Department for Environment and Heritage

Vegetation Survey Report
Bimbowrie Station

Final Report

Government of South Australia

By

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Abstract

A one-week survey of the flora of Bimbowrie Station was undertaken in April 2005. There were 2 teams of two people conducting the native vegetation survey, using the Biological Survey of South Australia methodology. A monitoring component to the project was also conducted, involving the re-visit to existing Pastoral Monitoring Points. The Bimbowrie Station Monitoring Review Report, Proposed Monitoring Program by Frank Kutsche and John McDonald examine the results of this component of the project and will not be discussed further in this report.

All flora present within an equivalent area of 100m x 100m was recorded at thirty sites. During the survey the following were recorded:

- Three hundred and thirteen plant specimens were lodged with the Plant Biodiversity Centre,
- Four hundred and eighty eight plant species were recorded, of which one hundred and forty eight were unique,
- Eighteen non-indigenous plant species were recorded with fifty-eight recordings.

In addition to documenting the flora of Bimbowrie Station, this report details the vegetation mapping process and results.

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Acknowledgements

This survey was coordinated by Sue Kenny and assisted by personnel from the Biological Survey and Research Branch of the South Australian Department of Environment and Natural Resources (DENR).

Fieldwork

This survey ran for a one-week period. The following personnel were involved:

Vegetation
S. Kenny, K. Bevan, K. Graham, and E. Roberts..

Specimen identification

The assistance of the Plant Biodiversity Centre is gratefully acknowledged, particularly R. Taplin, H. Vonow and A. Ramsay.

Data entry

K. Bevan, with assistance from E. Roberts and S. Kenny.

Mapping and Vegetation Analysis

The vegetation analysis and mapping was conducted by S. Kenny using Environmental Systems Research Institute's (ESRI) geographic information system (GIS) software package ArcMap 8.3.

Other

Thanks also to Robin Young for piloting an aerial surveillance over the park during the survey to assist in the vegetation mapping process and to Darren Wilson, Manager of Bimbowrie Station for assistance and help with facilities within the park.

The advice, knowledge and experience of John McDonald, Justin Jay and Frank Kutsche, pastoral monitoring group, was also invaluable and appreciated.

Introduction

BACKGROUND AND AIMS

For some years now the South Australian Department for Environment and Heritage (DEH) have been carrying out a series of systematic surveys of the vegetation and vertebrate fauna of large regions of South Australia. A previous survey of the North Olary Plains, 1995 – 1996, provided a baseline of data for Bimbowrie Station, with survey sites and vegetation mapping at the regional scale.

The focus of this survey was to conduct a more detailed vegetation survey of the park, to better meet the management needs of the park. The resultant inventory of flora species and vegetation map provide the backbone for future management plans for the new park. The station was only de-stocked of sheep in early 2005. Conducting the vegetation survey in April 2005 will provide a baseline for monitoring long-term change in the park.

There was also a subsequent fauna survey of the park, visiting the flora sites mentioned in this report. Environmental and Biodiversity Services (EBS) conducted this fauna survey during May 2005, using the Biological Survey of South Australia methodology.

The selection of sites in this survey was therefore determined primarily by the presence of previous sites, accessibility, and getting a comprehensive coverage across the entire park with representative sites in most vegetation associations.

Methodology

The Bimbowrie vegetation survey followed the standards and survey methodology of the Biological Survey of South Australia, developed by the Department for Environment and Heritage.

The methods used for the classification, assessment and mapping of native vegetation were :-

a. Digital data compilation
b. Survey site selection
c. Field Survey
d. Data entry and validation
e. Data analysis and classification
f. Vegetation Mapping
g. Data base consolidation

Digital Data Compilation

The compilation of a digital data layer is required to assess what data currently exists. This includes the location of line features such as roads and tracks, point features such as existing biological survey sites and pastoral monitoring sites and polygon features such as the existing North Olary Floristic Vegetation Mapping. The incorporation of aerial photography, 1:50,000 map sheet boundaries and placenames assisted in further identifying features of the park. All these features were incorporated into an ESRI ArcMap mapping document.

A pre-survey field trip was undertaken in March 2005. The ArcMap mapping document and aerial photography were loaded onto a personal computer, with a GPS (Global Positioning System) interface. This allowed the viewing of the aerial photography interactively with an accurate locational pointer (from the GPS unit) to determine what tones and textures on the aerial photography were in relation to the "real world". It also allowed the easy navigation to existing data points such as pastoral monitoring sites. The ArcMap environment on the laptop was also used to create a new point feature coverage with attributes that described what was present at each of these new point locations, such as the dominant flora species or the fact that it may be a good area to place a survey site and the reasons why. These points were captured as the park was traversed by vehicle. The track log facility within the GPS unit was also used to gather more accurate information on the location of tracks within the park. This was subsequently downloaded as a new line feature within the ArcMap mapping document to further aid in the site selection process.

Survey Site Selection

The survey sites were selected based on the knowledge obtained from the pre-survey trip, providing an even coverage across the park and sampling as many of the vegetation communities observed as possible, taking into account different

landforms, geology and soil types. Some sites were selected at existing Pastoral monitoring sites. Pastoral monitoring staff were eager to get a comprehensive species list with vouchered specimens for comparison purposes post survey.

An estimate of the number of sites that could be achieved by two survey teams within the survey period of one week was also determined. A total of 30 survey sites were determined as achievable, providing a site density of 1 site per 2,409 Hectares

Survey site locations were generally selected away from ecotones or highly disturbed areas and placed where access would not be too difficult or less than 200 metres from the track.

The selected survey sites were documented with the reasons the sites had been selected and what plant species were expected to be sampled at each site.

The sites were coded based on the park name, the number of the site to be visited within the park and the quadrat. Thus the sites were numbered BIM00101 to BIM03001.

Field Survey

Each site consisted of a 100m x 100m quadrat, or equivalent area, from which the details of the vegetation and physical attributes were recorded. The information collected at each site is listed below in Table 1. Each team was provided with GPS coordinates of the sites they were to visit and maps specifically designed to show the location of all survey sites and all tracks. Figure 1 is an example of the map provided for teams determining their daily travel plan to sites. This map has the existing floristic mapping available at that time displayed, which is the North Olary Plains Vegetation Mapping, which was captured at the scale of 1:100,000.

The full methodology of site data collection can be found in the Guide to a Native Vegetation Survey using the Biological Survey of South Australia (Heard and Channon (1997). Each site was permanently marked with a pair of star droppers, one with a survey disk attached, indicating the survey number, site number and disk number.

The teams were based at the Antro Woolshed accommodation on the western side of the park. This meant some long and arduous journeys to some sites on the eastern extent of the park, but this was offset with the benefits obtained from a team camp environment, where nightly discussions on specimens found and daily highlights were discussed.

There was also an aerial flight over the park undertaken on 22nd April 2005, using the Department for Environment and Heritage plane piloted by Robin Young. This allowed the capture of further data, with manual notations made onto pre-printed maps with the aerial photography shown and digital imagery was taken from the windows with GPS notations made of their source. The overview of the vegetation communities in the park, particularly areas that are inaccessible due to the lack of tracks was invaluable in the subsequent mapping process.

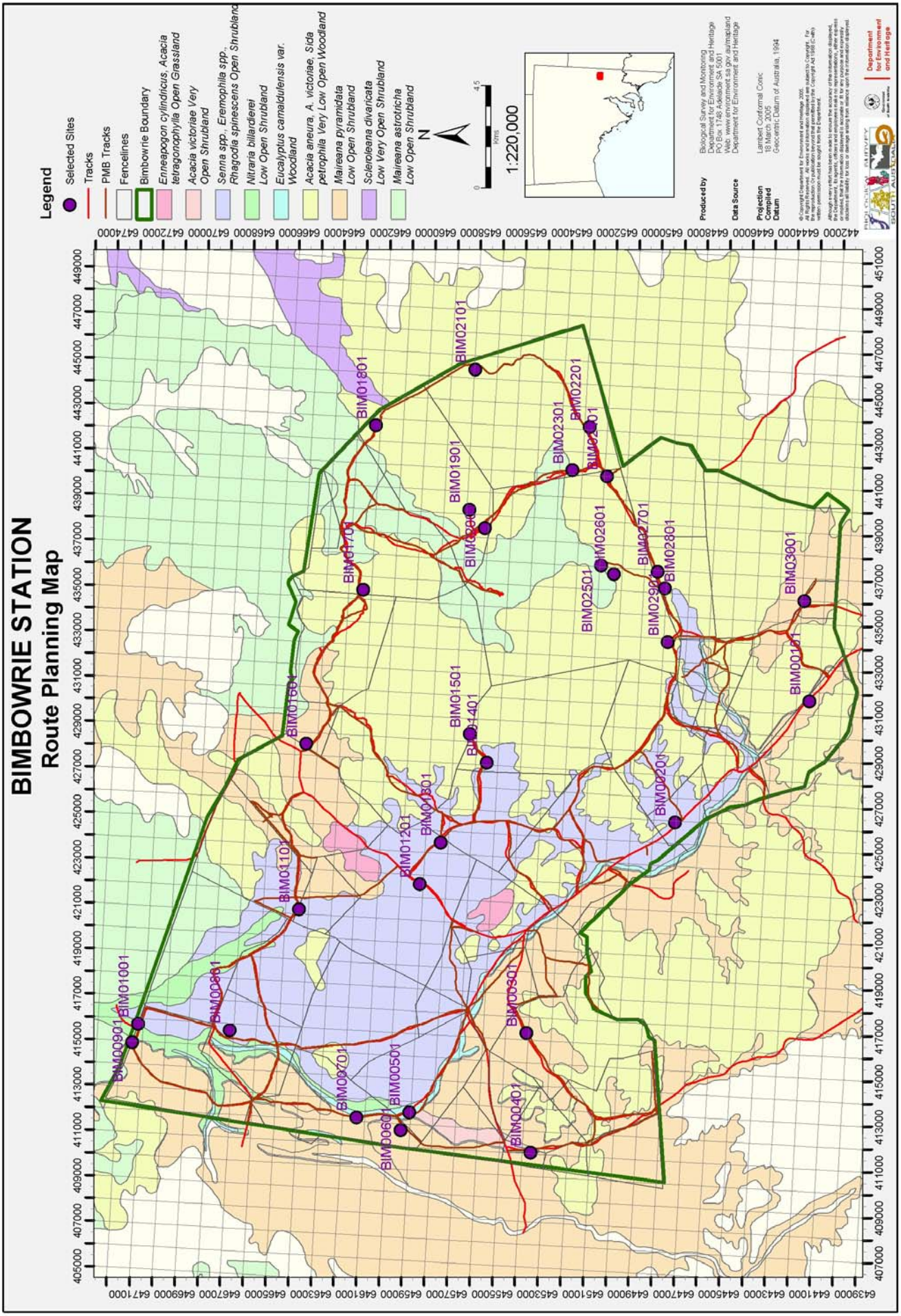
Table 1: Data Collected during Field Survey

		FIELD DATA COLLECTED
		Physical Datasheet
1.	*	Site number
2.	*	Observers
3.	*	Survey date
4.	*	Field sequence (week, group, sequence of site surveyed in the field)
5.		Hundred
6.		Section
7.		Property (type of public land)
8.		Owners
9.		Mapsheet number
10.		Mapsheet name
11.	*	Amg zone
12.	*	Easting
13.	*	Northing
14.	*	Altitude
15.	*	Reliability (accuracy of location)
16.	*	Quadrat size (if not 30 x 30 m)
17.	*	Aerial survey / photo number
18.		East (measurement to pin prick in aerial photo [mm] from western photo edge)
19.		North (measurement to pin prick in aerial photo [mm] from southern photo edge)
20.		Site photo number
21.		Direction of site photo (degrees)
22.		Location map (sketch of location) locations comments (directions to the site from local major features)
23.	*	General landscape description
24.		Site landform pattern
25.	*	Site landform element (type)
26.	*	Site slope (degrees)
27.	*	Site aspect (degrees)
28.		Outcrop cover
29.		Outcrop lithology
30.	*	Surface strew size
31.	*	Surface strew cover
32.	*	Surface strew lithology
33.		Fire scars (y/n) last fire (year)
34.		Bare earth/litter estimate %
35.		Presence of erosion and comments
36.	*	Surface soil texture class
		Vegetation Datasheet
37.		Climatic condition
38.	*	Plant species name
39.	*	Voucher number
40.		Lifeform (using Muir's' table)
41.	*	Cover/abundance (adapted Braun-Blanquet measure)
42.		Life stages (flowering fruiting budding etc.) / Comments (about the plant species / voucher specimen)
43.		Structural summary of the vegetation (structural assemblage)S

		FIELD DATA COLLECTED
44.	*	Vegetation association description (overstorey dominant species, structural description (using Muir's' table), dominant shrub & ground species)
45.		Upper stratum age class (presence/absence of seedlings, saplings, mature trees, senescent trees and hollows for dominant/codominant overstorey tree/mallee species)
46.	*	Overstorey height (five estimates)
47.	*	Crown depth (five estimates)
48.	*	Canopy diameter (five estimates)
49.	*	Gap (ten estimates)
50.	*	Canopy type %
51.		Overall vegetation comments, including emergents (if relevant)

** Considered to be essential for mapping and analysis and thus comprise the minimum data set.*

Figure 1: Route Planning Map



Data Entry and Validation

At the completion of the survey all vouchered plant specimens were lodged at the Plant Biodiversity Centre. The specimens were examined and identifications determined by R. Taplin. The vegetation datasheets were then updated according to these final determinations. The datasheets were also checked for completeness and correctness. Checks were made to ensure each team had vouchered each new plant specimen found.

The data was then entered into the Department's Oracle relational database, Survey. This database contains a number of validation routines, with valid lists (look up tables) to assist in the currency of the taxonomy of the species and to limit the possible valid combinations of data entry into fields. The location data was downloaded from the GPS units and electronically loaded into the system.

After the initial data entry phase, further validation routines were conducted on the data. This included the manual "read-back" checking of all the field data collected with reports generated from the database. There were also unique counts generated of the plant species collected and the lifeform recorded of each species. Checks were then made that the data recorded was acceptable.

There were also some Opportune observations made, which were entered into the Department's Oracle relational database, Opportune. These were flora specimens collected outside of survey sites or fauna sightings or collections.

The digital images taken at survey sites and the additional images taken across the park were also entered into the SA Biological Image Reference System, an internal departmental Access database.

Data Analysis and Classification

The aim of the data analysis was to determine the composition of plant communities within the park and subsequently map their occurrence.

The vegetation survey data within the park was initially examined, including previous survey site data. The Pastoral monitoring sites were not incorporated into the analysis as the data collected at these sites was not in a suitable format and the plant specimens were not vouchered, thus exposing a degree of uncertainty regarding the data. As there was often only data for one or two survey sites per vegetation community, the final analysis included all survey site data within a 10km radius of the park boundary. This enhanced the membership for each mapping group. The survey site data was analysed subjectively to determine the floristic vegetation mapping groups, defined by the dominant overstorey and understorey species and by the dominant overstorey structure, resulting in 14 mapping groups.
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The structural descriptions of each mapping group were based on a frequency analysis of the structural descriptions recorded at each site. The landform pattern, landform element and soil type were also parameters examined in the decision process of group memberships.

The vegetation mapping process would also require the inclusion of the data into the National Vegetation Information System (NVIS) system. There are currently about

1,000 vegetation group descriptions stored within the South Australian component of this Australia wide program. It was necessary to compare the 14 floristic group descriptions determined from the Bimbowrie Survey with the floristic descriptions in the NVIS database, to reduce the introduction of new codes into the NVIS System. It was found that there were 9 suitable groups existing, and these were subsequently used. Most of these came from the previous North Olary Plains floristic group descriptions.

Vegetation Mapping

The vegetation mapping process added a further 2 mapping groups based on field data collected during the pre-survey trip, but lacking survey site data for analysis.

The mapping process was conducted using Environmental Systems Research Institute's (ESRI) geographic information system (GIS) software package ArcMap 8.3 with on-screen data capture. Floristic boundaries were captured electronically with the 1:84,000 colour aerial photography displayed within the ArcMap environment. The data was captured at 1:20,000 scale based on interpretation of different tones, textures and topography. Figure 2 shows the aerial photography for the park.

The point coverages of survey site locations, in-field data collection notes and pastoral monitoring sites were also displayed to assist in imagery interpretation. These areas were examined first and the polygons coded accordingly with the determined mapping group codes. The polygons that had no field data present were determined by extrapolation based on knowledge obtained from the previously determined polygons. The pastoral monitoring sites were used within this process as they provided key overstorey species descriptions with an indication of dominance. Figure 3 provides an example of the on-screen data capture process within ArcMap, including the attributes required to be coded. The coding of attributes required for the NVIS database and the departmental floristic coverage metadata were captured concurrently within the same mapping coverage.

Data Base Consolidation

On completion of the mapping component of the project, databases are consolidated and documented to ensure information is easily accessible to all those who wish to access it. This involves completing all metadata records for the Oracle database and incorporating all the digital data into correct locations. The floristic mapping is kept as a regional mapping product with a layerfile generated and also incorporated into the Statewide NVIS coverage, all with relevant documentation and metadata.

Figure 2: Aerial Photography Map

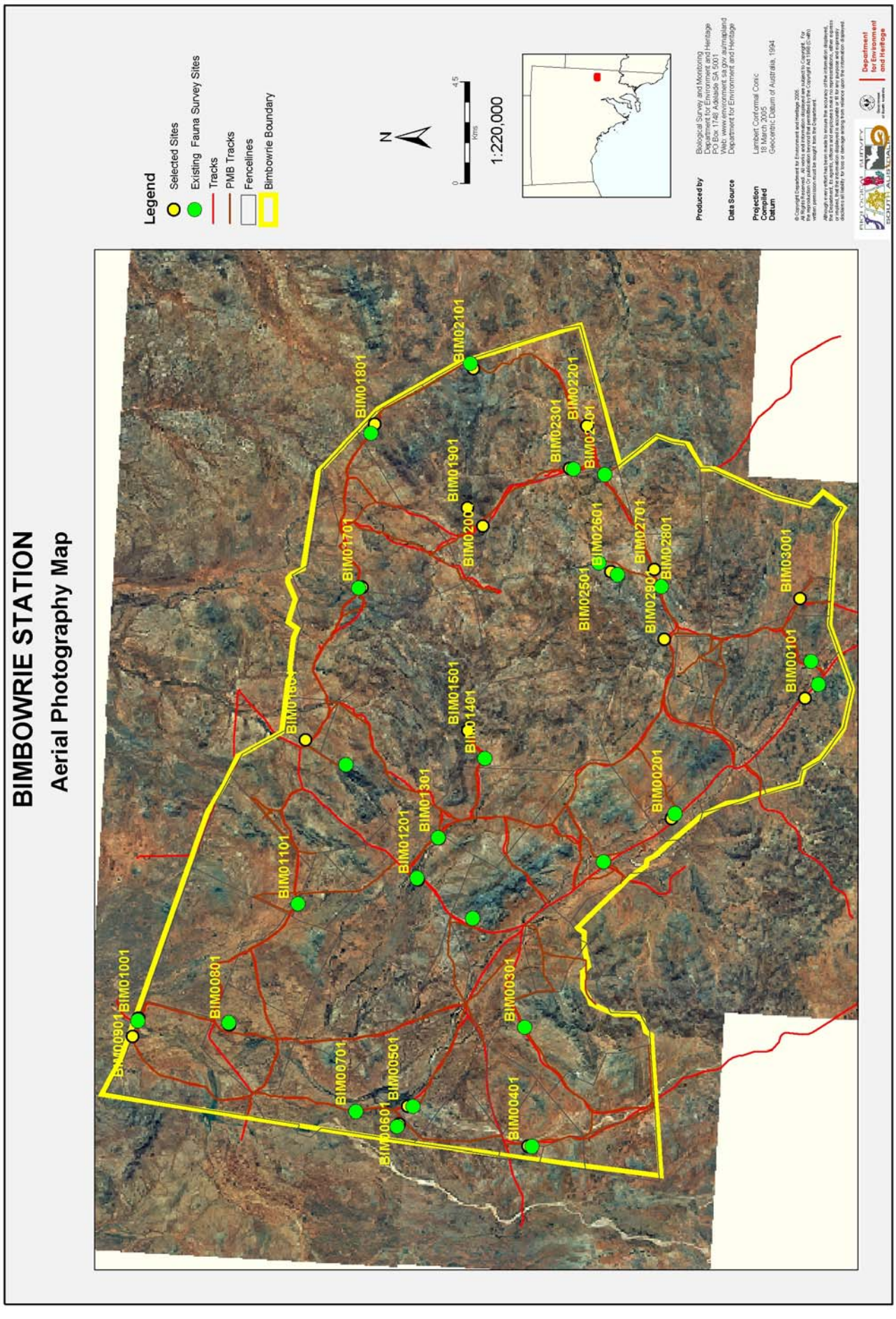
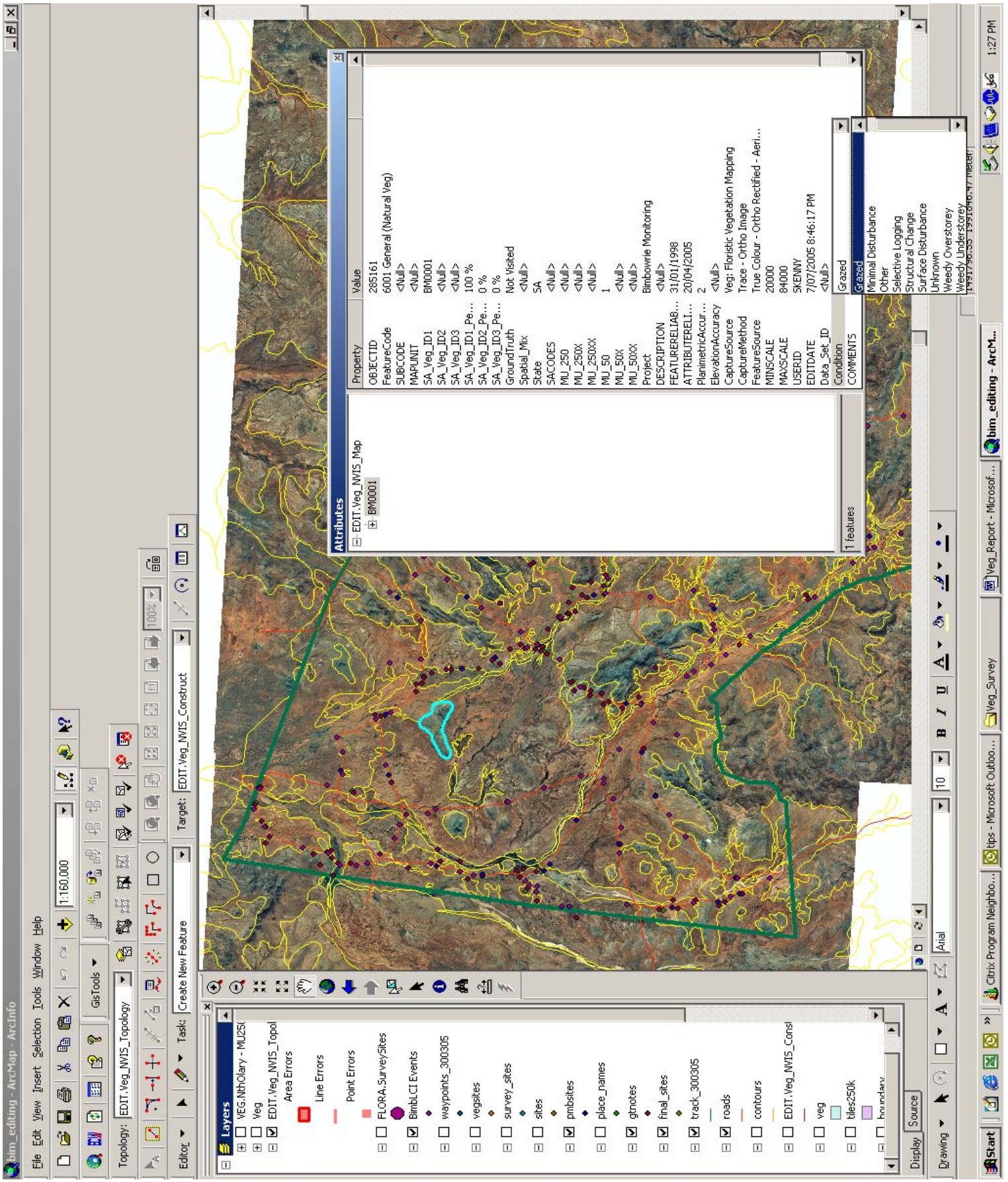


Figure 3 : On-screen Data Capture



Results

Plant Records

At the conclusion of the Bimbowrie Native Vegetation Survey, April 2005, 30 sites had been comprehensively surveyed within the 72,270 hectares of the park.

The survey resulted in 488 plant species records being entered into the Oracle Survey Database, providing distribution and abundance data on 148 unique plant species recorded within the park. Of the 488 plant records, 313 individual specimens were collected and lodged with the Plant Biodiversity Centre.

It was unfortunate that due to the project constraints the survey was conducted during a very dry season, with an extended period of dryness preceding the survey. This is reflected in the low number of annuals and grasses recorded at each survey site and general low species diversity. It also hindered the plant identification process, with a lot of the specimens collected as dead material. The paucity of identifiable material also resulted in more material being collected due to the uncertainty of the species field identification.

Table 2 lists the unique counts for each of the species found during the survey, in order of highest occurrence to lowest.

It was also noted that the original North Olary Plains survey sites within the park had *Acacia ayersiana* var. *latifolia* recorded as present. This species was not recorded or collected during the Bimbowrie native vegetation survey. For analysis purposes, this species was treated as *Acacia aneura* var.

Table 2 : Frequency of Species found during the survey

SPECIES	FREQUENCY
Maireana pyramidata	19
Enchylaena tomentosa var. tomentosa	18
Rhagodia spinescens	16
Ptilotus obovatus var. obovatus	13
Acacia victoriae ssp. victoriae	12
Schismus barbatus	12
Sclerolaena patenticuspis	11
Dodonaea viscosa ssp. angustissima	10
Lysiana exocarpi ssp. exocarpi	10
Dissocarpus paradoxus	9
Dodonaea lobulata	9
Sclerolaena obliquicuspis	9
Sida petrophila	9
Sisymbrium erysimoides	9
Solanum ellipticum	9
Centaurea melitensis	8
Olearia pimeleoides ssp. pimeleoides	8
Sclerolaena diacantha	8

Solanum petrophilum	8
Atriplex vesicaria ssp.	7
Eremophila sturtii	7
Lepidium papillosum	7
Abutilon leucopetalum	6
Austrostipa nitida	6
Enneapogon avenaceus	6
Maireana brevifolia	6
Leiocarpa semicalva ssp. semicalva	5
Maireana appressa	5
Maireana astrotricha	5
Salsola kali	5
Acacia aneura var.	4
Acacia tetragonophylla	4
Actinobole uliginosum	4
Callitris glaucophylla	4
Calotis hispidula	4
Carthamus lanatus	4
Cassinia laevis	4
Lycium ferocissimum	4
Sclerolaena brachyptera	4
Silene apetala	4
Acacia oswaldii	3
Aristida holathera var. holathera	3
Aristida nitidula	3
Asphodelus fistulosus	3
Casuarina pauper	3
Cheilanthes sieberi ssp.	3
Chrysocephalum semipapposum	3
Cymbopogon ambiguus	3
Digitaria brownii	3
Geijera linearifolia	3
Gnephosis tenuissima	3
Gramineae sp.	3
Pittosporum angustifolium	3
Prostanthera striatiflora	3
Santalum lanceolatum	3
Sclerolaena lanicuspis	3
Sclerolaena tricuspis	3
Sida fibulifera	3
Sonchus oleraceus	3
Triodia sp.	3
Vittadinia gracilis	3
Acacia carneorum	2
Alectryon oleifolius ssp. canescens	2
Atriplex angulata	2
Atriplex limbata	2
Atriplex semibaccata	2
Austrostipa trichophylla	2
Boerhavia dominii	2
Chamaesyce drummondii	2
Cheilanthes lasiophylla	2
Chenopodium pumilio	2
Eremophila duttonii	2
Eremophila freelingii	2
Eremophila longifolia	2
Eucalyptus camaldulensis var. camaldulensis	2
Eucalyptus porosa	2

Gnephosis arachnoidea	2
Hypochaeris glabra	2
Maireana aphylla	2
Myoporum platycarpum ssp. platycarpum	2
Nicotiana velutina	2
Osteocarpum salsuginosum	2
Rhagodia ulicina	2
Sclerolaena divaricata	2
Senna artemisioides ssp. petiolaris	2
Solanum sturtianum	2
Stellaria filiformis	2
Amyema linophylla ssp. orientale	1
Amyema miquelii	1
Amyema quandang var. quandang	1
Anagallis arvensis	1
Atriplex acutibractea ssp. acutibractea	1
Atriplex lindleyi ssp. inflata	1
Atriplex sp.	1
Austrodanthonia setacea	1
Austrostipa sp.	1
Brachyscome lineariloba	1
Bulbine alata	1
Bulbine semibarbata	1
Calandrinia eremaea	1
Carrichtera annua	1
Cheilanthes austrotenuifolia	1
Cheilanthes sieberi ssp. sieberi	1
Chenopodium curvispicatum	1
Chenopodium nitrariaceum	1
Crassula colorata var. acuminata	1
Cyperus gymnocaulos	1
Daucus glochidiatus	1
Dissocarpus biflorus var. biflorus	1
Echium plantagineum	1
Enchylaena tomentosa var.	1
Eragrostis setifolia	1
Eremophila alternifolia	1
Eremophila deserti	1
Eucalyptus socialis ssp.	1
Euphorbia tannensis ssp. eremophila	1
Glycine rubiginosa	1
Gypsophila tubulosa	1
Halosarcia indica ssp. leiostachya	1
Halosarcia pergranulata ssp. pergranulata	1
Heliotropium europaeum	1
Maireana integra	1
Maireana sedifolia	1
Marsdenia australis	1
Melaleuca lanceolata	1
Myoporum montanum	1
Osteocarpum acropterum var. acropterum	1
Oxalis perennans	1
Pimelea simplex ssp. simplex	1
Plantago bellardii	1
Plantago hispida	1
Podolepis capillaris	1
Pterocaulon sphacelatum	1
Salvia verbenaca form	1

Sarcostemma viminale ssp. australe	1
Schinus molle	1
Scleranthus pungens	1
Sclerolaena convexula	1
Sclerolaena sp.	1
Sclerolaena ventricosa	1
Senecio pinnatifolius	1
Spergularia sp.	1
Stenopetalum lineare	1
Triodia irritans	1
Vittadinia cuneata var.	1
Vittadinia cuneata var. cuneata forma cuneata	1
Vittadinia dissecta var. hirta	1
Wahlenbergia gracilenta	1

Table 3 lists the introduced species found on the survey with the frequency of their occurrence.

Table 3 : Introduced Species Recorded

SPECIES	FREQUENCY
Anagallis arvensis	1
Asphodelus fistulosus	3
Carrichtera annua	1
Carthamus lanatus	4
Centaurea melitensis	8
Echium plantagineum	1
Gypsophila tubulosa	1
Heliotropium europaeum	1
Hypochaeris glabra	2
Lycium ferocissimum	4
Plantago bellardii	1
Salvia verbenaca form	1
Schinus molle	1
Schismus barbatus	12
Silene apetala	4
Sisymbrium erysimoides	9
Sonchus oleraceus	3
Spergularia sp.	1

Floristic Mapping

The floristic analysis identified 14 mapping groups. A further 2 mapping groups were added during the mapping process based on field observations that had no representative survey sites present. These were the *Eucalyptus porosa* Mallee Woodland group and the *Sclerolaena obliquicuspis* Low Shrubland. Figure 4 illustrates the distribution and extent of the final 16 floristic vegetation groups identified during the study.
The membership and details of each mapping group follow. Each group lists the species that had a probability of occurrence of 25% or greater, perennial and annuals. The cover abundance scores of each species at each site is summarised in the column named COV_LIST, with the counts in brackets after the cover code. The cover abundance codes used are adapted from Braun-Blanquet, J. (1956) as follows:-

N not many, 1 - 10 individuals **

T sparsely or very sparsely present; cover very small (less than 5%)

1 plentiful, but of small cover (less than 5%)

2 any number of individuals covering 5 - 25% of the area

3 any number of individuals covering 25 - 50% of the area

4 any number of individuals covering 50 - 75% of the area

5 covering more than 75% of the area

The DOM_LIST column indicated whether the plant species was flagged as the dominant / codominant overstorey, understorey or emergent species at a survey site, with each site having up to 3 overstorey species (O), up to 3 emergent species (E) and up to 5 understorey species (U) flagged. An emergent species is defined as a species that emerges above the dominant overstorey and has a cover/abundance of less than 5%. The final column, MUIR_LIST indicates the lifeform of the plant species recorded. The full list of muir lifeform codes is shown in Appendix 1.

Each mapping group was also interrogated for structural description, landform pattern, landform element and soil type.

Group 1 : *Acacia aneura* var. (& *A. ayersiana* var. *latifolia* treated as *A. aneura*) over *Acacia tetragonophylla, Dodonaea lobulata, Sida petrophila , Ptilotus obovatus var.obovatus* Very Low Woodland.

MEMBERS : Patchids 22527, 22502, 22505, 12804, 12805, 12806, 12807, 12987, 12809, 12813, 22511

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Acacia tetragonophylla	11	11	92	T(3), 2(3), 1(3), N(2)	o(6), u(1), e(1)	S(8), SA(1), (1), LB(1)
Dodonaea lobulata	11	11	92	1(5), N(4), T(1), 2(1)	u(4), o(1)	SC(9), SB(1), (1)
Sida petrophila	11	11	92	1(6), 2(3), T(2)	u(5)	SD(5), SC(2), SA(2), (1), J(1)
Sisymbrium erysimoides	10	11	83	1(7), T(3)		J(9), (1)
Cheilanthes lasiophylla	9	11	75	1(6), T(2), N(1)		X(9)
Solanum petrophilum	9	11	75	T(6), N(3)	u(1)	SD(8), (1)
Brachyscome lineariloba	8	11	67	1(7), T(1)		J(7), (1)
Tetragonia eremaea	8	11	67	1(6), T(1), 2(1)	u(1)	J(7), (1)
Acacia ayersiana var. *latifolia*	7	11	58	2(3), 1(3), T(1)	o(6)	LB(5), LA(1), (1)
Echium plantagineum	7	11	58	1(3), T(2), N(2)		J(6), (1)
Ptilotus obovatus var.	7	11	58	1(5), T(1), 2(1)	u(6)	SD(7)
Solanum ellipticum/quadriloculatum	7	11	58	1(6), T(1)	u(1)	SD(6), (1)

Abutilon fraseri	6	11	50	1(4), T(2)		SD(3), J(2), (1)
Enchylaena tomentosa var.	6	11	50	T(3), N(2), 1(1)		SD(6)
Isoetopsis graminifolia	6	11	50	1(6)		J(5), (1)
Rhodanthe moschata	6	11	50	1(6)		J(5), (1)
Aristida nitidula	5	11	42	1(3), T(1), N(1)		GL(4), (1)
Cheilanthes sieberi ssp. *sieberi*	5	11	42	1(5)		X(5)
Cymbopogon ambiguus	5	11	42	N(2), 1(2), T(1)		GL(3), GT(1), (1)
Hypochaeris glabra	5	11	42	1(3), T(1), N(1)		J(4), (1)
Lepidium papillosum	5	11	42	T(3), N(1), 1(1)		J(5)
Oxalis perennans	5	11	42	1(2), T(1), N(1), (1)		J(5)
Portulaca oleracea	5	11	42	T(4), N(1)		J(4), (1)
Ptilotus obovatus var. *obovatus*	5	11	42	1(3), T(1), 2(1)	u(2)	SD(4), (1)
Acacia aneura var.	4	11	33	N(2), 2(2)	o(2), e(1)	LB(2), SC(1), LA(1)
Calotis hispidula	4	11	33	1(3), (1)		J(4)
Enchylaena tomentosa var. *tomentosa*	4	11	33	N(2), 1(2)	u(1)	SD(3), (1)
Enneapogon avenaceus	4	11	33	T(2), 1(2)		GL(3), (1)
Erodium cicutarium	4	11	33	1(4)		J(4)
Erodium cygnorum ssp. *glandulosum*	4	11	33	T(3), 1(1)		J(4)
Glycine clandestina var.	4	11	33	N(4)		V(4)
Prostanthera striatiflora	4	11	33	T(2), N(2)		SD(2), SC(1), (1)
Sclerolaena diacantha	4	11	33	2(2), 1(2)	u(2)	SD(4)
Setaria constricta	4	11	33	1(4)		GL(3), (1)
Solanum ellipticum	4	11	33	T(3), 1(1)		SD(4)
Asphodelus fistulosus	3	11	25	T(3)		J(2), (1)
Austrostipa nitida	3	11	25	T(2), 1(1)		GL(3)
Centaurea melitensis	3	11	25	T(2), (1)		J(3)
Chamaesyce drummondii	3	11	25	T(1), N(1), (1)		J(3)
Daucus glochidiatus	3	11	25	1(3)		J(3)
Digitaria brownii	3	11	25	T(1), N(1), 1(1)		GL(3)
Erodium aureum	3	11	25	1(3)		J(2), (1)
Erodium cygnorum ssp. *cygnorum*	3	11	25	1(3)		J(2), (1)
Geococcus pusillus	3	11	25	1(3)		J(3)
Maireana pyramidata	3	11	25	N(2), 1(1)	u(1)	SD(1), SC(1), SA(1)
Medicago minima var. *minima*	3	11	25	1(2), 2(1)		J(2), (1)
Parietaria debilis	3	11	25	1(3)		J(3)
Senecio anethifolius	3	11	25	1(2), N(1)	u(1)	SD(1), SB(1), (1)
Vittadinia gracilis	3	11	25	T(2), (1)		J(3)

Structural Description	**FRQ**
Very Low Woodland	5
Very Low Open Woodland	2
Low Open Woodland	1
Tall Open Shrubland	2
Shrubland	1

Landform Pattern	FRQ
Low Hills	7
Hills	3
Mountains	1

Landform Element	FRQ
Hill Slope	9
Hill Crest	1
Rock Outcrop on Hill	1

Soil Type	FRQ
Sandy Clay Loam	3
Sand	1
Clay loam, Sandy	2
Sandy Loam	5

Group 2 : *Acacia carneorum* over *Maireana pyramidata, Enchylaena tomentosa* var. *tomentosa* +/- *Enneapogon cylindricus* +/- *Tetragonia eremaea* Open Shrubland

MEMBERS : Patchids 22534, 22529, 12808

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Maireana pyramidata	5	3	125	N(3), 2(1), 1(1)	u(2)	SC(3), SD(1), (1)
Acacia carneorum	4	3	100	2(2), 1(2)	o(3)	S(1), SA(1), (1), LB(1)
Lysiana exocarpi ssp. *exocarpi*	4	3	100	1(3), T(1)		MI(4)
Enchylaena tomentosa var. *tomentosa*	3	3	75	T(1), N(1), 1(1)		SD(2), (1)
Gnephosis tenuissima	3	3	75	T(1), N(1), (1)		J(3)
Schismus barbatus	3	3	75	T(2), (1)		GL(3)
Alectryon oleifolius ssp. *canescens*	2	3	50	N(2)		LB(1), (1)
Austrostipa sp.	2	3	50	N(2)		GL(1), (1)
Echium plantagineum	2	3	50	1(2)		J(1), (1)
Enneapogon cylindricus	2	3	50	2(2)	u(1)	GL(1), (1)
Rhagodia spinescens	2	3	50	T(1), N(1)		SC(1), SB(1)
Tetragonia eremaea	2	3	50	2(2)	u(1)	J(1), (1)
Acacia victoriae ssp. *victoriae*	1	3	25	N(1)		S(1)
Actinobole uliginosum	1	3	25	T(1)		J(1)
Aristida nitidula	1	3	25	T(1)		GL(1)
Atriplex angulata	1	3	25	T(1)		SD(1)
Atriplex vesicaria ssp.	1	3	25	T(1)		SD(1)
Austrostipa scabra ssp. *falcata*	1	3	25	(1)		GL(1)
Calotis hispidula	1	3	25	T(1)		J(1)
Chamaesyce drummondii	1	3	25	(1)		J(1)
Enchylaena tomentosa var.	1	3	25	1(1)		S(1)

Hypochaeris glabra	1	3	25	(1)		J(1)
Olearia pimeleoides ssp.	1	3	25	T(1)		SD(1)
Pittosporum angustifolium	1	3	25	T(1)		LB(1)
Salsola kali	1	3	25	(1)		SD(1)
Senna artemisioides ssp. *petiolaris*	1	3	25	N(1)		S(1)

Structural Description	**FRQ**
Tall Open Shrubland	1
Open Shrubland	1
Very Low Open Woodland	1

Landform Pattern	**FRQ**
Plain	1
Dunefield	1
Alluvial Plain	1

Landform Element	**FRQ**
Plain	2
Sandy Plain	1

Soil Type	**FRQ**
Clayey Sand	1
Sandy Loam	1
Loamy Sand	1

Group 3: *Acacia victoriae* ssp. *victoriae* over *Sclerolaena patenticuspis, Maireana pyramidata, Enchylaena tomentosa var. tomentosa* and *Rhagodia spinescens* Tall Very Open Shrubland

MEMBERS : Patchids 22515, 22517

SPECIES	FRQ _SP	NUM_ SITES	PROB _SP	COV_LIST	DOM_ LIST	MUIR_LIS T
Acacia victoriae ssp. *victoriae*	2	2	100	2(2)	o(2)	S(2)
Enchylaena tomentosa var. *tomentosa*	2	2	100	T(1), 1(1)		SD(2)
Lysiana exocarpi ssp. exocarpi	2	2	100	T(1), N(1)		MI(2)
Maireana pyramidata	2	2	100	N(1), 1(1)	u(1)	SC(2)
Rhagodia spinescens	2	2	100	T(2)	u(1)	SD(1), SC(1)
Sclerolaena patenticuspis	2	2	100	2(1), 1(1)	u(2)	SD(2)
Alectryon oleifolius ssp. *canescens*	1	2	50	N(1)		LB(1)
Atriplex angulata	1	2	50	T(1)		SD(1)
Dissocarpus paradoxus	1	2	50	T(1)		SD(1)
Enneapogon avenaceus	1	2	50	T(1)		GL(1)
Eremophila longifolia	1	2	50	N(1)		SD(1)
Eremophila sturtii	1	2	50	N(1)		S(1)
Heliotropium europaeum	1	2	50	N(1)		J(1)
Lycium ferocissimum	1	2	50	N(1)		SA(1)
Maireana aphylla	1	2	50	N(1)		SD(1)
Maireana brevifolia	1	2	50	T(1)		SC(1)
Olearia pimeleoides ssp. *pimeleoides*	1	2	50	N(1)		SC(1)
Ptilotus obovatus var.	1	2	50	N(1)		SD(1)
Salsola kali	1	2	50	N(1)		SD(1)
Santalum lanceolatum	1	2	50	T(1)	e(1)	LB(1)
Schismus barbatus	1	2	50	T(1)		GL(1)
Sida petrophila	1	2	50	T(1)		SD(1)

Solanum ellipticum	1	2	50	N(1)		SD(1)
Solanum petrophilum	1	2	50	N(1)		J(1)

Structural Description	**FRQ**
Tall Very Open Shrubland	2

Landform Pattern	**FRQ**
Plain	2

Landform Element	**FRQ**
Clay Plain	1
Plain	1

Soil Type	**FRQ**
Sandy Clay Loam	1
Loamy Sand	1

Group 4: *Alectryon oleifolius* ssp. *canescens* over *Sclerolaena patenticuspis*, +/- *Enchylaena tomentosa* var. *tomentosa* and *Tetragonia eremaea* Very Low Woodland

MEMBERS : 12810, 22518

SPECIES	FRQ_SP	NUM_ SITES	PROB-SP	COV_LIST	DOM_ LIST	MUIR_LIST
Alectryon oleifolius ssp. *canescens*	2	2	100	2(1), 1(1)	o(2)	LB(2)
Calotis hispidula	2	2	100	T(1), 1(1)		J(2)
Schismus barbatus	2	2	100	T(1), 1(1)		GL(2)
Sclerolaena patenticuspis	2	2	100	T(1), 1(1)	u(1)	SD(1), SC(1)
Actinobole uliginosum	1	2	50	T(1)		J(1)
Atriplex acutibractea ssp. *acutibractea*	1	2	50	N(1)		J(1)
Atriplex limbata	1	2	50	T(1)		SD(1)
Brachyscome lineariloba	1	2	50	1(1)		J(1)
Casuarina pauper	1	2	50	N(1)		LB(1)
Crassula colorata var. *acuminata*	1	2	50	T(1)		J(1)
Crassula sieberiana ssp. *tetramera*	1	2	50	1(1)		J(1)
Daucus glochidiatus	1	2	50	1(1)		J(1)
Echium plantagineum	1	2	50	2(1)	u(1)	J(1)
Enchylaena tomentosa var.	1	2	50	N(1)		SD(1)
Enneapogon avenaceus	1	2	50	T(1)		GL(1)
Geococcus pusillus	1	2	50	1(1)		J(1)
Gnephosis arachnoidea	1	2	50	N(1)		J(1)
Gnephosis tenuissima	1	2	50	T(1)		J(1)
Harmsiodoxa blennodioides	1	2	50	1(1)		J(1)
Lemooria burkittii	1	2	50	1(1)		J(1)
Lysiana exocarpi ssp. *exocarpi*	1	2	50	1(1)		MI(1)

Olearia pimeleoides ssp. *pimeleoides*	1	2	50	N(1)		SD(1)
Ptilotus sp.	1	2	50	1(1)		J(1)
Rhodanthe moschata	1	2	50	1(1)		J(1)
Rhodanthe pygmaea	1	2	50	1(1)		J(1)
Setaria constricta	1	2	50	N(1)		GL(1)
Sisymbrium erysimoides	1	2	50	1(1)		J(1)
Tetragonia eremaea	1	2	50	2(1)	u(1)	J(1)

Structural Description	**FRQ**
Very Low Woodland	2

Landform Pattern	**FRQ**
Plain	1
Alluvial Plain	1

Landform Element	**FRQ**
Plain	2

Soil Type	**FRQ**
Clay loam, Sandy	1
Sandy Loam	1

Group 5 : *Callitris glaucophylla* +/- *Eucalyptus porosa* over *Dodonaea viscosa* ssp. *angustissima, Sida petrophila, Cassinia laevis, Ptilotus obovatus* var. *obovatus* Low Open Woodland

MEMBERS : 22521, 22509, 22512

SPECIES	FRQ _SP	NUM_ SITES	PROB _SP	COV_LIST	DOM_ LIST	MUIR_LIST
Abutilon leucopetalum	3	3	100	T(2), (1)		SD(3),
Callitris glaucophylla	3	3	100	2(3)	o(3)	LB(2), LA(1)
Cassinia laevis	3	3	100	1(2), N(1)	u(1)	SD(1), SC(1), SB(1)
Dodonaea viscosa ssp. *angustissima*	3	3	100	N(2), T(1)		SC(3)
Ptilotus obovatus var. *obovatus*	3	3	100	1(2), N(1)	u(1)	SD(3)
Sida petrophila	3	3	100	1(2), T(1)	u(2)	SD(3)
Solanum petrophilum	3	3	100	T(2), N(1)		SD(2), J(1)
Centaurea melitensis	2	3	67	1(1), (1)		J(2)
Cymbopogon ambiguus	2	3	67	T(1), 1(1)		GL(2)
Leiocarpa semicalva ssp. *semicalva*	2	3	67	T(2)		SD(2)
Lepidium papillosum	2	3	67	T(2)		J(2)
Sclerolaena divaricata	2	3	67	T(2)		SD(2)
Sisymbrium erysimoides	2	3	67	1(2)		J(2)
Acacia tetragonophylla	1	3	33	N(1)		SC(1)
Aristida holathera var. *holathera*	1	3	33	T(1)		GL(1)
Austrostipa trichophylla	1	3	33	T(1)		GL(1)
Brachycome ciliaris var.	1	3	33	T(1)		SD(1)
Carthamus lanatus	1	3	33	T(1)		J(1)
Cheilanthes austrotenuifolia	1	3	33	T(1)		X(1)
Cheilanthes sieberi ssp.	1	3	33	T(1)		X(1)
Chrysocephalum semipapposum	1	3	33	T(1)		J(1)

Daucus glochidiatus	1	3	33	T(1)		J(1)
Dissocarpus paradoxus	1	3	33	N(1)		SD(1)
Dodonaea lobulata	1	3	33	T(1)		SC(1)
Enchylaena tomentosa var. *tomentosa*	1	3	33	T(1)		SD(1)
Eremophila freelingii	1	3	33	T(1)		SD(1)
Eucalyptus porosa	1	3	33	2(1)	o(1)	KT(1)
Gramineae sp.	1	3	33	T(1)		GL(1)
Marsdenia australis	1	3	33	N(1)		V(1)
Nicotiana velutina	1	3	33	T(1)		J(1)
Oxalis perennans	1	3	33	T(1)		SD(1)
Prostanthera striatiflora	1	3	33	N(1)		SD(1)
Sarcostemma viminale ssp. *australe*	1	3	33	N(1)		SB(1)
Schismus barbatus	1	3	33	T(1)		GL(1)
Scleranthus pungens	1	3	33	T(1)		SD(1)
Sclerolaena obliquicuspis	1	3	33	1(1)		SD(1)
Silene apetala	1	3	33	T(1)		J(1)
Solanum ellipticum	1	3	33	T(1)		SD(1)
Sonchus oleraceus	1	3	33	N(1)		J(1)

Structural Description	**FRQ**
Low Woodland	1
Low Open Woodland	1
Very Low Open Woodland	1

Landform Pattern	**FRQ**
Hills	3

Landform Element	**FRQ**
Hill Slope	3

Soil Type	**FRQ**
Sandy Clay Loam	1
Clayey Sand	1
Clay loam, Sandy	1

Group 6 : *Casuarina pauper* over *Maireana pyramidata, Maireana appressa +/- Atriplex vesicaria* ssp. Low Open Forest

MEMBERS : 22507, 22514

SPECIES	FRQ _SP	NUM_ SITES	PROB _SP	COV_LIST	DOM_ LIST	MUIR_LIS T
Casuarina pauper	2	2	100	3(2)	o(2)	LA(2)
Enchylaena tomentosa var. *tomentosa*	2	2	100	1(2)		SD(2)
Maireana appressa	2	2	100	1(2)		SD(2)
Maireana pyramidata	2	2	100	T(1), 2(1)	u(1)	SC(2)
Rhagodia spinescens	2	2	100	T(1), N(1)		SD(2)
Sclerolaena diacantha	2	2	100	T(1), 1(1)		SD(2)
Acacia victoriae ssp.	1	2	50	N(1)		SD(1)
Amyema linophylla ssp. *orientale*	1	2	50	1(1)		MI(1)
Atriplex vesicaria ssp.	1	2	50	1(1)	u(1)	SD(1)
Chenopodium curvispicatum	1	2	50	T(1)		SD(1)
Dissocarpus biflorus var. *biflorus*	1	2	50	1(1)		SD(1)
Dissocarpus paradoxus	1	2	50	T(1)		SD(1)
Dodonaea lobulata	1	2	50	N(1)		SC(1)
Dodonaea viscosa ssp. *angustissima*	1	2	50	N(1)		SB(1)
Eremophila deserti	1	2	50	N(1)		SC(1)
Eremophila sturtii	1	2	50	2(1)	u(1)	SC(1)
Glycine rubiginosa	1	2	50	N(1)		SD(1)
Maireana aphylla	1	2	50	N(1)		SD(1)
Maireana astrotricha	1	2	50	1(1)		SD(1)
Myoporum platycarpum ssp.	1	2	50	N(1)		LA(1)
Olearia pimeleoides ssp.	1	2	50	N(1)		SD(1)
Ptilotus obovatus var.	1	2	50	T(1)		SD(1)

Salsola kali	1	2	50	T(1)		SD(1)
Sclerolaena brachyptera	1	2	50	1(1)		SD(1)
Sclerolaena lanicuspis	1	2	50	1(1)		SD(1)
Sclerolaena sp.	1	2	50	1(1)		SD(1)
Sclerolaena tricuspis	1	2	50	1(1)		SD(1)

Structural Description	**FRQ**
Low Open Forest	2

Landform Pattern	**FRQ**
Plain	2

Landform Element	**FRQ**
Plain	2

Soil Type	**FRQ**
Sandy Clay Loam	1
Clayey Sand	1

Group 7 : *Dodonaea viscosa* ssp. *angustissima +/- Eremophila sturtii* over *Rhagodia spinescens +/- Maireana pyramidata* Open Shrubland

MEMBERS : 22524, 22516, 22519, 12819, 22528, 12984

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COVLIST	DOMLIST	MUIRLIST
Rhagodia spinescens	5	6	83	N(3), T(1), 1(1)	u(2)	SD(4), SC(1)
Dodonaea viscosa ssp. *angustissima*	4	6	67	1(2), T(1), 2(1)	o(4)	SB(1), SC(1), S(1), SA(1)
Maireana pyramidata	4	6	67	2(2), 1(2)	u(3), o(1)	SC(3), SD(1)
Atriplex limbata	3	6	50	T(2), 1(1)		J(2), SD(1)
Eremophila sturtii	3	6	50	2(3)	o(3)	S(2), SA(1)
Olearia pimeleoides ssp. *pimeleoides*	3	6	50	T(2), 1(1)		SD(3)
Schismus barbatus	3	6	50	T(3)		GL(3)
Acacia victoriae ssp. *victoriae*	2	6	33	T(1), N(1)		SB(1), S(1)
Actinobole uliginosum	2	6	33	T(1), 1(1)		J(2)
Atriplex vesicaria ssp.	2	6	33	N(1), 1(1)		SD(2)
Calotis hispidula	2	6	33	1(2)		J(2)
Enchylaena tomentosa var. *tomentosa*	2	6	33	T(1), N(1)		SD(2)
Gnephosis arachnoidea	2	6	33	T(2)		J(2)
Lepidium papillosum	2	6	33	T(2)		J(2)
Lysiana exocarpi ssp. *exocarpi*	2	6	33	T(2)		MI(2)
Salsola kali	2	6	33	N(2)		SD(1), J(1)
Sisymbrium erysimoides	2	6	33	T(1), 1(1)		J(2)
Solanum petrophilum	2	6	33	T(1), N(1)		SD(1), J(1)
Tetragonia eremaea	2	6	33	T(1), 2(1)	u(1)	J(2)

Landform Pattern	FRQ
Plateau	1
Plain	4
Alluvial Plain	1

Landform Element	FRQ
Plain	4
Fllod Out	1
Rock Outcrop on Hill	1

Soil Type	FRQ
Clayey Sand	1
Silty Clay Loam	1
Clay loam, Sandy	1
Sandy Loam	2
Sandy Clay Loam	1

Group 9 : *Eucalyptus camaldulensis* var. *camaldulensis* over *Enchylaena tomentosa* var. *tomentosa, Cymbopogon ambiguus, Solanum sturtianum +/-Maireana brevifolia* Open Forest

MEMBERS : 22510, 22508, 12811

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Abutilon leucopetalum	3	3	75	N(2), T(1)		SD(2), (1)
Chamaesyce drummondii	3	3	75	1(2), T(1)		SD(1), J(1), (1)
Cymbopogon ambiguus	3	3	75	1(3)	u(1)	GT(2), (1)
Dodonaea lobulata	3	3	75	N(3)		SD(1), SC(1), (1)
Enchylaena tomentosa var. *tomentosa*	3	3	75	T(1), 2(1), 1(1)	u(1)	SC(2), (1)
Pterocaulon sphacelatum	3	3	75	N(2), 1(1)		SD(1), J(1), (1)
Solanum sturtianum	3	3	75	1(2), T(1)	u(1)	SC(2), (1)
Acacia victoriae ssp. *victoriae*	2	3	50	T(1), N(1)		SC(1), (1)
Aristida holathera var. *holathera*	2	3	50	1(2)		GT(1), (1)
Asphodelus fistulosus	2	3	50	1(1), (1)		J(2)
Austrodanthonia caespitosa	2	3	50	1(2)		GL(1), (1)
Austrostipa acrociliata	2	3	50	T(2)		GL(1), (1)
Brachyscome lineariloba	2	3	50	T(2)		J(1), (1)
Carrichtera annua	2	3	50	N(2)		J(1), (1)
Convolvulus remotus	2	3	50	T(2)		V(2)
Dissocarpus paradoxus	2	3	50	2(1), 1(1)		SD(2)
Echium plantagineum	2	3	50	T(2)		J(1), (1)
Enneapogon avenaceus	2	3	50	1(2)		GL(1), (1)
Enteropogon acicularis	2	3	50	1(2)		GL(1), (1)

Eragrostis dielsii var. *dielsii*	2	3	50	1(2)		GL(1), (1)
Eremophila sturtii	2	3	50	T(2)		SC(1), (1)
Eucalyptus camaldulensis var.	2	3	50	3(2)	o(1)	M(1), (1)
Eucalyptus camaldulensis var. *camaldulensis*	2	3	50	3(1), 2(1)	o(2)	M(2)
Galium murale	2	3	50	1(2)		J(1), (1)
Hypochaeris glabra	2	3	50	T(2)		J(1), (1)
Maireana brevifolia	2	3	50	3(1), 1(1)	u(1)	SC(2)
Malva parviflora	2	3	50	N(2)		J(1), (1)
Olearia pimeleoides ssp. *pimeleoides*	2	3	50	N(2)		SD(1), (1)
Rhagodia spinescens	2	3	50	T(1), 2(1)		SD(1), SC(1)
Salvia verbenaca var. *verbenaca*	2	3	50	N(2)		J(1), (1)
Sclerolaena obliquicuspis	2	3	50	T(1), 1(1)		SD(2)
Sclerolaena patenticuspis	2	3	50	N(2)		SD(1), (1)
Sida sp.	2	3	50	T(2)		SD(1), (1)
Sisymbrium erysimoides	2	3	50	T(1),		J(2)
Solanum petrophilum	2	3	50	T(2)		SD(1), SC(1)
Tetragonia eremaea	2	3	50	1(2)		J(1), (1)
Themeda triandra	2	3	50	1(2)		GT(1), (1)
Acacia victoriae ssp.	1	3	25	T(1)		SD(1)
Ajuga australis form	1	3	25	(1)		J(1)
Anagallis arvensis	1	3	25	(1)		(1)
Atriplex limbata	1	3	25	N(1)		SC(1)
Atriplex lindleyi ssp. *inflata*	1	3	25	1(1)		SD(1)
Brachyscome ciliaris var. *lanuginosa*	1	3	25	(1)		J(1)
Calotis hispidula	1	3	25	(1)		J(1)
Centaurea melitensis	1	3	25	(1)		J(1)
Centipeda sp.	1	3	25	(1)		(1)
Cullen australasicum	1	3	25	(1)		(1)
Cyperus gymnocaulos	1	3	25	1(1)		VL(1)
Enchylaena tomentosa var.	1	3	25	T(1)		SD(1)
Eucalyptus porosa	1	3	25	N(1)		KT(1)
Glycine clandestina var.	1	3	25	(1)		V(1)
Harmsiodoxa brevipes var. *brevipes*	1	3	25	(1)		(1)
Leiocarpa websteri	1	3	25	(1)		(1)
Lotus cruentus	1	3	25	(1)		J(1)
Lycium ferocissimum	1	3	25	N(1)		SB(1)
Maireana astrotricha	1	3	25	N(1)		SD(1)
Maireana pyramidata	1	3	25	N(1)		SC(1)
Medicago minima var. *minima*	1	3	25	(1)		J(1)
Melaleuca lanceolata	1	3	25	N(1)		S(1)
Myoporum montanum	1	3	25	N(1)		SA(1)
Onopordum acaulon	1	3	25	(1)		P(1)
Osteocarpum salsuginosum	1	3	25	T(1)		SD(1)
Pimelea simplex ssp.	1	3	25	(1)		J(1)
Ptilotus obovatus var.	1	3	25	T(1)		SD(1)
Ptilotus obovatus var. *obovatus*	1	3	25	(1)		SD(1)
Pycnosorus pleiocephalus	1	3	25	(1)		(1)
Rhodanthe microglossa	1	3	25	(1)		(1)
Rhodanthe moschata	1	3	25	(1)		(1)
Rhodanthe pygmaea	1	3	25	(1)		(1)
Schinus molle	1	3	25	(1)		LB(1)
Schismus barbatus	1	3	25	1(1)		GL(1)
Sclerolaena lanicuspis	1	3	25	T(1)		SD(1)
Senecio anethifolius	1	3	25	(1)		SC(1)
Sida petrophila	1	3	25	1(1)		SC(1)
Silene apetala	1	3	25	(1)		(1)

Sonchus oleraceus	1	3	25	(1)		J(1)
Swainsona phacoides	1	3	25	(1)		(1)
Vittadinia gracilis	1	3	25	(1)		J(1)
Wahlenbergia communis	1	3	25	(1)		J(1)

Structural Description	**FRQ**
Woodland	1
Open Forest	2

Landform Pattern	**FRQ**
Flood Plain	2
Hills	
Mountains	

Landform Element	**FRQ**
Plain	1
Stream Bed	1
Stream Channel	1

Soil Type	**FRQ**
Sand	2
Clayey Sand	1

Group 10 : *Eucalyptus socialis* ssp. over *Dissocarpus paradoxus* Mallee

MEMBERS : 22532

SPECIES	FRQ_SP	NUM_ SITES	PROB _SP	COV_LIST	DOM_ LIST	MUIR_LIS T
Acacia oswaldii	1	1	100	N(1)		SD(1)
Austrostipa nitida	1	1	100	N(1)		GL(1)
Dissocarpus paradoxus	1	1	100	1(1)	u(1)	SD(1)
Eucalyptus socialis ssp.	1	1	100	3(1)	o(1)	KT(1)
Maireana pyramidata	1	1	100	N(1)		SD(1)
Myoporum platycarpum ssp. *platycarpum*	1	1	100	N(1)		LB(1)
Sclerolaena brachyptera	1	1	100	T(1)		SD(1)
Sclerolaena obliquicuspis	1	1	100	1(1)		SD(1)

Structural Description	FRQ
Mallee	1

Landform Pattern	FRQ
Rise	1

Landform Element	FRQ
Hill Slope	1

Soil Type	FRQ
Sandy Loam	1

Group 11 : *Atriplex vesicaria* ssp. +/- *Maireana astrotricha* +/- *Rhagodia spinescens* over *Sclerolaena obliquicuspis* Low Open Shrubland

MEMBERS : 22500, 12982, 12986, 13034, 13035

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Atriplex vesicaria ssp.	5	5	100	2(4), 1(1)	o(5)	SD(5)
Brachyscome lineariloba	4	5	80	T(2), 1(2)		J(4)
Calotis hispidula	4	5	80	1(4)		J(4)
Plantago drummondii	4	5	80	T(2), 1(2)		J(4)
Rhodanthe moschata	4	5	80	T(2), 1(2)		J(4)
Schismus barbatus	4	5	80	1(3), T(1)		GL(4)
Sclerolaena obliquicuspis	4	5	80	1(2), N(1), 2(1)	u(2)	SD(4)
Tetragonia eremaea	4	5	80	1(2), T(1), 2(1)		J(4)
Austrostipa nitida	3	5	60	T(2), 1(1)		GL(3)
Centaurea melitensis	3	5	60	T(2), 1(1)		J(3)
Daucus glochidiatus	3	5	60	T(3)		J(3)
Harmsiodoxa brevipes var.	3	5	60	T(2), 1(1)		J(3)
Maireana astrotricha	3	5	60	2(2), 1(1)	o(3)	SD(3)
Pycnosorus pleiocephalus	3	5	60	T(2), 1(1)		J(3)
Rhagodia spinescens	3	5	60	T(1), N(1), 1(1)	o(1)	SD(1), SC(1), SB(1)
Rhodanthe pygmaea	3	5	60	1(3)		J(3)
Sclerolaena sp.	3	5	60	1(3)	u(1)	SD(3)
Sonchus oleraceus	3	5	60	T(3)		J(3)
Acacia victoriae ssp.	2	5	40	N(2)	e(2)	SA(1), S(1)
Alyssum linifolium	2	5	40	T(2)		J(2)
Asphodelus fistulosus	2	5	40	T(1), 1(1)		J(2)
Bulbine semibarbata	2	5	40	T(1), 1(1)		J(2)

Carthamus lanatus	2	5	40	1(2)		J(2)
Crassula sp.	2	5	40	T(2)		J(2)
Dissocarpus biflorus var.	2	5	40	T(1), 1(1)		SD(2)
Enneapogon avenaceus	2	5	40	1(2)	u(1)	GL(2)
Gnephosis arachnoidea	2	5	40	1(2)	u(1)	J(2)
Goodenia fascicularis	2	5	40	T(1), 1(1)		J(2)
Lotus cruentus	2	5	40	T(2)		J(2)
Maireana aphylla	2	5	40	N(2)	e(1)	SC(1), SB(1)
Maireana appressa	2	5	40	T(1), N(1)		SD(2)
Maireana pyramidata	2	5	40	N(1), 1(1)		SD(2)
Minuria integerrima	2	5	40	T(1), N(1)		SD(2)
Rhodanthe polygalifolia	2	5	40	T(2)		J(2)
Stenopetalum lineare	2	5	40	1(2)		J(2)
'unverified species - nv`	1	5	20	N(1)		SD(1)
Actinobole uliginosum	1	5	20	T(1)		J(1)
Amyema miraculosa ssp. *boormanii*	1	5	20	N(1)		M(1)
Aristida nitidula	1	5	20	T(1)	u(1)	GL(1)
Atriplex holocarpa	1	5	20	1(1)		J(1)
Austrodanthonia caespitosa	1	5	20	T(1)		GL(1)
Bromus arenarius	1	5	20	T(1)		GL(1)
Calotis cymbacantha	1	5	20	T(1)		J(1)
Carrichtera annua	1	5	20	T(1)		J(1)
Convolvulus remotus	1	5	20	T(1)		V(1)
Crassula colorata var.	1	5	20	T(1)		J(1)
Eremophila sturtii	1	5	20	N(1)	e(1)	SA(1)
Eriochiton sclerolaenoides	1	5	20	T(1)	u(1)	SD(1)
Erodium cicutarium	1	5	20	T(1)		J(1)
Erodium crinitum	1	5	20	T(1)		J(1)
Erodium cygnorum ssp. *cygnorum*	1	5	20	1(1)		J(1)
Erodium cygnorum ssp. *glandulosum*	1	5	20	T(1)		J(1)
Gramineae sp.	1	5	20	1(1)		GL(1)
Leiocarpa websteri	1	5	20	1(1)		SD(1)
Lemooria burkittii	1	5	20	T(1)		J(1)
Leucochrysum molle	1	5	20	T(1)		J(1)
Maireana sedifolia	1	5	20	T(1)		SD(1)
Maireana sp.	1	5	20	T(1)		SD(1)
Medicago polymorpha var. *polymorpha*	1	5	20	T(1)		J(1)
Minuria cunninghamii	1	5	20	T(1)		SD(1)
Olearia pimeleoides ssp.	1	5	20	N(1)		SD(1)
Omphalolappula concava	1	5	20	1(1)		J(1)
Osteocarpum acropterum var. *acropterum*	1	5	20	T(1)		SD(1)
Pimelea simplex ssp. *simplex*	1	5	20	T(1)		J(1)
Rhagodia ulicina	1	5	20	N(1)		SC(1)
Rhodanthe floribunda	1	5	20	1(1)	u(1)	J(1)
Rhodanthe stricta	1	5	20	T(1)		J(1)
Rostraria pumila	1	5	20	1(1)		GL(1)
Sclerolaena brachyptera	1	5	20	1(1)	u(1)	SD(1)
Sclerolaena decurrens	1	5	20	T(1)		SD(1)
Sclerolaena divaricata	1	5	20	T(1)	u(1)	SD(1)
Sclerolaena lanicuspis	1	5	20	1(1)		SD(1)
Sclerolaena patenticuspis	1	5	20	1(1)	u(1)	SD(1)
Sclerostegia tenuis	1	5	20	T(1)		SD(1)
Senecio anethifolius	1	5	20	N(1)		SC(1)

Senecio glossanthus	1	5	20	T(1)		J(1)
Sida intricata	1	5	20	1(1)	u(1)	J(1)
Sida petrophila	1	5	20	N(1)		S(1)
Sisymbrium erysimoides	1	5	20	T(1)		J(1)
Triodia sp.	1	5	20	T(1)		GL(1)
Vittadinia dissecta var. *hirta*	1	5	20	T(1)		J(1)
Wahlenbergia gracilenta	1	5	20	T(1)		J(1)
Zygophyllum aurantiacum	1	5	20	T(1)		J(1)

Structural Description	**FRQ**
Low Open Shrubland	3
Low Shrubland	2

Landform Pattern	**FRQ**
Low Hill	1
Alluvial Plain	2
Plain	2

Landform Element	**FRQ**
Plain	4
Hill Footslope	1

Soil Type	**FRQ**
Sandy Clay Loam	5

Group 12 : *Maireana pyramidata* over +/- *Sclerolaena patenticuspis*, +/ *Sclerolaena tricuspis* +/- *Tetragonia eremaea* Low Open Shrubland

MEMBERS : 22501, 22530, 22513, 22520, 22503, 12803, 14496, 12983

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Maireana pyramidata	9	8	100	2(5), N(2), 1(2)	o(7), e(1)	SD(4), SC(4), (1)
Acacia victoriae ssp. *victoriae*	5	8	56	N(5)	e(1)	SB(2), SD(1), SC(1), S(1)
Atriplex vesicaria ssp.	4	8	44	2(4)	u(2), o(2)	SD(4)
Schismus barbatus	4	8	44	T(4)		GL(4)
Sclerolaena patenticuspis	4	8	44	T(2), 2(2)	u(2)	SD(4)
Tetragonia eremaea	4	8	44	T(2), 1(2)	u(1)	J(3), (1)
Centaurea melitensis	3	8	33	T(3)		J(3)
Enchylaena tomentosa var. *tomentosa*	3	8	33	T(1), N(1), 1(1)		SD(3)
Gramineae sp.	3	8	33	T(3)		GL(3)
Pimelea simplex ssp. *simplex*	3	8	33	1(3)	u(1)	J(2), (1)
Rhagodia spinescens	3	8	33	T(1), N(1), 1(1)	o(1)	SD(2), SC(1)
Sclerolaena brachyptera	3	8	33	1(2), T(1)		SD(1), J(1), (1)
Sclerolaena lanicuspis	3	8	33	1(3)	u(1)	SD(1), J(1), (1)
Sclerolaena obliquicuspis	3	8	33	N(1), 2(1), 1(1)		SD(3)
Austrostipa nitida	2	8	22	T(2)		GL(2)
Brachyscome ciliaris var. *lanuginosa*	2	8	22	N(1), (1)		J(2)

Calotis hispidula	2	8	22	T(2)		J(2)
Chamaesyce drummondii	2	8	22	N(2)		J(1), (1)
Dissocarpus paradoxus	2	8	22	T(1), 1(1)		SD(2)
Dodonaea viscosa ssp. *angustissima*	2	8	22	N(2)	e(1)	SC(1), S(1)
Enneapogon avenaceus	2	8	22	1(2)	o(1)	GL(1), (1)
Enneapogon cylindricus	2	8	22	1(2)	u(1)	GL(1), (1)
Eremophila sturtii	2	8	22	T(1), (1)	e(1)	S(2)
Goodenia pinnatifida	2	8	22	T(2)		J(2)
Lotus cruentus	2	8	22	N(1), (1)		P(1), J(1)
Maireana appressa	2	8	22	T(1), N(1)		SD(2)
Maireana astrotricha	2	8	22	1(2)		SD(2)
Maireana eriantha	2	8	22	1(2)	o(1)	J(1), (1)
Minuria cunninghamii	2	8	22	N(1), 1(1)		SD(2)
Osteocarpum acropterum var. *acropterum*	2	8	22	T(1), 1(1)		SD(2)
Portulaca oleracea	2	8	22	1(1), (1)		P(1), J(1)
Sclerolaena divaricata	2	8	22	N(1), 2(1)	o(1)	SD(2)
Sclerolaena tricuspis	2	8	22	N(1), 2(1)	u(1)	SD(2)
Solanum ellipticum/quadriloculatum	2	8	22	N(2)		J(1), (1)
Solanum petrophilum	2	8	22	N(2)		J(1), (1)
Sonchus oleraceus	2	8	22	T(1), N(1)		J(2)
Vittadinia gracilis	2	8	22	T(1), (1)		J(2)
Wurmbea dioica ssp. *dioica*	2	8	22	N(2)		J(1), (1)

MUIRCODE	FRQ_GF	NUM_SITES	NUM_VISIT	PROB_GF	COVLIST
GL	2	8	2	100	r(1), i(1)
J	2	8	2	100	i(1), c(1)
SD	2	8	2	100	r(1), i(1)

Landform Pattern	FRQ
Plain	6
Hill	1

Landform Element	FRQ
Plain	6
Hill Slope	1

Soil Type	FRQ
Sandy Clay Loam	2
Clay Loam, Sandy	1
Silty Clay Loam	2
Silty Loam	1
Light Clay	1

Group 13 : *Maireana sedifolia* over *Ptilotus obovatus* var. *obovatus* Low Very Open Shrubland

MEMBERS : 22531

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Acacia victoriae ssp.	1	1	100	N(1)		SD(1)
Asphodelus fistulosus	1	1	100	T(1)		J(1)
Austrostipa nitida	1	1	100	T(1)		GL(1)
Brachyscome lineariloba	1	1	100	T(1)		J(1)
Calotis hispidula	1	1	100	1(1)		J(1)
Carrichtera annua	1	1	100	N(1)		J(1)
Carthamus lanatus	1	1	100	N(1)		J(1)
Chamaesyce drummondii	1	1	100	T(1)		J(1)
Dodonaea lobulata	1	1	100	N(1)		SC(1)
Enneapogon avenaceus	1	1	100	T(1)		GL(1)
Maireana integra	1	1	100	N(1)		SD(1)
Maireana pyramidata	1	1	100	1(1)		SD(1)
Maireana sedifolia	1	1	100	2(1)	o(1)	SD(1)
Ptilotus obovatus var.	1	1	100	1(1)	u(1)	SD(1)
Rhagodia spinescens	1	1	100	N(1)		SC(1)
Salvia verbenaca form	1	1	100	N(1)		J(1)
Sclerolaena diacantha	1	1	100	T(1)		SD(1)
Sclerolaena obliquicuspis	1	1	100	T(1)		SD(1)
Sida fibulifera	1	1	100	N(1)		J(1)
Solanum ellipticum	1	1	100	T(1)		SD(1)
Solanum petrophilum	1	1	100	T(1)		SD(1)
Solanum sturtianum	1	1	100	T(1)		SD(1)
Stenopetalum lineare	1	1	100	T(1)		J(1)
Vittadinia cuneata var.	1	1	100	T(1)		J(1)

Structural Description	FRQ
Low Very Open Shrubland	1

Landform Pattern	FRQ
Hill	1

Landform Element	FRQ
Rock Outcrop on Hill	1

Soil Type	FRQ
Clay Loam, Sandy	1

Group 14: Rhagodia spinescens over Halosarcia pergranulata ssp. pergranulata, Halosarcia indica ssp. leistachya Shrubland

MEMBERS : 22506

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Atriplex semibaccata	1	1	100	1(1)		SD(1)
Atriplex sp.	1	1	100	T(1)		SD(1)
Centaurea melitensis	1	1	100	T(1)		J(1)
Enchylaena tomentosa var. *tomentosa*	1	1	100	1(1)		SC(1)
Eremophila sturtii	1	1	100	N(1)		SC(1)
Halosarcia indica ssp. *leiostachya*	1	1	100	1(1)	u(1)	SC(1)
Halosarcia pergranulata ssp. *pergranulata*	1	1	100	2(1)	u(1)	SD(1)
Maireana brevifolia	1	1	100	1(1)		SC(1)
Osteocarpum salsuginosum	1	1	100	1(1)		SD(1)
Rhagodia spinescens	1	1	100	3(1)	o(1)	SB(1)
Sclerolaena diacantha	1	1	100	T(1)		SD(1)
Sclerolaena patenticuspis	1	1	100	T(1)		SD(1)
Sclerolaena ventricosa	1	1	100	T(1)		SD(1)

Structural Description	FRQ
Shrubland	1

Landform Pattern	FRQ
Plain	1

Landform Element	FRQ
Sandy Plain	1

Soil Type	FRQ
Clay Loam	1

Group 15 : *Triodia irritans* over *Ptilotus obovatus* var. *obovatus, Sida petrophila* Hummock Grassland

MEMBERS : 22504

SPECIES	FRQ_SP	NUM_SITES	PROB_SP	COV_LIST	DOM_LIST	MUIR_LIST
Abutilon leucopetalum	1	1	100	N(1)		SD(1)
Austrostipa sp.	1	1	100	T(1)		GL(1)
Boerhavia dominii	1	1	100	T(1)		SD(1)
Bulbine semibarbata	1	1	100	T(1)		J(1)
Centaurea melitensis	1	1	100	T(1)		J(1)
Cheilanthes sieberi ssp.	1	1	100	T(1)		X(1)
Dodonaea lobulata	1	1	100	T(1)		SD(1)
Dodonaea viscosa ssp. *angustissima*	1	1	100	T(1)		SD(1)
Enchylaena tomentosa var. *tomentosa*	1	1	100	T(1)		SD(1)
Euphorbia tannensis ssp. *eremophila*	1	1	100	N(1)		SD(1)
Geijera linearifolia	1	1	100	1(1)		SD(1)
Leiocarpa semicalva ssp. *semicalva*	1	1	100	T(1)		J(1)
Lepidium papillosum	1	1	100	T(1)		J(1)
Maireana brevifolia	1	1	100	N(1)		SD(1)
Ptilotus obovatus var.	1	1	100	2(1)	u(1)	SD(1)
Sclerolaena diacantha	1	1	100	N(1)		SD(1)
Sida petrophila	1	1	100	1(1)	u(1)	SD(1)
Silene apetala	1	1	100	T(1)		J(1)
Sisymbrium erysimoides	1	1	100	1(1)		J(1)
Solanum ellipticum	1	1	100	1(1)		SD(1)
Solanum petrophilum	1	1	100	N(1)		SD(1)

Triodia irritans	1	1	100	3(1)	o(1)	H(1)
Triodia sp.	1	1	100	T(1)		GL(1)

Structural Description	**FRQ**
Hummock Grassland	1

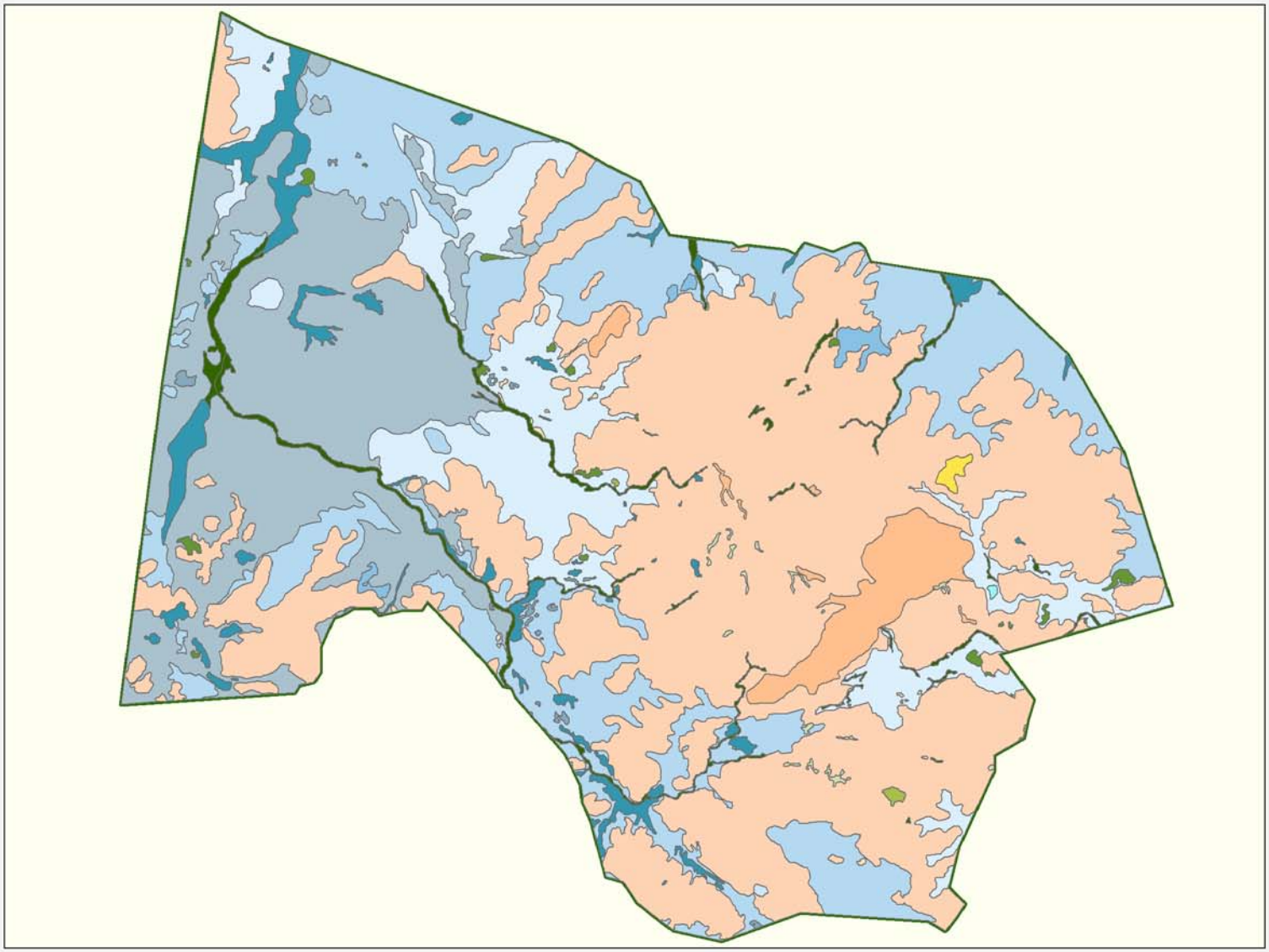
Landform Pattern	**FRQ**
Low Hills	1

Landform Element	**FRQ**
Hill Slope	1

Soil Type	**FRQ**
Clay Loam, Sandy	1

BIMBOWRIE STATION

Floristic Vegetation Map



Legend

FOREST

(9) *Eucalyptus camaldulensis* var. *camaldulensis* over *Enchylaena tomentosa* var. *tomentosa*, *Cymbopogon ambiguus*, *Solanum stuttianum* +/- *Maireana brevifolia* Open Forest

(6) *Casuarina pauper* over *Maireana pyramidata*, *Maireana appressa* +/- *Atriplex vesicaria* ssp. Low Open Forest

WOODLAND

(5) *Callitris glaucophylla* +/- *Eucalyptus porosa* over *Dodonaea viscosa* ssp. *angustissima*, *Sida petrophila*, *Cassinia laevis*, *Ptilotus obovatus* var. *obovatus* Low Open Woodland

(1) *Acacia aneura* var. over *Acacia tetragonophylla*, *Dodonaea lobulata*, *Sida petrophila* and *Ptilotus obovatus* var. Very Low Woodland

(4) *Alectryon oleifolius* ssp. *canescens* over *Sclerolaena patenticuspis*, +/- *Enchylaena tomentosa* var. *tomentosa* +/- *Tetragonia eremaea* Very Low Woodland

MALLEE

(10) *Eucalyptus socialis* ssp. over *Dissocarpus paradoxus* Mallee

(17) *Eucalyptus porosa* over *Cassinia laevis*, *Rhagodia parabolica*, *Cleania decurrens*, *Enchylaena tomentosa* var. *tomentosa* over *Chrysocephalum semipapposum*, *Solanum petrophilum*, *Atriplex stipitata* Mallee

SHRUBLAND

(3) *Acacia victoriae* ssp. *victoriae* over *Sclerolaena patenticuspis*, *Maireana pyramidata*, *Enchylaena tomentosa* var. *tomentosa*, *Rhagodia spinescens* Tall Very Open Shrubland

(14) *Rhagodia spinescens* over *Halosarcia pergranulata* ssp. *pergranulata*, *Halosarcia indica* ssp. *leiostachya* Shrubland

(2) *Acacia cameronii* over *Maireana pyramidata*, *Enchylaena tomentosa* var. *tomentosa*, +/- *Enneapogon cylindricus* +/- *Tetragonia eremaea* Open Shrubland

(7) *Dodonaea viscosa* ssp. *angustissima* +/- *Eremophila sturtii* over *Rhagodia spinescens* +/- *Maireana pyramidata* Open Shrubland

(11) *Atriplex vesicaria* ssp. +/- *Maireana astroloniche* +/- *Rhagodia spinescens* over *Sclerolaena obliquicuspis* Low Open Shrubland

(12) *Maireana pyramidata* over +/- *Sclerolaena patenticuspis* +/- *Sclerolaena tricuspis* +/- *Tetragonia eremaea* Low Open Shrubland

(13) *Maireana sedifolia* over *Ptilotus obovatus* var. *obovatus* Low Very Open Shrubland

(16) *Sclerolaena obliquicuspis*, *Enneapogon avenaceus*, *Asphodelus fistulosus*, *Carrichtera annua*, *Eriochiton sclerolaenoides* Low Sparse Shrubland

GRASSLAND

(15) *Triodia irritans* over *Ptilotus obovatus* var. *obovatus*, *Sida petrophila* Hummock Grassland

N

0 4.5

Kms

1:220,000

Produced by Biological Survey and Monitoring
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BIOLOGICAL SURVEY SOUTH AUSTRALIA

Department for Environment and Heritage

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Figure 4: Floristic Vegetation Map

Table 4 provides a summary of the area within the park covered by each vegetation community. A total of 298 polygons were delineated in the mapping process. The most extensive vegetation community was the Acacia aneura Very Low Woodland. This community was in a very degraded condition, with a high proportion of the species in a dead or dying state.

The chenopod shrubland groups were particularly difficult to differentiate on the aerial photography, with *Maireana aphylla* and *Maireana sedifolia* obvious examples. There were very few areas observed whilst conducting the field work that would have constituted mappable areas of a *Maireana sedifolia* Low Shrubland. This was further reflected in the floristic mapping, with only one polygon, containing a vegetation survey site, mapped.

The *Triodia irritans* Hummock grassland was found in an isolated pocket on the upper slopes and crest of the aptly named Porcupine Hill. This species was also found in a very degraded condition, with a large proportion of each *Triodia* ring being dead.

Acacia carneorum (Purplewood) has a conservation status of vulnerable at a regional, state and Australian level. There were two survey sites located within this community and a total of 20 polygons covering a total of 116 hectares were mapped. There were other smaller areas recoded during fieldwork but they were too small to capture at the scale of digitising.

Table 4 : Area covered by each mapping unit

Mapping Group	Area in Hectares	No. of Polygons
1 – *Acacia aneura* var. Very Low Shrubland	32,054.65	41
2 – *Acacia carneorum* Open Shrubland	115.72	20
3 – *Acacia victoriae* ssp. *victoriae* Tall Very Open Shrubland	2,066.83	57
4 – *Alectryon oleifolius* ssp. *canescen*s Very Low Woodland	33.38	10
5 – *Callitris glaucophylla* Low Open Woodland	1,906.85	7
6 – *Casuarina pauper* Low Open Forest	221.60	22
7 – *Dodonaea viscose* ssp*. angustissima* Open Shrubland	12,655.68	16
9 – *Eucalyptus camaldulensis* var. *camaldulensis* Open Forest	1,059.03	29
10 – *Eucalyptus socialis* Mallee	41.65	5
11 – *Atriplex vesicaria* ssp. Low Open Shrubland	271.80	4
12 – *Maireana pyramidata* Low Open Shrubland	13,873.78	38
13 – *Maireana sedifolia* Low Very Open Shrubland	15.57	1
14 – *Rhagodia spinescens* Shrubland	11.61	1
15 – *Triodia irritans* Hummock Grassland	86.82	1
16 – *Sclerolaena obliquicuspis* Low Sparse Shrubland	7,741.25	13
17 – *Eucalyptus porosa* Mallee	113.99	24

Conclusions and Recommendations

The Bimbowrie Native Vegetation Survey was conducted in April 2005, during and after a very dry preceding season and shortly after the de-stocking of sheep and culling of goats. This resulted in a low recording of annual plant species and particularly native grass species. There were also many instances were the species that were present at a site had visible grazing impacts, which were noted on the datasheets.

The entire project has also been conducted within a very tight timeframe. This has resulted in only a minimal reporting and analysis process being completed.

It is highly recommended that :

1. A repeat vegetation survey is conducted after a season of good rainfall and after a suitable recovery period from grazing pressure to get a more indicative list of plant species found within the park and within each survey site.
2. Additional survey sites be placed within the two mapping communities where no site data currently exists within the park. This is particularly pertinent for the *Eucalyptus porosa* Mallee community, as there is a possibility that some of the mapped areas could be *Eucalyptus intertexta*, as this species has been noted as present within the park, but no records were collected during the survey.
3. The original North Olary Vegetation Survey sites be re-visited to determine the identification of *Acacia ayersiana* var. *latifolia*, as this report has treated this species as *Acacia aneura*.
4. The Pastoral monitoring sites be revisited with a regime of vouchering of plant specimens. This would allow a more comprehensive species list for monitoring analysis and provide a higher level of certainty of species identifications for other data users.
5. The conservation status of the plants found within Bimbowrie Station be determined.
6. The conservation status of the vegetation communities be determined.
7. The floristic vegetation map be verified by field checking of polygon extents and vegetation mapping group. Particular attention should be paid to determining the location and extent of *Maireana sedifolia* communities, as these appear to have substantially declined. The delineation of the chenopod shrublands should also be a priority due to the difficulty experienced during the mapping process in distinguishing them on the aerial photography.
8. The pastoral monitoring group should monitor the effects of the removal of sheep on an ongoing basis.

References

Kutsche, F and McDonald, J. (2005) : The Bimbowrie Station Monitoring Review Report, Proposed Monitoring Program, Department for Environment and Heritage, Adelaide.

Heard and Channon (1997) Guide to a Native Vegetation Survey (Agricultural Region) Using the Biological Survey of South Australia. Department of Housing and Urban Development, Adelaide.

Appendices

Appendix 1 : Muir Code of Life Form

LIFE FORM/HEIGHT CLASS

T	Trees > 30m
M	Trees 15 - 30 m
LA	Trees 5 - 15 m
LB	Trees < 5 m
KT	Mallee *(>3m)
KS	Low Mallee *(<3m)
S	Shrubs > 2m
SA	Shrubs 1.5 - 2.0 m
SB	Shrubs 1 - 1.5 m
SC	Shrubs 0.5 - 1.0 m
SD	Shrubs 0 - 0.5 m
P	Mat plants (single plant)
H	Hummock grass
GT	Grass > 0.5 m
GL	Grass < 0.5 m
J	Herbaceous spp
VT	Sedges > 0.5 m
VL	Sedges < 0.5 m
V	Vines (twiners)
MI	Mistletoes
X	Ferns
MO	Mosses, liverwort
LI	Lichens

Appendix 2: Floristic Mapping Groups

NVIS Code	MU_50	Regional Floristic Description
		FOREST
NP0018	9	*Eucalyptus camaldulensis var. camaldulensis* over *Enchylaena tomentosa var. tomentosa, Cymbopogon ambiguus, Solanum sturtianum +/-Maireana brevifolia* Open Forest
BM0006	6	Casuarina pauper *over* Maireana pyramidata, Maireana appressa +/- Atriplex vesicaria ssp., *Low Open Forest*
		WOODLAND
BM0005	5	Callitris glaucophylla +/- Eucalyptus porosa *over* Dodonaea viscosa ssp. angustissima, Sida petrophila, Cassinia laevis, Ptilotus obovatus var. obovatus *Low Open Woodland*
BM0001	1	Acacia aneura var*. over* Acacia tetragonophylla, Dodonaea lobulata, Sida petrophila *and* Ptilotus obovatus var Very *Low Woodland*
BM0004	4	Alectryon oleifolius ssp. canescens *over* Sclerolaena patenticuspis +/- Enchylaena tomentosa var. tomentosa +/- Tetragonia eremaea *Very Low Woodland*
		MALLEE
SP0015	17	*Eucalyptus porosa mid mallee woodland over Cassinia laevis, Rhagodia parabolica, Olearia decurrens, Enchylaena tomentosa var. low open shrubland over Chrysocephalum semipapposum, Solanum petrophilum, Atriplex stipitata*
MN2405	10	*Eucalyptus socialis ssp.* over *Dissocarpus paradoxus* Mallee
		SHRUBLAND
FR0010	3	Acacia victoriae ssp. victoriae *over* Sclerolaena patenticuspis, Maireana pyramidata, Enchylaena tomentosa var. tomentosa, Rhagodia spinescens *Tall Very Open Shrubland*
BM0014	14	*Rhagodia spinescens* over *Halosarcia pergranulata ssp. pergranulata, Halosarcia indica ssp. leistachya* Shrubland
BM0002	2	Acacia carneorum *over* Maireana pyramidata, Enchylaena tomentosa var. tomentosa, +/- Enneapogon cylindricus +/- Tetragonia eremaea *Open Shrubland*
NP0019	7	*Dodonaea viscosa ssp. angustissima +/- Eremophila sturtii* over *Rhagodia spinescens, +/- Maireana pyramidata,* Open Shrubland
NP0032	11	Atriplex vesicaria ssp.,+/- Maireana astrotricha +/- Rhagodia spinescens over Sclerolaena obliquicuspis *Low Open Shrubland*
MM2801	12	*Maireana pyramidata* over *+/- Sclerolaena patenticuspis, +/- Sclerolaena tricuspis +/- Tetragonia eremaea* Low Open Shrubland
UN0004	13	*Maireana sedifolia* over *Ptiolotus obovatus var. obovatus* Low Very Open Shrubland
NP0038	16	*Sclerolaena obliquicuspis, Enneapogon avenaceus, Asphodelus fistulosus, Carrichtera annua, Eriochiton sclerolaenoides low sparse shrubland*
		GRASSLAND
BM0015	15	*Triodia irritans over Ptilotus obovatus var. obovatus, Sida petrophila* Hummock Grassland