF FAUNA AND FLORA AND AUTECOLOGICAL STUDIES TO PROVIDE ADEQUATE INFORMATION FOR MODELLING THEIR DISTRIBUTION**

Models of fauna and flora distribution, based upon extensive survey and autecological work are required. Recent biodiversity surveys undertaken by the NSW National Parks and Wildlife Service have shown the value of systematic field surveys with a number of species being found for the first time or being rediscovered in New South Wales. These include the Western Pygmy-possum and the Southern Hairy-nosed Wombat. Targeted surveys for particular species may be required.

#### **5.1.6 UP-TO-DATE AND UNIFORM GEOLOGY, SOIL, METALLIC MINERALS OCCURRENCES, INDUSTRIAL MINERALS OCCURRENCES AND CONSTRUCTION MATERIALS OCCURRENCES**

An overview of the western region is considered important to identify mineral potential and other issues of geoscientific significance. Up-to-date and uniform digital coverages of geology, soil, metallic minerals occurrences, industrial minerals occurrences and construction materials occurrences are strongly needed.

To supplement these whole-of-region data sets, more detailed studies in selected areas are needed. These would include information from projects undertaken by the Department of Mineral Resources on regional geoscience, geochemistry, drill holes, airborne geophysical coverages by both government and industry, information on energy resources in specific sedimentary basins, information gathered from exploration for minerals and energy resources.

An important requirement in regional planning is systematic assessment of mineral potential. This assessment is based on the geoscience data sets described above but also requires further analysis, particularly of mineral deposit data. Mineral potential maps need to be supplemented by more specific studies in key areas, especially those of higher mineral potential, for any detailed land use assessments.

#### **5.1.7 CURRENT SATELLITE IMAGERY**

Current remote sensing information would be needed to implement some of the above recommendations.

#### **5.1.8 CURRENT AND HISTORICAL LAND USE, DISTURBANCE HISTORY, WOOD RESOURCE INFORMATION, GROUND AND SURFACE WATER QUALITY AND QUANTITY AND SALINITY AND FLOOD MAPPING.**

The above data layers were identified as being necessary from the workshop.

### **5.2 FUTURE SCOPING**

#### **5.2.1 SCOPING EXERCISES, AS PART OF THE APPROVED WESTERN REGIONAL ASSESSMENT STRATEGY, SHOULD BE CARRIED OUT TO IDENTIFY STAKEHOLDERS, ISSUES, STANDARD METHODS AND DATA LAYERS REQUIRED.**

Once the Western Regional Assessment Strategy has been finalised, it is recommended that additional consultation be undertaken to define Stakeholders and their data requirements.

The NSW Natural Resources Data Directory is well suited to obtaining the most up to date information on existing data in an area and should be used as part of the scoping exercise.

Any data collection should use standard methods. The Eastern Comprehensive Regional Assessments had agreed standard methodologies for data collection in forests. These are not necessarily applicable to data requirements in western New South Wales. There is a need for the development of agreed methods for the collection of different types of data for the Western Regional Assessment. Any project to be funded by the Resource and Conservation Assessment Council would then need to use these methods, so that the results can be used as widely as possible.

Such development of standards would need to include a review of existing standards and guidelines, consultation with various user groups to consider their requirements, peer review and then approval by the Resource and Conservation Assessment Council. The agreed standards would need to be distributed as widely as possible to encourage adoption in future collection processes.

## **5.3 DATA MANAGEMENT**

A number of data management issues became apparent during this project which will need to be addressed during the Western Regional Assessment. To ensure data is managed appropriately and readily available to stakeholders, the community and agencies the following recommendations have been made:

### **5.3.1 THAT A WESTERN REGIONAL ASSESSMENT DATA MANAGEMENT WORKING GROUP IS ESTABLISHED**

This group would consider data management issues, develop a Western Regional Assessment Data Management Manual and use as a reference the Natural Resources Information Management Strategy and Comprehensive Regional Assessment Data Management Manual.

The NSW Natural Resources Information Management Strategy is being developed by state government with representatives of all land and resource management agencies. Agencies include:

- |   |   |
|---|---|
| ■ Department of Land and Water Conservation | ■ Department of Mineral Resources         |
| ■ Department of Urban Affairs and Planning  | ■ Environmental Planning Authority        |
| ■ Land Information Centre                   | ■ NSW National Parks and Wildlife Service |
| ■ State Forests                             | ■   |

Many of the issues related to generic data management faced by government are being looked at by this strategy.

The Working Group will need to consider such issues as the:

a) Geocentric Datum of Australia, GDA94.

Australia currently uses the AGD66 datum. As Australia is changing to GDA94 on 1 Jan 2000, any data generated by the Western Regional Assessment will need to be in this datum. The difference between datum causes a displacement of locations by 200 metres in a NE direction. Existing data will also need to be converted prior to use. Currently there is no conversion program available to undertake this work reliably. The likely time and cost of this conversion could be significant.

b) Scale.

The scales that data are collected at and utilised are extremely important and vary according to the task at hand. For example the scale required for regional planning exercises will vary from that required for property management planning.

c) Data Transfer.

The way in which data is managed to maximise ease of access and consistency for users.

Other points generated from discussions at the Workshop include:

- data management principles / manual prepared
- data ownership, custodianship and transfer standards
- access to data not readily available
- value adding
- establish information needs of clients / users / Stakeholders
- ensure data is supplied in previously agreed format / standard
- communication of standards / access / new data available to other processes
- pricing policy
- metadata requirements
- many, many more

### **5.3.2 DATABASE ALL HERBARIA SPECIMENS AND INVESTIGATE LINKING THESE TO A SINGLE DATABASE**

It is recommended that information about all specimens in existing herbaria be entered into a single database. There is also a need to improve and standardise the quantity and quality of ecological information recorded with a specimen when collected. All information present on the specimen label needs to be entered into the database.

Investigation into linking all herbaria to a single database, possibly at the Royal Botanic Gardens is also required.

### **5.3.3 THAT FUTURE DATA COLLECTED BE ENTERED INTO THE RELEVANT DATABASE**

To improve the use and availability of information collected in New South Wales, all relevant data generated in the future should be entered into the appropriate digital database.

### **5.3.4 THAT EXISTING AND PROPOSED PROJECTS PROVIDE METADATA TO THE NSW NATURAL RESOURCES DATA DIRECTORY.**

To identify existing and future planning projects all relevant projects should provide metadata to the NSW Natural Resources Data Directory. Metadata would explain the nature of the project and would include information about any data produced by the project.

The keyword “PROJECT” will need to be added to the Australia and New Zealand Land Information Council standard for the NSW Natural Resources Data Directory.

The benefits of creating project metadata would include:

- alignment of projects with government strategies
- reduction in duplication
- efficiency in assessing the merit of proposed projects
- creation of a record of past projects, useable as a historic record

# 6. CONCLUSION

The recommendations of the Western Data Audit and Gap Analysis project, if implemented, could form the foundation for a comprehensive and integrated planning and management system for western New South Wales.

Some recommendations could be implemented in the near future with minimal expenditure, whilst others will require a commitment of significant resources.

In conclusion, substantial benefits to regional planning and the community would be realised by implementing the above recommendations. Such implementation will require thorough commitment from all relevant representatives.

# APPENDICES

## APPENDIX 1. METADATA

### Appendix 1a. Tenure.

**TITLE:**

Australia Land Tenure Data

**CUSTODIAN:**

Australian Surveying and Land Information Group (AUSLIG)

**JURISDICTION:**

Australia

**ABSTRACT:**

Contains boundary and attribute information for public and private land tenure, including Aboriginal & Torres Strait Islander land, for the whole of Australia. A nationally consistent, broadly based classification of land tenure has been used. Categories are Forestry Reserve; Aboriginal Freehold – national park; Marine Reserve; Nature Conservation Reserve; Water Reserve; Defence Land; Aboriginal Reserve; Other Crown Land; Mining Reserve; Vacant Crown Land; Mainly Freehold; Crown Leasehold (mainly pastoral); and Aboriginal Freehold & Leasehold.

**SEARCH WORDS:**

BOUNDARIES Mapping  
LAND Ownership Mapping  
LAND Use Mapping

**GEOGRAPHIC EXTENT NAME(S):**

Australia

**BEGINNING DATE:**

Not Known

**ENDING DATE:**

30JUN1993

**PROGRESS:**

Complete

**MAINTENANCE AND UPDATE FREQUENCY:**

Not Known

**STORED DATA FORMAT:**

DIGITAL, Vector Data  
NONDIGITAL, Maps

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**AVAILABLE FORMAT TYPE(S):**

DIGITAL – ARC/INFO

DIGITAL – AS2482

DIGITAL – GINA

DIGITAL – MapInfo

NONDIGITAL – Maps

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**ACCESS CONSTRAINTS:**

The data are subject to Commonwealth of Australia Copyright. A licence agreement is required for digital data and a licence fee is also applicable.

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**LINEAGE:**

The data were captured from 1:1 million scale maps.

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**POSITIONAL ACCURACY:**

Not Documented

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**ATTRIBUTE ACCURACY:**

Not Documented

---

**LOGICAL CONSISTENCY:**

Not Documented

---

**COMPLETENESS:**

Not Documented

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**CONTACT ORGANISATION:**

Australian Surveying and Land Information Group (AUSLIG)

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**CONTACT POSITION:**

Enquiries, Data/Map Sales, National Data Centre

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**CONTACT PERSON:**

Data/Map Sales Staff

---

**MAIL ADDRESS:**

PO Box 2

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**SUBURB OR PLACE OR LOCALITY:**

BELCONNEN

---

**STATE OR LOCALITY:**

ACT

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**COUNTRY:**

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[datasales@auslig.gov.au](mailto:datasales@auslig.gov.au)  
[mapsales@auslig.gov.au](mailto:mapsales@auslig.gov.au)

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**METADATA DATE:**

25NOV1996

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**ADDITIONAL METADATA:**

## Appendix 1b. Murray Darling Basin Structural Vegetation

| CATEGORY                  | CORE METADATA ELEMENT             | DESCRIPTION  |
|---------------------------|-----------------------------------|--|
| DATASET                   | Title:                            | M305 Structural Vegetation   |
|                           | Custodian:                        | NSW National Parks and Wildlife Service  |
| CONTACT ADDRESS           | Contact organisation:             | NSW NPWS, GIS Division   |
|                           | Contact position:                 | Manager, Spatial Systems Unit  |
|                           | Mail address:                     | PO Box 1967  |
|                           | Suburb/place/locality:            | HURSTVILLE   |
|                           | State:                            | NSW  |
|                           | Postcode:                         | 2220   |
|                           | Telephone:                        | (02) 9585 6695   |
|                           | Facsimile:                        | (02) 9585 6466   |
|                           | Electronic mail address:          | gis@npws.nsw.gov.au  |
|                           |                                   |  |
| DESCRIPTION               | Abstract:                         | Structural Vegetation mapping covering the NSW portion of the Murray Darling Basin. Mapped using visual interpretation of Landsat TM satellite imagery. Attribute mapping includes genus and species information. Scale of use = 1:100 000 |
|                           | Theme:                            | Vegetation   |
|                           | Keywords:                         | Landsat, Broadscale, Mapping, Floristics   |
|                           | Project:                          | Murray Darling Basin Commission M305 Project   |
|                           | Geographic extent:                | Murray Darling Basin in New South Wales  |
|                           | Bounding coordinates:             |  |
|                           | Type of feature:                  | Polygon  |
| DATASET CURRENCY          | Beginning date:                   | Interpreted from 1990/91 satellite imagery.  |
|                           | Ending date:                      | 1990/91  |
| DIGITAL DATA CAPTURE DATE | Beginning date:                   |  |
|                           | Ending date:                      |  |
| DATA SET STATUS           | Progress:                         | Version 1, September 1997  |
|                           | Maintenance and update frequency: | Unknown at this stage  |
| DATA SET ENVIRONMENT      | Software:                         | Arc/Info   |
|                           | Computer Operating System:        | UNIX   |
|                           | Location of Data:                 | ra workstation – Head Office GIS Division  |
|                           | Filename(s):                      | m305_z54, m305_z55   |
|                           | Dataset size:                     | 36Mb, 85Mb   |

|                           |  |  |
|---------------------------|--|--|
| <b>MAP SPECIFICATIONS</b> | <b>Number of maps:</b>                                 | All maps in MDB in NSW   |
|                           | <b>Map number(s) and name(s):</b>                      |  |
|                           | <b>Scale of source map(s)</b>                          | Satellite Imagery 1:100 000  |
|                           | <b>Location of original map(s):</b>                    | Images and overlays – GIS Division NPWS  |
|                           | <b>Mapped by:</b>                                      | Contractors  |
|                           | <b>Map(s) Digitised by:</b>                            | Scanned by Land Information Centre, NSW Agriculture and State Forests of NSW   |
| <b>ACCESS</b>             | <b>Available format types:</b>                         | <b>Digital Data</b> – Arc/Info coverage, export file or shape file; DXF format; Ungenerated format   |
|                           | <b>Available format forms:</b>                         | CD-ROM, Exabyte tape   |
|                           | <b>Access constraints:</b>                             | The dataset is available to all organisations and individuals. A licence agreement is required to obtain the dataset. A fee may be charged to consultants, commercial organisations and local councils.<br>This is to cover the cost of transfer of the data, not for the data itself  |
|                           | <b>Use constraints:</b>                                | The data must not be transferred, distributed, sold, released or sub-licensed to a third party. The data must be used only for the purposes stated in the licence, and must not be altered, corrected, amended or reproduced without a written consent from the Service. Maps and reports made from the data must acknowledge the source and the date the data was released. |
| <b>DATA QUALITY</b>       | <b>Lineage:</b>  | Linework derived by visual interpretation of hardcopy Landsat TM imagery printed at 1:100 000. Polygon's attributed by combination of visual interpretation and low intensity field work. Linework scanned, attributes then added manually. Mapsheets edgematched in ARC/INFO and attribute tables combined (both by LIC) to produce single basin wide attribute table.      |
|                           | <b>Positional accuracy:</b>                            | No formal accuracy assessment has been carried out. See NPWS report "Murray Darling Basin Project M305: Methodology for Mapping Structural Vegetation August 1997".  |
|                           | <b>Attribute accuracy:</b>                             | No formal accuracy assessment has been carried out. See NPWS report "Murray Darling Basin Project M305: Methodology for Mapping Structural Vegetation August 1997".  |
|                           | <b>Logical consistency:</b><br><br><b>Completeness</b> | The dataset has ARC/INFO polygon topology, all polygons are labelled.<br>The dataset is complete for the NSW portion of the Murray Darling Basin, to the specifications detailed in  |

|                              |                                    |  |
|------------------------------|------------------------------------|--|
|                              |                                    | Ritman, K.T. (1995). Structural Vegetation Data: a specifications manual for the Murray Darling Basin Project M305. NSW Department of Land and Water Conservation, Land Information Centre, Bathurst |
| <b>NOTES</b>                 | <b>Notes:</b>                      |  |
| <b>METADATA DATE</b>         | <b>Metadata date:</b>              | 24/09/1997   |
| <b>METADATA COMPLETED BY</b> | <b>Metadata sheet compiled by:</b> | Paul Femons, Manager Spatial Systems Unit  |
| <b>FURTHER INFORMATION</b>   | <b>Further information:</b>        | NPWS report "Murray Darling Basin Project M305: Methodology for Mapping Structural Vegetation August 1997".  |

## **Appendix 1c. SPOT Multispectral**

### **TITLE:**

SPOT Multispectral (XS)

### **CUSTODIAN:**

Australian Surveying and Land Information Group (AUSLIG)

### **JURISDICTION:**

Australia

### **ABSTRACT:**

SPOT 1, launched in 1986 by the French Government agency, Centre National d'Etudes Spatiales, carries two High Resolution Visible (HRV) sensors. Two SPOT satellites (SPOT 2 & 3) currently orbit the earth 180 degrees apart with SPOT 2 being the nominally operational satellite but data from SPOT 3 can be acquired on request.

Each HRV has a ground swath 60 kilometres wide, and can operate independently either in panchromatic (PA) or multispectral (XS) mode. SPOT 3 carries the only operational onboard tape recorders which store imagery when the sensors are operating outside the reception area of a ground station, allowing worldwide coverage by SPOT. Every 26 days, SPOT's orbit can provide total coverage of the Earth's surface, in a vertical viewing mode. Additionally, SPOT has the ability to image up to an angle of 27 degrees east or west of vertical. This can allow revisits of the same site in Australia in as little as three days, and also allows for stereo images to be acquired for use in determining the height of ground features. The archive of ACRES products includes SPOT data from 1989 onwards.

The HRV multispectral (XS) sensor operates in three bands in the visible and near infrared part of the electromagnetic spectrum with a resolution of 20m.

ACRES SPOT archive contains selected imagery from the following SPOT satellites:

SPOT 1 commenced 1 January 1990, ceased January 91.

SPOT 2 commenced 1 January 1991, continuing.

SPOT 3 selected from 25 September 1993.

### **SEARCH WORDS:**

PHOTOGRAPHY AND IMAGERY

PHOTOGRAPHY AND IMAGERY Remote Sensing

PHOTOGRAPHY AND IMAGERY Satellite

### **GEOGRAPHIC EXTENT NAME(S):**

Australia including external territories

New Zealand

### **BEGINNING DATE:**

01JAN1990

### **ENDING DATE:**

Current

### **PROGRESS:**

In Progress

### **MAINTENANCE AND UPDATE FREQUENCY:**

As Required

### **STORED DATA FORMAT:**

DIGITAL Archive Format

**AVAILABLE FORMAT TYPE(S):**

DIGITAL Satellite Imagery

**ACCESS CONSTRAINTS:**

Payment and Licence Agreement

**LINEAGE:**

The SPOT XS data set is acquired by earth orbiting remote sensing satellites. These satellites carry two types of sensor systems known as “active” and “passive”. A “passive” system generally consists of an array of small sensors or detectors which record (as digital numbers) the amount of electro-magnetic radiation reflected and/or emitted from the Earth’s surface. The SPOT XS is a passive system. The digital data acquired by the satellites are transmitted to ground stations and can be used to reconstitute an image of the Earth’s surface not too dissimilar to an aerial photograph.

Data are received through the ACRES antenna at the Data Acquisition Facility at Alice Springs enabling coverage of the Australian landmass. The recorded data are air-freighted daily to the Data Processing Facility in Canberra where it is catalogued and archived.

Data are recorded and archived by path, or swath, allowing coverage of any region in the path to be extracted by its geographical coordinates. If the region of interest extends across two adjacent paths the appropriate data set from each path will need to be extracted. Because of the orbital parameters of the satellite, adjacent paths are not acquired sequentially and information from each path may differ according to the time delay between the two passes.

To assist cataloguing and ordering, a path is segmented into individual scenes the length of each scene being the same as the path width. Each scene can be related to geographical coordinates using the Path/Row reference system. The Path is the number of the satellite swath (east to west) across Australia and the Row is the number of the scene south of the equator. Diagrams and formulae are available to assist in relating geographical coordinates to the satellite scene Path/Row coordinates.

Each scene acquired by ACRES is sub-sampled and produced in its Digital Catalogue access to which is available through the WWW.

Data are provided as hard copy photographic data products, or as digital data products which can be viewed and manipulated on a variety of software systems. However, the data transmitted to Earth from an Earth observation satellite are in a form unsuitable for use by customers so ACRES processes this raw data in varying degrees to produce products suitable for use by clients. ACRES only processes the data after a client has placed an order for a specific product. This is due to the large quantities of data received from a satellite and the large range of product options available.

**POSITIONAL ACCURACY:**

Within 3km to within 60m, or better, after specialised processing.

**ATTRIBUTE ACCURACY:**

Not Applicable

**LOGICAL CONSISTENCY:**

As the data is acquired in seamless north-south paths (swaths) each path is internally consistent. However, paths are acquired on different dates and while paths can be joined to cover larger areas, changes in ground conditions between acquisition dates may be apparent in the resulting mosaic.

**COMPLETENESS:**

Coverage is acquired on an “as required” basis and while national coverage may be extracted from the archive the acquisition dates may range over a year or more.

**CONTACT ORGANISATION:**

Australian Surveying and Land Information Group (AUSLIG)

Australian Centre for Remote Sensing (ACRES)

**CONTACT POSITION:**

Direct Client Account Manager

**CONTACT PERSON:**

Mr John Lee

**MAIL ADDRESS:**

PO Box 2

**SUBURB OR PLACE OR LOCALITY:**

BELCONNEN

**STATE OR LOCALITY:**

ACT

**COUNTRY:**

Australia

**POSTCODE:**

2616

**TELEPHONE:**

Australia Fixed Network number

61 2 6201 4131

Australia Freecall

1800 800 173

**FACSIMILE:**

Australia Fixed Network number

61 2 6201 4366

**ELECTRONIC MAIL ADDRESS:**

ACRES

**METADATA DATE:**

04SEP1998

**ADDITIONAL METADATA:**

Also, further information about Spatial Metadata is at ANZLIC

**LIST OF ATTRIBUTES:**

Nil

**SCALE/RESOLUTION:**

20 metre pixel resolution

**SCIENTIFIC AND TECHNICAL LIMITATIONS:**

The data may be limited by its pixel resolution and scene extents.

**SIZE OF THE DATASET:**

A full scene is approximately 27Mb

**PRICE AND ASSOCIATED ACCESS CONSTRAINTS:**

Full Scene, Path Oriented, System Corrected is \$1700

Map Oriented, System Corrected, Variable Window Up to 13 000 sq km is \$3000

Map Oriented, Precision Corrected, Variable Window Up to 13 000 sq km is \$3680

Map Oriented, Ortho-Corrected, Variable Window Up to 13 000 sq km is \$3790

Scenes may also be purchased with differing band combinations and smaller variable windows.

The lowest priced product is a 225 sqkm (15 x 15 km), Map Oriented, Precision Corrected, Variable Window for \$495.

Special copyright conditions apply to the sale of satellite data. To acknowledge these copyright conditions, customers are required to sign a Satellite Data Licence Conditions prior to the purchase of any data.



# Appendix 1d. Eastern Bushland Database

| CATEGORY                  | CORE METADATA ELEMENT             | DESCRIPTION  |
|---------------------------|-----------------------------------|--|
| DATASET                   | Title:                            | Eastern Bushlands Database   |
|                           | Custodian:                        | NSW National Parks and Wildlife Service  |
| CONTACT ADDRESS           | Contact organisation:             | NSW NPWS, GIS Division   |
|                           | Contact position:                 | Manager, Spatial Systems Unit  |
|                           | Mail address:                     | PO Box 1967  |
|                           | Suburb/place/locality:            | HURSTVILLE   |
|                           | State:                            | NSW  |
|                           | Postcode:                         | 2220   |
|                           | Telephone:                        | (02) 9585 6695   |
|                           | Facsimile:                        | (02) 9585 6466   |
|                           | Electronic mail address:          | <a href="mailto:gis@npws.nsw.gov.au">gis@npws.nsw.gov.au</a>   |
| DESCRIPTION               | Abstract:                         | Structural Vegetation mapping covering the eastern portion of NSW. Mapped using visual interpretation of Landsat TM satellite imagery. Attribute mapping includes structural vegetation information. Data should not be used at scales finer than 1:250 000. |
|                           | Theme:                            | Vegetation   |
|                           | Keywords:                         | Landsat, Broadscale, Structural  |
|                           | Project:                          | Eastern Bushlands Database   |
|                           | Geographic extent:                | Eastern NSW  |
|                           | Bounding coordinates:             |  |
|                           | Type of feature:                  | Polygon  |
| DATASET CURRENCY          | Beginning date:                   | Interpreted from 1989/90/91 satellite imagery.   |
|                           | Ending date:                      | 1990/91  |
| DIGITAL DATA CAPTURE DATE | Beginning date:                   |  |
|                           | Ending date:                      |  |
| DATASET STATUS            | Progress:                         | Final Version, September 1997  |
|                           | Maintenance and update frequency: | None Planned   |
| DATASET ENVIRONMENT       | Software:                         | Arc/Info   |
|                           | Computer Operating System:        | UNIX   |
|                           | Location of Data:                 | ra workstation – Head Office GIS Division  |

|                           |                                     |   |
|---------------------------|-------------------------------------|---|
| <b>MAP SPECIFICATIONS</b> | <b>Filename(s):</b>                 | EBD_Cent, EBD_Sth, EBD_Nth  |
|                           | <b>Dataset size:</b>                | 62Mb ,18Mb, 36Mb  |
|                           | <b>Number of maps:</b>              |   |
|                           | <b>Map number(s) and names</b>      |   |
|                           | <b>Scale of source map(s)</b>       | Satellite Imagery 1:100 000   |
|                           | <b>Location of original map(s):</b> | Images and overlays – GIS Division NPWS   |
|                           | <b>Mapped by:</b>                   | Contractors   |
| <b>ACCESS</b>             | <b>Map(s) Digitised by:</b>         | NPWS Regions and Districts  |
|                           | <b>Available format types:</b>      | <b>Digital Data</b> – Arc/Info coverage, export file or shape file; DXF format; Ungenerated format  |
|                           | <b>Available format forms:</b>      | CD-ROM, Exabyte tape  |
|                           | <b>Access constraints:</b>          | The dataset is available to all organisations and individuals. A licence agreement is required to obtain the dataset. A fee may be charged to consultants, commercial organisations and local councils.<br>This is to cover the cost of transfer of the data, not for the data itself   |
|                           | <b>Use constraints:</b>             | The data must not be transferred, distributed, sold, released or sub-licensed to a third party. The data must be used only for the purposes stated in the licence, and must not be altered, corrected, amended or reproduced without a written consent from the Service. Maps and reports made from the data must acknowledge the source and the date the data was released. Data should not be used at scales finer than 1:250 000.                                      |
| <b>DATA QUALITY</b>       | <b>Lineage:</b>                     | Data was captured as part of the Save the Bush funded Eastern Bushlands Database project. Linework derived by visual interpretation of hardcopy Landsat TM imagery printed at 1:100 000. Polygon's attributed by combination of visual interpretation and low intensity field work. Three separate datasets are similar but not enough to enable combining of them. Digitised in ERMS. Data then transferred into ARC/INFO. Three datasets stored and managed separately. |

|                              |                                    |  |
|------------------------------|------------------------------------|--|
|                              | <b>Positional accuracy:</b>        | Data should not be used at scales finer than 1:250 000. No formal accuracy assessment has been carried out. See following NPWS reports for details of methodology: "Holme, L. (1993). Eastern Bushlands Database Project (Central Region). NSW NPWS internal unpublished document" and "Roberts, G. (1992). Vegetation systems of north east New South Wales: Mapped from Landsat TM imagery. NSW National Parks and Wildlife Service NEP 91 298." |
|                              | <b>Attribute accuracy:</b>         | No formal accuracy assessment has been carried out. See above NPWS reports.  |
|                              | <b>Logical consistency:</b>        | The dataset has ARC/INFO polygon topology, all polygons are labelled.  |
|                              | <b>Completeness</b>                | The dataset consists of three complete portions covering eastern NSW – Northern, Southern and Central.   |
| <b>NOTES</b>                 | <b>Notes:</b>                      |  |
| <b>METADATA DATE</b>         | <b>Metadata date:</b>              | 24/09/1997   |
| <b>METADATA COMPLETED BY</b> | <b>Metadata sheet compiled by:</b> | Paul Femons, Manager Spatial Systems Unit  |
| <b>FURTHER INFORMATION</b>   | <b>Further information:</b>        | "Holme, L. (1993). Eastern Bushlands Database Project (Central Region). NSW NPWS unpublished", "Roberts, G. (1992). Vegetation systems of north east New South Wales: Mapped from Landsat TM imagery. NSW National Parks and Wildlife Service NEP 91 298."   |

## Appendix 1e. Vegetation Mapping of the NSW Wheat-belt

| METADATA CATEGORY         | CORE METADATA ELEMENT            | DESCRIPTION   |
|---------------------------|----------------------------------|---|
| DATASET                   | Title                            | Native Remnant Vegetation Mapping of the NSW Wheat-belt   |
|                           | Custodian                        | National Parks & Wildlife, NSW  |
| CONTACT ADDRESS           | Contact organisation             | National Parks & Wildlife, NSW  |
|                           | Contact position                 | Manager GIS Division  |
|                           | Mail address                     | P.O. Box 1967   |
|                           | Suburb/Place/Locality            | Hurstville  |
|                           | State                            | NSW   |
|                           | Postcode                         | 2220  |
|                           | Telephone                        | 02 585 6444   |
|                           | Facsimile                        | 02 585 6555   |
|                           | Electronic mail address          | <a href="mailto:gis@npws.nsw.gov.au">gis@npws.nsw.gov.au</a>  |
|                           |                                  |   |
| DESCRIPTION               | Abstract                         | Native woody remnant vegetation boundaries delineated from aerial photographs of various ages transferred to 1:100 000 map sheets and digitised to produce vegetation maps for the wheat-belt of NSW.   |
|                           | Theme                            | Vegetation  |
|                           | Keywords                         | inventory mapping   |
|                           | Project                          | Wheat-belt vegetation mapping project.  |
|                           | Geographic extent                | The wheat-belt of NSW is defined as the plains west of the of southern and northern slopes of NSW and east of the Western Division Boundary and extending from the Queensland border to 33 degrees South. Primarily located in the Central Division of NSW. |
|                           | Bounding coordinates             | nw 146' 30" 29' 30"<br>ne150' 30" 29' 30"<br>se148' 30" 33'<br>sw146' 30" 33'   |
|                           | Type of feature                  | polygon digitised data converted to grid cell data  |
| DATASET CURRENCY          | Beginning date                   | 1978  |
|                           | Ending date                      | 1994  |
| DIGITAL DATA CAPTURE DATE | Beginning date                   | 20/04/91  |
|                           | Ending date                      | current   |
| DATASET STATUS            | Progress                         | In progress   |
|                           | Maintenance and update frequency | As required   |
| DATASET ENVIRONMENT       | Software                         | Digitised using Environmental Resource Mapping System (E-RMS) (Version various), Arc/Info   |

|                           |                                    |  |
|---------------------------|------------------------------------|--|
|                           | <b>Computer Operating system</b>   | DOS,UNIX   |
|                           | <b>Location of data</b>            | Network at Head Office Network & on disk with Dominic Sivertsen ESR Division   |
|                           | <b>Filename</b>                    | M:\applics\ermsmaps\state\twofifty\subdirectories for each 1: 250 000 map sheet listed above   |
|                           | <b>Dataset size</b>                |  |
| <b>MAP SPECIFICATIONS</b> | <b>Number of maps:</b>             | 16 1:250 000   |
|                           | <b>Map number(s) and name(s)</b>   | St George SH/55-4 Goondiwindi SH/56-1 Angeldool SH/55-7 Moree SH/55-8 Inverell SH/56-5 Bourke, Walgett, Narrabri SH/55-10 to 12 Cobar, Nyngan, Gilgandra SH/55-14 to 16 Nymagee, Narromine, Dubbo SI/55-2 to 4 Cargelligo SI/55-6 Forbes SI/55-7 |
|                           | <b>Scale of source maps(s)</b>     | 57 maps at 1:100 000   |
|                           | <b>Location of original map(s)</b> | NPWS NSW, Head Office, Environmental Survey & Research Division, Dominic Sivertsen   |
|                           | <b>Mapped by</b>                   | Dominic Sivertsen NPWS, NSW  |
|                           | <b>Map digitised by</b>            | Jessica Scott, Ian Radford, Ian Geers, Stephen Cox, Tracey Anderson, Lisa Metcalfe.  |
|                           |                                    |  |
| <b>ACCESS</b>             | <b>Available format types</b>      | Hardcopy and Digital ASCII some hard copy printed maps and reports. Arc/Info export  |
|                           | <b>Available format forms</b>      | Exabyte tape, CD-ROM, 3.5" Floppy Disk   |
|                           | <b>Access constraints</b>          | Data not to be released without consultation with Dominic Sivertsen.   |
|                           | <b>Use constraints</b>             | A licence agreement is required to obtain the dataset. A fee may be charged to consultants, commercial organisations and local councils.   |
| <b>DATA QUALITY</b>       | <b>Lineage</b>                     | Aerial photographs at the 1:50 000 scale were used to define boundaries of remnant native vegetation. These boundaries were transferred to 1:100 000 scale maps and digitised using E-RMS.   |
|                           | <b>Positional accuracy</b>         | Digital data accurate to 20m. Consistent with cultural (roads) and physical (rivers & dams) attributes at the 1:100 000 map scale.   |
|                           | <b>Attribute accuracy</b>          | Very high degree of accuracy at the 1:250 000 scale. Based on extensive ground truthing at the 1:100 000 scale, objective classification using PATN on 1200 sites and Air photo interpretation.  |
|                           | <b>Logical consistency</b>         |  |
|                           | <b>Completeness</b>                | Vegetation types assigned within the survey boundary of the specified 1:250 000 maps. Extensive ground-truthing and accuracy assessment from Landsat and on ground reconnaissance.   |

|                                   |                                   |               |
|-----------------------------------|-----------------------------------|---------------|
| <b>NOTES</b>                      | <b>Notes</b>                      |               |
| <b>METADATA DATE</b>              | <b>Metadata date</b>              | Mar-96        |
| <b>METADATA SHEET COMPILED BY</b> | <b>Metadata sheet compiled by</b> | Lisa Metcalfe |
| <b>FURTHER INFORMATION</b>        | <b>Further information</b>        | nil           |

Appendix 1f. Atlas of NSW Wildlife

| CATEGORY            | CORE METADATA ELEMENT             | DESCRIPTION   |
|---------------------|-----------------------------------|---|
| DATASET             | Title:                            | Atlas of NSW Wildlife   |
|                     | Custodian:                        | NSW NPWS  |
| CONTACT ADDRESS     | Jurisdiction:                     | New South Wales   |
|                     | CRA Project Name:                 |   |
|                     | CRA Project Number:               |   |
|                     | Contact organisation:             | NSW NPWS  |
|                     | Contact position:                 | Manager, Wildlife Data Unit   |
|                     | Mail address 1:                   | GIS Division  |
|                     | Mail Address 2:                   | PO Box 1967   |
|                     | Suburb/place/locality:            | Hurstville  |
|                     | State/Locality 2:                 | NSW   |
|                     | Country:                          | Australia   |
|                     | Postcode:                         | 2220  |
|                     | Telephone:                        | 02 9585 6694  |
|                     | Facsimile:                        | 02 9585 6466  |
|                     | Electronic mail address:          | <a href="mailto:gis@npws.nsw.gov.au">gis@npws.nsw.gov.au</a>  |
| DESCRIPTION         | Abstract:                         | The Atlas of NSW Wildlife is a database containing fauna and flora records, including threatened species, for NSW. It is chiefly based on incidental sightings, but now contains a section, the BSS, that allows the storage of systematic survey data. |
|                     | Search Words:                     | Atlas; Fauna; Flora; Database   |
|                     | Geographic extent, Name(s):       | New South Wales, including Lord Howe Island and surrounding waters  |
|                     | Geographic Extent, Polygon(s):    |   |
|                     | Type of feature:                  |   |
|                     | Attribute/Field List:             |   |
|                     | Attribute/Field Description:      |   |
|                     | Scale/Resolution:                 |   |
| DATASET CURRENCY    | Beginning date:                   | Ongoing (allowing the collection of historical data). Current system established 1996.  |
|                     | Ending date:                      | Ongoing   |
| DATASET STATUS      | Progress:                         | Ongoing   |
|                     | Maintenance and update frequency: | Daily   |
| DATASET ENVIRONMENT | Software:                         | Sybase database, with Powerbuilder GUI  |
|                     | Computer Operating System:        | Database stored on UNIX, with connection via LAN/WAN to individual PC's running Windows 3.11 or Windows NT.   |

|                              |                                    |   |
|------------------------------|------------------------------------|---|
|                              | <b>Dataset Size:</b>               | 650000 records, plus licensed datasets  |
| <b>ACCESS</b>                | <b>Stored Data Format:</b>         | Standard reports designed within Atlas, ad hoc reporting through the use of InfoMaker.  |
|                              | <b>Available Format Type:</b>      | Reports can be printed or exported as delimited files. These can then be imported into GIS applications or manipulated in spreadsheets such as Excel.   |
|                              | <b>Access constraints:</b>         | Within NPWS access is unrestricted. Species lists available free and with no licence conditions. Other report types subject to data licence agreement, may incur a cost, and usually have grid references denatured to the nearest kilometre. |
| <b>DATA QUALITY</b>          | <b>Lineage:</b>                    | Species records are submitted as incidental sightings or systematic surveys and entered into the database. Species records are also imported from existing databases.   |
|                              | <b>Positional accuracy:</b>        | Location details validated on entry, based on grid references supplied. Accuracy index of location applied.   |
|                              | <b>Attribute accuracy:</b>         | All records are automatically assigned a reliability, based on the observers experience. Unusual sightings that fail validations are queried and further validation may occur.  |
|                              | <b>Logical consistency:</b>        | Records can not be saved if compulsory fields are missing. Other fields have validations that either prevent saving or place records in Quarantine Area.  |
|                              | <b>Completeness:</b>               | Can never be complete.  |
| <b>NOTES</b>                 | <b>Notes:</b>                      | More detailed information on use of the Atlas can be obtained from the Atlas of NSW Wildlife User's Manual.   |
| <b>METADATA DATE</b>         | <b>Metadata date:</b>              | 17/05/1998  |
| <b>METADATA COMPLETED BY</b> | <b>Metadata sheet compiled by:</b> | Peter Ewin, Manager Wildlife Data Unit  |
| <b>FURTHER INFORMATION</b>   | <b>Further information:</b>        | Wildlife Data Unit, GIS Division  |



Call for public contributions to the  
Atlas of New South Wales Wildlife.

The NSW National Parks and Wildlife Service (NPWS) is undertaking an audit of natural resource data collected from western New South Wales in an attempt to comprehensively update the Atlas of NSW Wildlife. This will contribute to the body of available flora and fauna information and will greatly assist in future conservation and land management in western New South Wales.

We are inviting state and local governments, educational institutions, community groups and individuals to contribute any flora or fauna related information to this Atlas. Such information could include field notebooks, unpublished reports or species lists. Of particular interest to the NPWS are site specific botanical or fauna species records (preferably in digital format or if unavailable, as maps or descriptive data) west of the Great Dividing Range

If you wish to provide information or would like to discuss any details of the audit, please contact, by 19 March 1999:

|  |                    |
|--|--------------------|
| David Coote  | Ph: (02) 6883 5303 |
| E-mail: <a href="mailto:david.coote@npws.nsw.gov.au">david.coote@npws.nsw.gov.au</a> | Fx: (02) 6884 9382 |

### **APPENDIX 3. SEARCHABLE LITERATURE DATABASES**

- **AGRICOLA** - UK agriculture specialisation
- **APAIS - AUSTRALIAN PUBLIC AFFAIRS INFORMATION SERVICE** - Australian National Library index to current affairs including conference papers and government policy.
- **BIOSIS** - Biological Abstracts online - English language - medical and veterinary emphasis but broad coverage of the natural sciences.
- **CURRENT CONTENTS - AGRICULTURE, BIOLOGY, ENVIRONMENTAL SCIENCES** - English language - broad coverage of natural sciences.
- **DIGITAL DISSERTATIONS** – English language – index to postgraduate theses.
- **ENDANGER** - Australian database of threatened species references - includes book chapters and non-refereed papers.
- **GEOBASE** - English language - Elsevier production - geological specialisation but broad coverage of natural sciences.
- **HERA** - Australian Heritage Commission database - Australian natural and cultural heritage coverage.
- **MEDGE** - English language index to management journals
- **NATIONAL BIBLIOGRAPHIC DATABASE** - Australian National Library database of Australian published works. Does not include index to journal articles or unpublished documents such as theses.
- **SOILCD** - English language index of soil conservation/ land management specialisation
- **STREAMLINE** - CSIRO index to journals and conferences in natural resources particularly land and water.
- **WILSON BIOLOGICAL AND AGRICULTURAL INDEX** - English language index to journals in biological sciences including land management and ecology
- **ZOOLOGICAL RECORD ONLINE** - English language index to journals in zoological sciences - covers amateur ornithological journals.

**APPENDIX 4. ANZLIC METADATA STANDARD PROFORMA**

| <b>METADATA CATEGORY</b> | <b>CORE METADATA ELEMENT</b>            | <b>DESCRIPTION</b>  |
|--------------------------|---|---|
| <b>DATA SET</b>          | <b>Title</b>                            | The name of the data set.   |
|                          | <b>Custodian</b>                        | The primary organisation associated with the data set and responsible for its maintenance.  |
|                          | <b>Jurisdiction</b>                     | The State or Country of the custodian   |
| <b>DESCRIPTION</b>       | <b>Abstract</b>                         | A characterisation of the data set, including a brief summary and the intentions with which the data set was developed.   |
|                          | <b>Search Word(s)</b>                   | A common use word or phrase used to describe the data set, chosen from a predefined list.   |
|                          | <b>Geographic Extent Name(s)</b>        | A picklist of pre-defined geographic extents, such as map sheets, local government areas, catchments, CRA regions, that reasonably indicate the spatial coverage of the data set.   |
|                          | <b>Geographic Extent Polygon(s)</b>     | An alternative way of describing geographic extent if no pre-defined area is satisfactory. Defined as a series of coordinate pairs that define the area(s) covered by the data set. |
| <b>DATA CURRENCY</b>     | <b>Beginning date</b>                   | The earliest date from which information contained in the data set is current.  |
|                          | <b>Ending date</b>                      | The latest date to which the information in the data set is current.  |
| <b>DATA SET STATUS</b>   | <b>Progress</b>                         | Progress status of the data set eg. Complete, in progress etc   |
|                          | <b>Maintenance and update frequency</b> | The frequency of changes and additions made to the data set after initial completion.   |
| <b>ACCESS</b>            | <b>Stored Data Format</b>               | A description of the format in which the data is stored.  |
|                          | <b>Available format types</b>           | A description of any format types both digital and non-digital in which the data set is available.  |
|                          | <b>Access constraints</b>               | Any special restrictions or limitations on obtaining the data set, and any restrictions or legal prerequisites for using the data set.  |

| <b>METADATA CATEGORY</b> | <b>CORE METADATA ELEMENT</b>             | <b>DESCRIPTION</b>  |
|--------------------------|--|---|
| <b>DATA QUALITY</b>      | <b>Lineage</b>                           | Information about events, parameters and source data which constructed the data set, and information about the responsible parties. |
|                          | <b>Positional accuracy</b>               | An assessment of the accuracy of the positions of spatial objects in the data set.  |
|                          | <b>Attribute accuracy</b>                | An assessment of the accuracy of the identification of entities and the assignment of attribute values in the data set.             |
|                          | <b>Logical consistency</b>               | An explanation of the fidelity or consistency of relationships in the data sets and the checking methods used.                      |
|                          | <b>Completeness</b>                      | Information about omissions, selection criteria, generalisations, definitions used and other rules used to derive the data set.     |
| <b>CONTACT ADDRESS</b>   | <b>Contact organisation</b>              | The name of the organisation with which contact may be made to enquire further about the data set.                                  |
|                          | <b>Contact Organisation Jurisdiction</b> | The State or Country of the contact organisation  |
|                          | <b>Contact position</b>                  | The position title of the individual within the organisation who is responsible for answering questions about the data set.         |
|                          | <b>Mail Address 1</b>                    | The mailing address of the contact position.  |
|                          | <b>Mail Address 2</b>                    | Optional extension of mail address 1  |
|                          | <b>Suburb/Place/Locality</b>             | The suburb, place or locality of the mailing address.   |
|                          | <b>State/Locality 2</b>                  | State of mail address.  |
|                          | <b>Country</b>                           | Country of the mailing address.   |
|                          | <b>Postcode</b>                          | The postcode of the mailing address.  |
|                          | <b>Telephone</b>                         | The telephone number of the contact position.   |
|                          | <b>Facsimile</b>                         | The fax number of the contact position.   |
|                          | <b>Electronic mail address</b>           | The electronic mailbox address of the contact position or organisation.   |

| <b>METADATA CATEGORY</b>              | <b>CORE METADATA ELEMENT</b>        | <b>DESCRIPTION</b>  |
|---------------------------------------|-------------------------------------|---|
| <b>ADDITIONAL METADATA and DATE</b>   | <b>Metadata date</b>                | The date that the metadata were created or last updated.  |
|                                       | <b>Additional Metadata</b>          | This section should include:<br>i) the name(s) of the author(s) of the metadata sheet;<br>ii) a description of the full directory pathway to the data;<br>iii) an indication of where additional metadata about the data set may be accessible eg. The name of any other directory system(s) where more detailed metadata are recorded; and<br>iv) any other information the author wishes to communicate to users which is not covered by the other proforma fields. |
| <b>CRA / RFA PAGE ONE INFORMATION</b> | <b>*CRA Project Name</b>            | The name of the approved CRA project for which the data has been created  |
|                                       | <b>*CRA Project Number</b>          | The number assigned to the approved CRA project   |
| <b>EXTENDED DESCRIPTION DETAILS</b>   | <b>*Type of feature</b>             | The type of feature held in the data set eg. Point locality records, grid cell, vector or polygon data.   |
|                                       | <b>*Attribute/Field List</b>        | A list of the attribute codes or names of the data set.   |
|                                       | <b>*Attribute/Field Description</b> | A description of the attribute codes or names for the data set  |
|                                       | <b>*Scale/Resolution</b>            | The scale or resolution at which the data set has been captured or derived  |
| <b>DATA SET ENVIRONMENT</b>           | <b>*Software</b>                    | The name and version of the software in which the data set has been developed/used  |
|                                       | <b>*Computer Operating System</b>   | Operating system in which the data has been developed/used.   |
|                                       | <b>*Data set Size</b>               | Size of data set  |

Fields denoted with an asterisk (\*) are additional to the ANZLIC Guidelines. (CRA Data Manual)

**WORKSHOP SESSION**

**DATA REQUIREMENTS**

**1.00 PM – 3.00 PM**

**BACKGROUND:**

The project has identified the following list of base data layers to assist regional planning:

**A current administrative and tenure layer**

**A suitable digital elevation model**

**Aboriginal cultural information at a landscape level**

**Database all herbaria specimens and investigate linking these to a single database**

**A consistent structural and floristic existing vegetation layer**

**Systematic and targeted surveys of fauna and flora and autecological studies to provide adequate information for modelling their distribution**

**Current geology, soil and mineral potential layers**

**Current satellite imagery**

These base data layers are those necessary to generate other derived and important Western Regional Assessment data layers.

## **DATA REQUIREMENTS WORKSHOP QUESTIONS AND ISSUES**

1. DO YOU AGREE WITH THIS LIST?  
(Record comments and issues)
  
2. SHOULD OTHER BASE LAYERS BE ADDED TO THE LIST?  
(List and record reasons, comments and issues)
  
3. REVIEW BOTH LISTS (1 AND 2) AND IDENTIFY THE HIGHEST PRIORITY BASE DATA LAYERS.
  
4. HOW WOULD YOU USE THESE BASE LAYERS IN REGIONAL PLANNING.
  
5. WHAT ARE THE KEY DERIVED LAYERS FOR THE WRA?

## **WORKSHOP SESSION**

### **FUTURE SCOPING**

**1.00 PM – 3.00 PM**

#### **BACKGROUND:**

The Project recommends scoping exercises as part of the approved Western Regional Assessment Strategy. These should be carried out to identify stakeholders, issues, standard methods and data layers required.

#### **QUESTIONS AND ISSUES**

1. DO YOU AGREE WITH THIS RECOMENDATION?  
(Record comments and issues)
  
2. WHAT ISSUES SHOULD BE CONSIDERED AS PART OF A SCOPING PROJECT FOR OBTAINING INFORMATION FOR REGIONAL PLANNING PROCESSES?
  
3. DEVELOP STRATEGIES TO ADDRESS THESE ISSUES.



## **WORKSHOP SESSION**

### **DATA MANAGEMENT**

**1.00 PM – 3.00 PM**

#### **BACKGROUND:**

The project has recommended the following data management strategies:

That a Western Regional Assessments Data Management Working Group be established and that the group considers data management issues as suggested from this session. This could lead to the preparation of a Western Regional Assessment Data Management Manual, which should consider the NSW Natural Resource Information Management Strategy

**Future data collected be entered into the relevant database.**

**Projects, existing and proposed, provide metadata to the NSW Natural Resources Data Directory.**

**The NSW Natural Resources Data Directory continues to be updated during the Western Regional Assessment and becomes the system for all stakeholders and project managers to find out what information is available and who to contact to obtain the data.**

**DATA MANAGEMENT WORKSHOP**  
**QUESTIONS AND ISSUES**

1. DO YOU AGREE WITH THIS LIST OF RECOMMENDATIONS?  
(Record comments and issues)
  
2. SHOULD OTHER DATA MANAGEMENT RECOMMENDATIONS BE ADDED?  
(List and record reasons, comments and issues)
  
3. IDENTIFY THE MOST CRITICAL RECOMMENDATIONS FOR THE WESTERN REGIONAL ASSESSMENT.
  
4. DEVELOP STRATEGIES TO ADVANCE THE MOST CRITICAL RECOMMENDATIONS

## APPENDIX 6. DATA LAYERS

1. Good - coverage and quality across Western NSW
2. Reasonable - some gaps in coverage or some work required to improve data
3. Poor - some coverage of parts of Western NSW or of variable quality
4. Not available

# derived layer  
base layers in bold

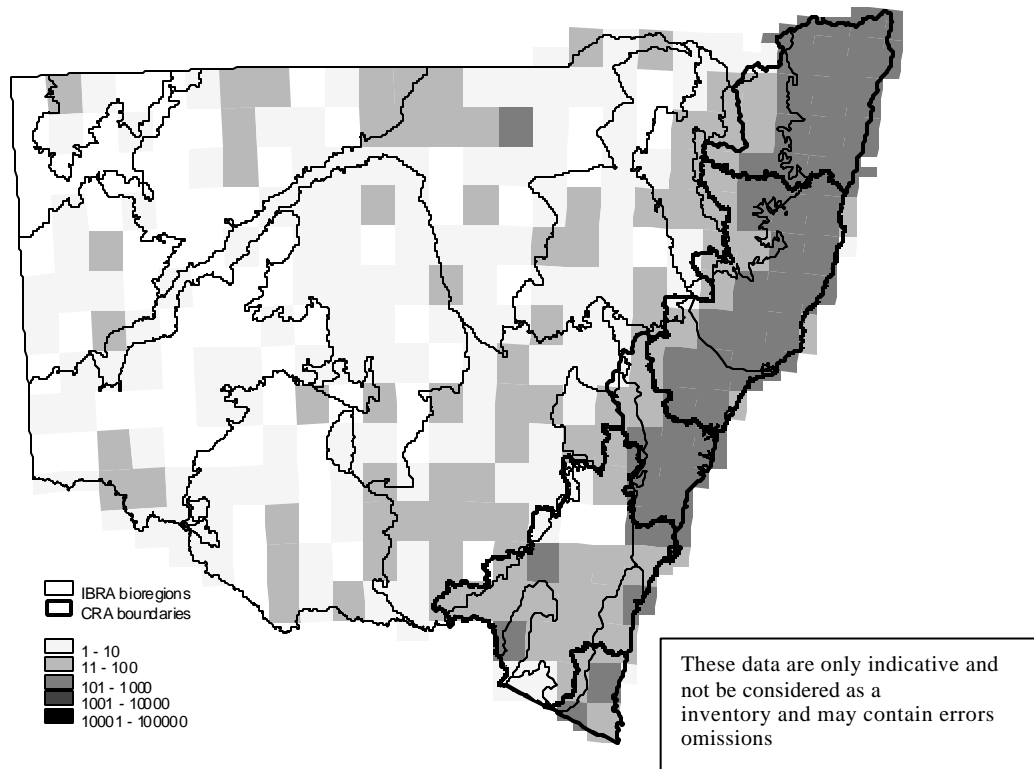
[illegible]

| Theme      | Data layer                                     | Western NSW | Darling Riverine Plain | Cobar Peneplain | Riverina | South Western Slopes | Nandewar | Brigalow Belt South | Mulga Lands | New England Tableland | Murray Darling Depression | Broken Hill Complex | Channel Country | Simpson Strezlecki Dunefields |
|------------|--|-------------|------------------------|-----------------|----------|----------------------|----------|---------------------|-------------|-----------------------|---------------------------|---------------------|-----------------|-------------------------------|
| GEOSCIENCE | <b>Geology</b>                                 | 2           | 3                      | 2               | 3        | 2                    | 2        | 3                   | 3           | 2                     | 3                         | 2                   | 3               | 3                             |
|            | Energy Resources                               | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | <b>Metallic Minerals Occurrences</b>           | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | <b>Industrial Minerals Occurrences</b>         | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | <b>Construction Materials Occurrences</b>      | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | Drill holes                                    | 4           | 4                      | 4               | 4        | 4                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 4                             |
|            | Geochemistry                                   | 3           | 3                      | 2               | 3        | 2                    | 3        | 3                   | 3           | 2                     | 3                         | 2                   | 3               | 3                             |
|            | Regional Geophysical Coverages                 | 2           | 2                      | 1               | 3        | 2                    | 2        | 3                   | 3           | 3                     | 3                         | 1                   | 3               | 3                             |
|            | Mineral Potential <sup>#</sup>                 | 4           | 4                      | 4               | 4        | 4                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 4                             |
|            | <b>Soil / Regolith / Superficial Lithology</b> | 3           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
| HERITAGE   | <b>Aboriginal Landscape</b>                    | 4           | 4                      | 4               | 4        | 3                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 4                             |
|            | Aboriginal Registered Sites                    | 3           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
|            | Register of the National Estate                | 2           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
|            | National Wilderness Index <sup>#</sup>         | 3           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | <b>Cultural Sites</b>                          | 3           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
|            |  |             |                        |                 |          |                      |          |                     |             |                       |                           |                     |                 |                               |
| LAND       | Digital Cadastre Database and CLID             | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | <b>Tenure</b>                                  | 3           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
|            | <b>Administration boundaries</b>               | 1           | 1                      | 1               | 1        | 1                    | 1        | 1                   | 1           | 1                     | 1                         | 1                   | 1               | 1                             |
|            | <b>Disturbance</b>                             | 3           | 3                      | 3               | 3        | 3                    | 3        | 3                   | 3           | 3                     | 3                         | 3                   | 3               | 3                             |
|            | Ecosystems <sup>#</sup>                        | 4           | 4                      | 4               | 4        | 4                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 2                             |
|            | Irreplaceability <sup>#</sup>                  | 4           | 4                      | 4               | 4        | 4                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 4                             |
|            | Land systems <sup>#</sup>                      | 3           | 1                      | 2               | ?        | 4                    | 4        | 4                   | 1           | 4                     | 1                         | 1                   | 1               | 1                             |
|            | Land capability <sup>#</sup>                   | 3           | 1                      | 2               | 1        | 1                    | 1        | 1                   | 4           | 1                     | 4                         | 4                   | 4               | 4                             |
|            | Landunits                                      | 3           | 1                      | 2               | ?        | 4                    | 4        | 4                   | 1           | 4                     | 1                         | 1                   | 1               | 1                             |
|            | <b>Landuse</b>                                 | 2           | 2                      | 2               | 2        | 2                    | 2        | 2                   | 2           | 2                     | 2                         | 2                   | 2               | 2                             |
|            | Salinity                                       | 3           | 3                      | 3               | 2        | 3                    | 3        | 3                   | 3           | 3                     | 2                         | 3                   | 3               | 3                             |
|            | Vulnerability <sup>#</sup>                     | 4           | 4                      | 4               | 4        | 4                    | 4        | 4                   | 4           | 4                     | 4                         | 4                   | 4               | 4                             |
|            | <b>Digital Elevation Model</b>                 | 3           | 2                      | 3               | 2        | 1                    | 1        | 3                   | 3           | 1                     | 3                         | 3                   | 3               | 4                             |

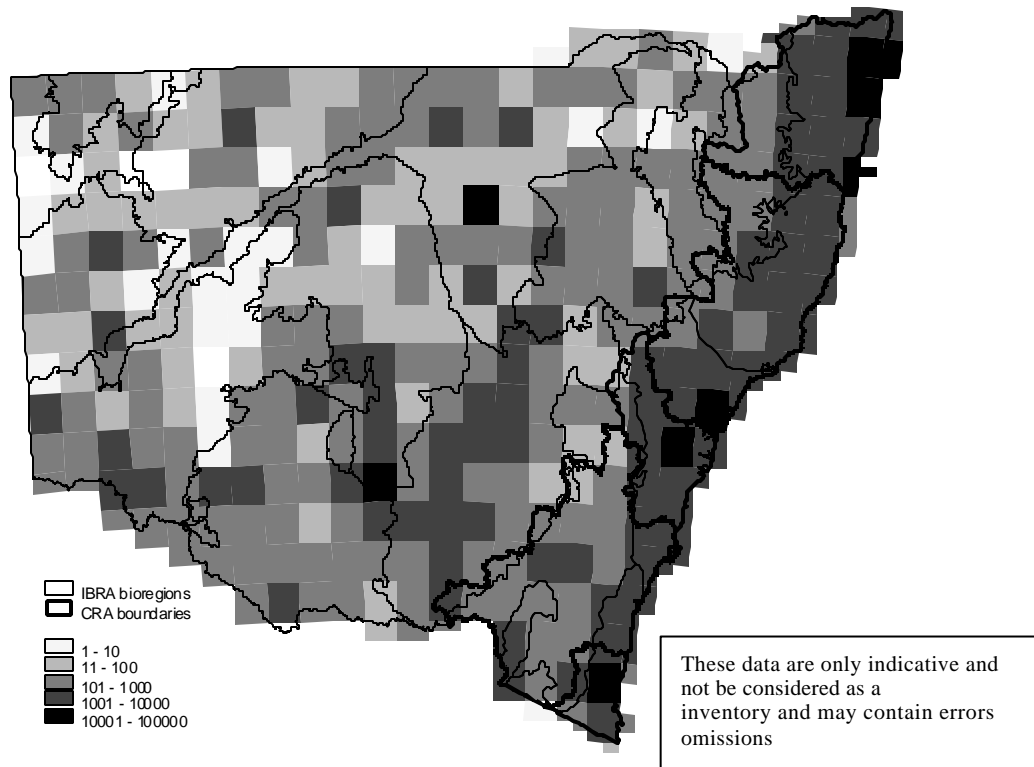
[illegible]

## APPENDIX 7. FAUNA SIGHTINGS BY CLASS

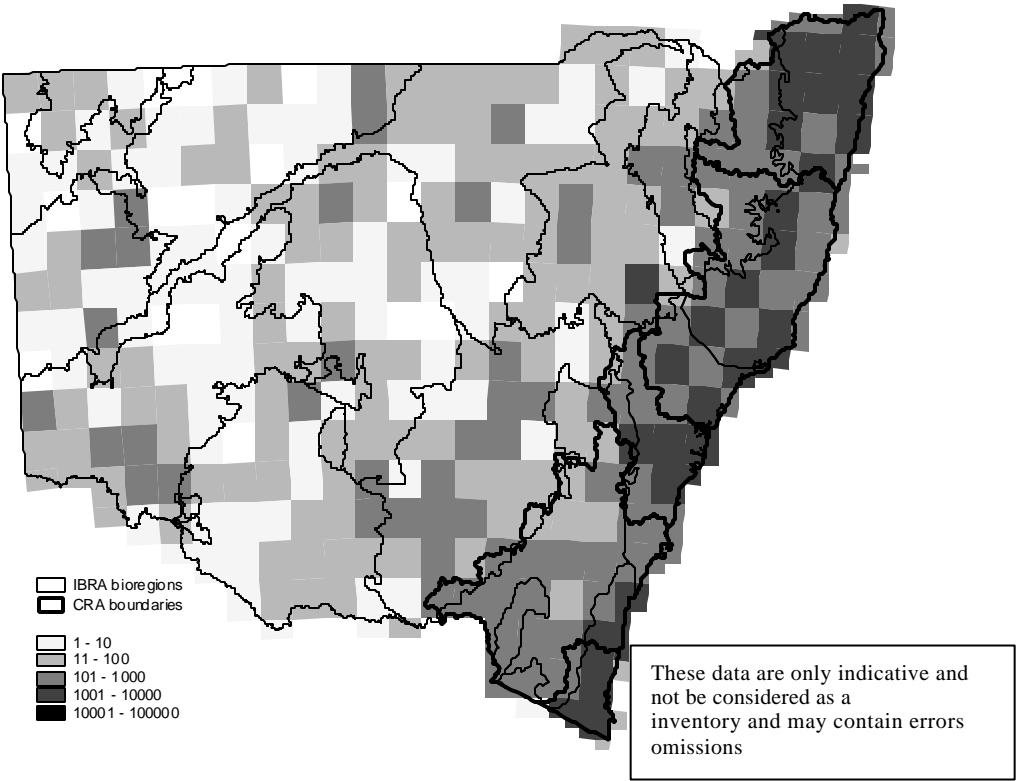
### Appendix 7a. Amphibians



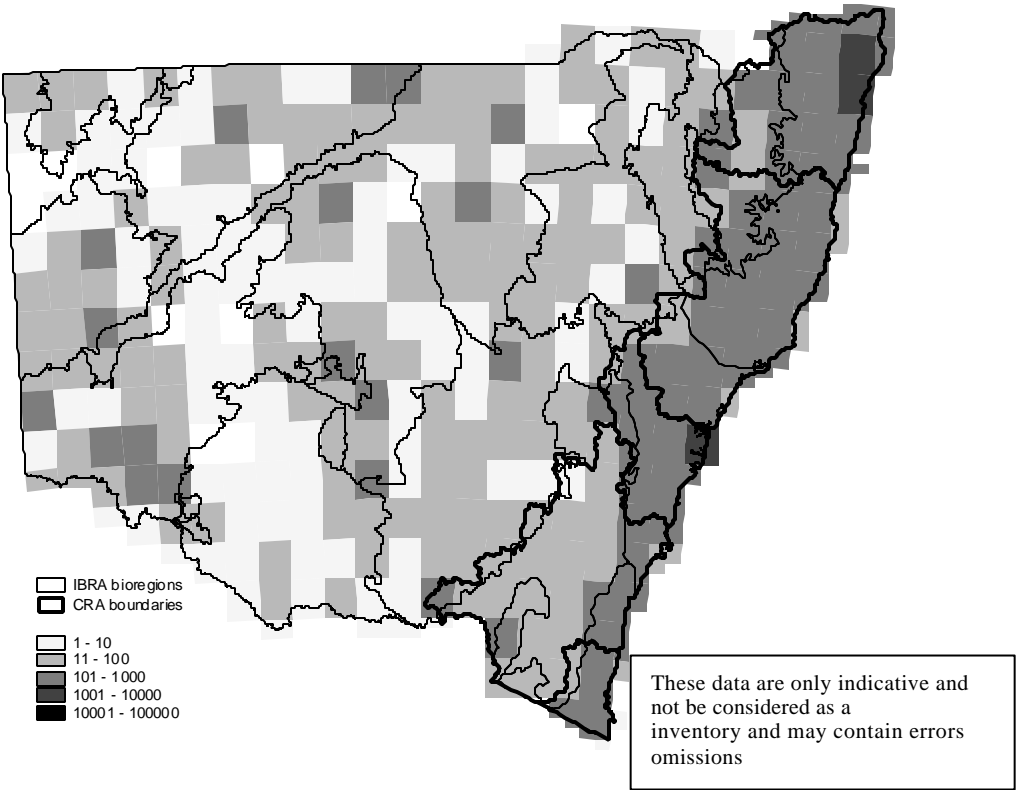
### Appendix 7b. Birds



Appendix 7c. Mammals



Appendix 7d. Reptiles



**DATA REQUIREMENTS WORKSHOP****1. DO YOU AGREE WITH THIS LIST?**

- base data layers for derived information to feed into regional planning [qualification]
- digital elevation model; best available and according to need and may vary by region
- Aboriginal cultural information; subject to comprehensive consultation

**1. SHOULD OTHER BASE LAYERS BE ADDED TO THE LIST?**

- should add each individual data layer that falls under each theme and include a glossary of terms to clarify definitions
- add land use (historical and current)
- add disturbance history
- add cultural heritage sites (indigenous and non-indigenous) landscapes
- up to date and uniform geology, soil and mineral potential layers
- add water as a theme with rivers and streams, stream order, ground water, surface water, salinity mapping, flood mapping and wetlands as base layers
- add up to date and uniform wood resource information

**2. REVIEW BOTH LISTS (1 AND 2) AND IDENTIFY THE HIGHEST PRIORITY BASE DATA LAYERS.**

- vegetation mapping

**3. HOW WOULD YOU USE THESE BASE LAYERS IN REGIONAL PLANNING.**

- base layers can be used directly to inform current initiatives and programs
- derived layers will be essential for strategic and sustainable planning

**4. WHAT ARE THE KEY DERIVED LAYERS FOR THE WRA?**

- |                                 |                                 |
|---------------------------------|---------------------------------|
| ■ salinity potential            | ■ land suitability / capability |
| ■ ecosystems                    | ■ land systems                  |
| ■ modelled plant communities    | ■ terrain indices               |
| ■ modelled species distribution | ■ socio-economic                |
| ■ threatening processes         | ■ vulnerability                 |



## **FUTURE SCOPING WORKSHOP**

### **1. GENERAL DISCUSSION (WHAT WILL THE WRA DO?)**

- provision of information to other planning processes
- provide conservation criteria and targets for these processes
- need core reserves as part of the wider protected area network, including off-park plus conservation and rehabilitation / restoration
- provide data layers across the State
- useful information – what will it be used for

### **2. DO YOU AGREE WITH THIS RECOMENDATION?**

- general for the strategy – set standards
- exercise for pilot region(s) to look at specific requirements
- also needed at project level

### **3. WHAT ISSUES SHOULD BE CONSIDERED AS PART OF A SCOPING PROJECT FOR OBTAINING INFORMATION FOR REGIONAL PLANNING PROCESSES?**

- cost / benefit analysis; needed and difficult to do (intangibles) for regional assessment and or data layers
- prioritisation; at Strategy level and Regional level
- identifying stakeholders; many
- linkages to existing stakeholder groups important
- development of a communication strategy with stakeholders
- need for a Steering Committee
- need Strategy to consult and involve Aboriginal people; Aboriginal people to develop this
- issues will vary between regions and statewide
- need for Issues Paper; snapshot for each region
- different to coast; more willing to look at partnerships
- identify existing data, what else is required
- identify costs; available expertise and location
- identify funding sources
- identify timelines
- identify inkind contributions
- community involvement and ownership of information; collection -> public acceptance -> many ways to do this, balanced with scientific rigour at all levels of work
- training needs; raise capacity of people / groups to participate in process
- review and monitoring; what to monitor and how, indicators, review periods
- socio-economic information / needs
- knowledge of projects out there

- need for technical support; socio / environmental economists
- need for indicators for socio-economic values; ie Treasury and WRA
- pressures and threats; economic and broader, need threat analysis
- regions; what will be used, bioregions, Aboriginal lands / nations, Local Government, Regional Vegetation Management Committee
- unit consistent with current planning; catchments, Local Government
- regions depend on data / uses -> don't lose information
- pilot; needs information already / planning processes / scale
- trial of process -> adaptive learning for next region

#### 4. DEVELOP STRATEGIES TO ADDRESS THESE ISSUES.

- need WRA Framework plus Regional Framework; plan of operation
- information must be useful; what will it be used for
- need to include experts and users
- “fuzzy” lines / boundaries on maps
- need to review conservation criteria for each region; eg CSIRO and Southern Mallee used thresholds, problems with targets too rigid, eg Central West thresholds exceeded
- thresholds vary between plant communities and temporally within communities
- guidelines of sensitivity
- monitoring / reporting approaches allows adaptive management, therefore Strategy would identify what is monitored / who in community and why / when and must be repeatable
- innovative ways of providing access to information needed
- need for tools to assist decision making; wood resource assessments, requirement for timber for new industry and cultural heritage

## **DATA MANAGEMENT WORKSHOP**

### **1. DO YOU AGREE WITH THIS LIST OF RECOMMENDATIONS?**

- Short Term      - Data Management Group formed; initial meeting involving wide-ranging interest groups to discuss issues and membership  
                      - answer to parent body; eg RACAC
- Longer Term    - establish parent body (govt agency) to continue on responsibility to represent users, data crunches and custodians

### **2. SHOULD OTHER DATA MANAGEMENT RECOMMENDATIONS BE ADDED TO THE LIST?**

- data management principles / manual prepared
- data ownership, custodianship and transfer standards
- access to data not readily available
- value adding
- establish information needs of clients / users / Stakeholders
- where govt funds project, ensure data is supplied in previously agreed format / standard
- communication of standards / access / new data available to other processes
- pricing policy
- metadata requirements
- many, many more

### **3. IDENTIFY THE MOST CRITICAL RECOMMENDATIONS FOR THE WESTERN REGIONAL ASSESSMENT.**

- establish Data Management Group

### **4. DEVELOP STRATEGIES TO ADVANCE THE MOST CRITICAL RECOMMENDATIONS.**

- prepare Data Management Document
- process for convening group, defining content of Data Document, assigning tasks; informed by Steering Committee / WRA Strategy
- 'Grey Data' (existing but inaccessible data sets) project as part of pilot study

**Trevor Hobbs** (CSIRO)  
**Martin Westerbrook** (Ballarat University College)  
**Andrew Denham**  
**Tony Auld** (NPSW)  
**Paul Burcher** (AES)  
**David Costello** (CSU, Mitchell)  
**Craig Gardener** (CSIRO)  
**Eric Whiting**  
**Peter Worsley** (NSW Ag)  
**Peter Kambouris** (Centre for Environmental Management)  
**Richard Adler** (Centre for Environmental Management)  
**Rod Knight** (ISOFISH)  
**Michelle Leishman** (Maquarie Uni)  
**Ted Moore** (CSIRO)  
**John Hosking** (NSW Ag.)  
**Damon Oliver** (UNE)  
**Sue Chittock**  
**Geoff Burrows** (CSU)  
**David Milledge**  
**Graham Harrington** (CSIRO)  
**Shelley Burgin** (UWS)  
**Daphne Gifford** (Paterson Allyn Valley Landcare)  
**Venita Colquhoun** (Greening Australia)  
**Mark Westoby** (Maquarie Uni)  
**Barbara Rice** (Maquarie Uni)  
**Joy Hafey** (Wirrimbirra Sanctuary)  
**John Brickhill** (NPWS)  
**Majorie Cochrane**  
**Steve Sass** (Riverina Frog Group)  
**Roger Oxley** (DLWC)  
**Pat Urbonas** (Society for Growing Australian Plants)

This section is provided as a brief overview of existing data initiatives that may need to be taken into consideration when fulfilling any of the recommendations.

### **Appendix 10a. National Land and Water Resources Audit**

“Our mission is to provide nationwide assessments of Australian’s land, vegetation and water resources to support sustainable development now and in the future”.

The National Land and Water Resources Audit is one of the programs funded by the Natural Heritage Trust. The Audit is to provide a comprehensive national appraisal of Australia’s natural resource base. Natural Resource Management needs will be met in the following areas:

- policy assessment and development;
- investment decisions;
- evaluating program and policy performance; and
- direct resource management, particularly by government.

The objective of the National Land and Water Resources Audit is to facilitate improved management of land and water resources by:

- providing a clear understanding of the status of, and changes in, the nation’s land (including vegetation) and water resources and implications for their sustainable use;
- providing an interpretation of the costs and benefits (economic, environmental, and social) of land and water resource change and any remedial actions;
- developing a national information system of compatible and readily accessible land and water data;
- producing national land and water (surface and groundwater) assessments as integrated components of the Audit;
- ensuring integration with, and collaboration between, other relevant initiatives; and
- providing a framework for monitoring Australia’s land and water resources in an ongoing and structured way.

### **Appendix 10b. NSW Natural Resources Data Directory**

The NSW Natural Resources Data Directory (NRDD) is a digital directory of a wide range of natural resource information for New South Wales. The information described (called data sets) covers flora, fauna, land, water and air, and is primarily held by government agencies. The directory is available in draft form via the Internet at [www.nrims.nsw.gov.au](http://www.nrims.nsw.gov.au).

Each listing (called metadata) in the directory summarises a data sets content and form, with the intention of helping you decide whether to pursue it further. As a catalogue, it gives contact details for inquiries about the information, but the data itself is not directly accessible. Entries in the directory conform to Australia New Zealand Land Information Council (ANZLIC) Metadata Guidelines.

The Natural Resources Data Directory is the NSW node of the Australian Spatial Data Directory, a national catalogue of metadata that is part of the Australian Spatial Data Infrastructure.

### **Appendix 10c. NSW Metadata Working Group**

ANZLIC through its Metadata Working Group is actively pursuing an objective to implement a distributable national directory system to form a foundation for the Australian and New Zealand Spatial Data Infrastructures. The various State and Commonwealth jurisdictions are currently collecting metadata, to provide an extensive national picture of available spatial data. The NSW Metadata Working Group are focusing their activities on the

full implementation of the Australian Spatial Data Directory distributed by November 1999, including distributing nodes for this directory to be fully implemented later this year.

#### **Appendix 10d. NSW State Mapping Advisory Committee**

Their objective is to maximise the benefits to the people and government of New South Wales from investment in spatial and spatially related data and associated products.

#### **Appendix 10e. Inter-governmental Committee on Surveying and Mapping**

Their core function is to coordinate and promote the development and maintenance of key national spatial data including geodetic, topographic, cadastral and geographical names. ICSM carries out its role by meeting its objectives in the areas of Geodesy; National topographic data; National hydrographic data; trans-Tasman cooperation; and international links and liaison. This role is to provide leadership through coordination and cooperation in surveying, mapping and charting by:

- addressing national and international surveying, mapping and charting issues;
- supporting the development and implementation of national and international standards for surveying, mapping and charting;
- providing a national and trans-Tasman forum for identifying and developing surveying, mapping and charting policy and technology issues; and
- encouraging and sponsoring research into surveying, mapping and charting.

#### **Appendix 10f. NSW Natural Resources Information Management Strategy**

At a Forum on Natural Resources Information Management on 26 February 1996, the heads of the major NSW Government natural resource and environmental agencies agreed that NSW needed a whole-of-government approach to the management of natural resources information. The Forum decided to produce a formal Information Management Strategy, which would include the issues, direction and timetable for the whole-of-government management of natural resources information. A Steering Group representing thirteen NSW government agencies was formed to develop and implement the strategy.

The objectives are:

- To create the natural resources information infrastructure needed to support the environmental, economic and social interests of NSW.
- To maximise access to natural resources information.
- To implement the national standards and guidelines necessary to enable the effective use and integration of natural resources information.

This strategy is currently under review.

#### **Appendix 10g. Integrated Community Mapping and Information Support System**

Department of Land and Water Conservation is custodian for one of the largest electronic and paper-based holdings of resource management data in NSW. This holding is the foundation of policy and management decisions affecting the future of both natural and cultural resources of NSW. To make sense of information it needs to be integrated (coordinated in space), searchable and appropriate to the needs of the receiver. ICMISS was proposed as a system to display a 'bird's-eye-view' of a region (this can be any arbitrary boundary containing data of interest) and to present known information within it. The ICMISS prototype provides access to maps, tables, real time data, text and reports from a variety of GIS, database, text and image sources and includes searchable metadata for each of these. The source data is stored at different locations on the Internet and combined by the ICMISS server when requested by users. This project is not yet fully functional.

## **Appendix 10h. Australian and New Zealand Land Information Council**

ANZLIC's mission is to provide leadership for effective management and use of land and geographic information to support economic growth, sustainable development and the social and environmental interests of Australia and New Zealand. By the year 2000, ANZLIC will deliver:

- a national focus for strategic spatial information initiatives;
- a strategic organisational framework;
- spatial data infrastructures for Australia; and
- the environment to support better decision-making.

## **Appendix 10i. Community Access to Natural Resource Information**

This is a program of funding to aid the community to access traditionally government based digital spatial information. The program covers issues such as Internet based data request and delivery, online data search and development of comprehensive databases for natural resource data to serve the community in planning, assessment and information. This project is coordinated by DLWC.

## **Appendix 10j. NSW State Biodiversity Strategy**

The NSW Biodiversity Strategy emphasises that the conservation of biodiversity requires a collaborative effort, supported by the entire community. The NSW Government is committed to ensuring that the community has a greater role in decision-making on biodiversity issues. This will require a community that is both informed, willing to participate in and initiate conservation activities.

Actions to achieve greater community involvement in biodiversity conservation through bioregional planning and a whole of government approach are central features of the Strategy. It outlines actions to improve the biodiversity information base, provide educational opportunities and also provides support for community partnerships between the diverse range of individuals, organisations and agencies involved in biodiversity conservation.

The Strategy has been ratified by government and \$5.3m have been allocated over 3 years to begin the work identified within the Strategy. The Western Regional Assessment and the various planning processes will need to take account of the Strategy and be consistent with the Strategy.

## **Appendix 10k. Architecture for Access to Government Information**

The IMSC-Technical Group as charged with producing a report for submission to the IMSC, investigating access architectures to government information and recommending future actions.

## **Appendix 10l. Discovery 2000**

The Discovery 2000 Exploration Initiative is an important New South Wales Government program to accelerate the development of the mineral resources industry in the State. The Government is investing \$35 million over the six year period to the year 2000 to provide an enhanced geological, geophysical and information framework to create an environment for mineral exploration growth in the mining sector.

## **Appendix 10m. Western Lands Review**

The terms of reference are as follows:

- review and report on the effectiveness of the operation of the Western Lands Act and associated Acts on the management of western lands
- identify issues which impact on the long term sustainable management of western lands addressing economic, social and environmental outcomes

- recommend actions required to implement sustainable management and use of the western lands resources including appropriate legislation, institutions and tenure agreements

## **Appendix 10n. Protocol on the quality and usefulness of vegetation survey and mapping datasets**

**Description:** An interdepartmental committee on vegetation management coordinated by DLWC approached the RBG to prepare a protocol on data standards for vegetation mapping and survey. The protocol would include descriptions and provide examples of different qualities of data. It would also outline the usefulness of different types of data. Some data are misused in GIS either because it is used at too fine a scale, or its quality is not up to national or state standards. These standards relate to those being developed for Australia by the National Land and Water Audit and those to be described in NSW Guidelines for Vegetation Survey and Mapping (see below). The topics of mapping scale/quality and survey intensity/quality will be discussed in the Protocol. Existing vegetation data sets in the Natural Resources Data Directory could be assigned a code from this protocol. This would then be a guideline for the use of the data by regional vegetation committees and other users. A preliminary protocol is outlined on pages 25-26 in Benson, J.S. (1999) *Setting the Scene: the native Vegetation of NSW* Background Paper No. 1 Native Vegetation Advisory Council: Sydney. This paper should be published and widely distributed soon.

**Status:** This protocol is to be compiled by John Benson of the RBG under a steering committee. Funding from DLWC was promised for March 1999 but it has not yet eventuated.

## **Appendix 10o. Preparation of Guidelines for Vegetation Survey and Mapping**

**Description:** There is no statewide set of guidelines for vegetation survey and mapping in NSW. Given that vegetation mapping may accelerate over the next decade to meet the demands of the native Vegetation Conservation Act and other laws, these are urgently required.

An interdepartmental committee on vegetation management coordinated by DLWC approached the RBG to prepare Guidelines on Vegetation Survey and Mapping. This would be similar to the South Australian guidelines but may develop into a field manual. The guidelines would describe how to sample the landscape for vegetation and how to map vegetation from aerial photographs or by other means. Specimen collection, recording, identification and herbarium procedures would be outlined. The aim of the guidelines would be to standardise how floristic site data are collected and how mapping is done throughout NSW – not just by Government agencies but also consultants and local government. A site survey proforma would be attached to the guidelines developed from existing proformas used by agencies and for the CRA. This would contain mandatory and non-mandatory fields.

**Status:** This protocol is to be compiled by John Benson of the RBG under a steering committee. Funding from DLWC was promised for March 1999 but it has not yet eventuated. It is anticipated this would take 6-12 months to develop to a published state. The protocol outlined in 5n above would be referred to in the guidelines.



## **Appendix 10p.      Classification of the plant communities of New South Wales and assessment of their conservation and threat status.**

**Description:** This project would update the classification of NSW vegetation published in table 4 of Benson, J.S. (1989) *Establishing priorities of the conservation of rare or threatened plants and plant associations in NSW* Occasional Paper 2 (Australian Committee of IUCN: Canberra). This paper listed 430 plant communities under major environmental domains in NSW. It has often been quoted in land assessments and EISs by a number of authorities and private individuals. Many reserves have been established, at least in part, due to the 1989 assessment ratings of certain plant communities. However, due to the dedication of many reserves and a large number of vegetation surveys in the intervening period, Benson (1989) is out of date.

The project would reclassify the vegetation of NSW at a regional scale taking into account key vegetation mapping, surveys and expert advice. Data on each plant community would be placed onto an Access database. Fields would include existing extent, pre-European extent, area reserved, bioregional extent, mapping extent, key references, conservation status code, threat status code and others. Many fields in the database would have reliability ratings assigned to data in them – ranging from measured to coarse estimate by an expert. Threat status codes would be similar to the IUCN codes for species and based on rules being developed in Australia and overseas.

Over a longer time frame fine scale vegetation mapping may replace or lead to modifications of this database. It is proposed that the classification be published in a refereed journal, but also be placed on the Internet. It could be regularly updated as more information comes to hand.

**Status:** Funds will be allocated to John Benson of the RBG under the Biodiversity Strategy Program. The project should commence in August 1999 and be completed 15 months later. Its success will largely rely on the cooperation of other agencies, particularly the NPWS concerning the classifications derived in the Comprehensive Regional Assessments in eastern NSW.

**APPENDIX 11. EXPENDITURE AT APRIL 1999**

| CODE | LINE ITEM                                    | ALLOCATION | ACTUAL<br>EXP<br>YTD<br>17,371.98 | BUDGETED<br>EXP YTD | BUDGET<br>VARIANCE<br>\$ | BUDGET<br>VARIANCE<br>% | EXISTING<br>COMMITMENTS | TOTAL<br>UTILISED<br>(expenditure<br>& existing<br>commitments<br>) | CURRENT<br>BALANCE<br>OF<br>FUNDS | FORWARD<br>COMMITMENTS | PROJECTED<br>FINAL<br>EXPEND | SURPLUS<br>O/EXPEND |
|------|--|------------|-----------------------------------|---------------------|--------------------------|-------------------------|-------------------------|---|-----------------------------------|------------------------|------------------------------|---------------------|
|      | C/fwd expenditure                            |            |                                   |                     |                          |                         |                         |   |                                   |                        |                              |                     |
| 1121 | <b>"A" Items:</b><br>Wages - Temp Assistance | 80,000.00  | 64,320.42                         | 66,666.67           | (2,346.25)               | (0.04)                  | 15,141.81               | 79,462.23   | 537.77                            |                        | 79,462                       | (538)               |
| 1311 | Annual leave loading                         |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 1321 | Leave on resignation                         |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 1412 | Superannuation                               |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 4021 | On costs                                     | 20,800.00  | 16,723.31                         | 17,333.33           | (610.02)                 | (0.04)                  | 3,936.87                | 20,660.18   | 139.82                            |                        | 20,660                       | (140)               |
|      | <b>"B" Items:</b>                            |            |                                   |                     |                          |                         |                         |   |                                   |                        |                              |                     |
| 2022 | Advertising                                  | 2,000.00   | 85.20                             | 1,666.67            | (1,581.47)               | (0.95)                  | 1,740.29                | 1,825.49  | 174.51                            |                        | 1,825                        | (175)               |
| 2042 | Asset Purchases <\$5000                      |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2081 | Books/Periodicals                            |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2091 | Fees - Catering                              |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2131 | Fees - Conferences                           |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2151 | Fees - Contractors                           | 152,800.00 | 61,021.05                         | 127,333.33          | (66,312.28)              | (0.52)                  | 59,769.00               | 120,790.05  | 32,009.95                         | 30,000                 | 150,790                      | (2,010)             |
| 2161 | Freight & Cartage                            |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2212 | Hire - Motor Vehicles & Equip                | 5,000.00   | 4,897.00                          | 4,166.67            | 730.33                   | 0.18                    | -                       | 4,897.00  | 103.00                            |                        | 4,897                        | (103)               |
| 2252 | Fuel & Oil - M.V. Equipment                  | 2,000.00   | -                                 | 1,666.67            | (1,666.67)               | (1.00)                  | -                       | -   | 2,000.00                          |                        | -                            | (2,000)             |
| 2261 | Postal Expenses                              | 300.00     | 300.00                            | 250.00              | 50.00                    | 0.20                    | -                       | 300.00  | -                                 |                        | 300                          | -                   |
| 2271 | Printing                                     | 15,000.00  | -                                 | 12,500.00           | (12,500.00)              | (1.00)                  | -                       | -   | 15,000.00                         | 1000                   | 1,000                        | (14,000)            |
| 2281 | Publicity & Education                        |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2341 | Stores & Stationery - General                | 700.00     | 700.00                            | 583.33              | 116.67                   | 0.20                    | -                       | 700.00  | -                                 |                        | 700                          | -                   |
| 2351 | Telephone Expenses - Calls                   | 4,000.00   | 4,000.00                          | 3,333.33            | 666.67                   | 0.20                    | -                       | 4,000.00  | -                                 |                        | 4,000                        | -                   |
| 2352 | Telephone Expenses - I & R                   |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2353 | Telephone Expenses - Rent                    |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 2371 | Travel & Subsistence                         | 4,000.00   | 2,200.10                          | 3,333.33            | (1,133.23)               | (0.34)                  | -                       | 2,200.10  | 1,799.90                          | 1000                   | 3,200                        | (800)               |
| 2391 | Miscellaneous Expenses                       | 3,000.00   | -                                 | 2,500.00            | (2,500.00)               | (1.00)                  | -                       | -   | 3,000.00                          | 500                    | 500                          | (2,500)             |
| 3201 | Computer hardware maint.                     |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 7268 | Assets over \$5,000                          |            | -                                 | -                   | -                        | -                       | -                       | -   | -                                 |                        | -                            | -                   |
| 6343 | Grants and Subsidies                         |            |                                   |                     |                          |                         |                         |   |                                   |                        |                              |                     |
|      | <b>TOTAL</b>                                 | 289,600.00 | 171,619.06                        | 241,333.33          | (69,714.27)              | (0.29)                  | 80,587.97               | 252,207   | 37,393                            | 32,500.00              | 284,707                      | (4,893)             |