

PROGRESS REPORT
MAPPING OF VEGETATION COMPLEXES
IN THE SOUTH WEST REGION
OF WESTERN AUSTRALIA

Prepared for: Department of Conservation and Land Management
Environment Forests Task Force

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January 1997

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Map

Status of Vegetation Mapping at December 31, 1996

1. SUMMARY

Mattiske Consulting Pty Ltd commenced work on the Vegetation Mapping Project as part of the Regional Forest Assessment of the South West Forest Region of Western Australia in October 1996.

This report provides a summary of progress to date on the vegetation mapping project. Although large sections of the work have been completed the team has major tasks ahead, namely:

- . Integration of the data sets (as approvals are given to release data),
- . Continuation negotiation on data access,
- . Data editing (locations - for example most early studies were undertaken using paced distances from track intersections and taxonomic changes on many of the historical data bases - for example some species have changed their names three times in the last two decades as a result of taxonomic revisions),
- . Further data collection in the gaps in the southern and south-eastern areas,
- . Data analysis of the different data sets by regions and subregions,
- . Vegetation mapping in the southern areas of the South West Forest Region,
- . Validation and Editing of Maps produced to date (boundary and polygon attributes require checking), and
- . Continuation of reporting and initial drafts of the final report.

Several issues have arisen to date that have highlighted the need to optimise efforts in the South West Forest Regions. These issues largely to the inconsistencies in spatial coverage in previous studies, the reliance in previous studies on floristic classifications rather than vegetation mapping projects and the enormity of the task required to maintain standards in the project when given such a short project time frame to complete the tasks at hand.

As indicated in the following text the project is at different phases for different sections of the South West Forest Region. Priorities have had to be changed as a result of availability of baseline soil and landform data and accessibility to some data sets (corporate information which is not owned by the contractor or the government agencies involved). As a consequence of the change in the mapping, there have been slight changes to the areas covered. Coverage by areas A to E as defined contractually are as follows as at December 31, 1996:

- . Area A - all of Area A has been re-mapped and the maps have been submitted to the Department of Conservation and Land Management for digitising.

- . Area B - the northern section of Area B (east of Perth) has been completed and submitted to the Department of Conservation and Land Management for digitising. The southern B areas have been awaiting field work (Donnybrook Sunklands or Blackwood Plateau - to be completed in January 1997) and the south-eastern area is awaiting on the Agriculture Department supplying baseline soil and landforms maps (to be completed in January and February 1997).
- . Area C - the northern sections of Area C have been completed on the eastern fringes of the area to sheet 2231 - III (slightly east-south-east of Collie) and been submitted to the Department of Conservation and Land Management for digitising. The south-western section of C (west of the Donnybrook Sunklands or Blackwood Plateau) have been studied in the field and mapping will be completed in January 1997. The remainder of Area C will be tackled in February and March 1997.
- . Area D - the northern two pockets of Area D (north-east and south-east of Perth) have been mapped and been submitted to the Department of Conservation and Land Management for digitising. The southern section of D (east of Manjimup) will be tackled in the latter part of January with the remainder of Area B.
- . Area E - no work completed on this area (awaiting maps from Agriculture Western Australia).

In summary, over 50% of the project area has been submitted to the Department of Conservation and Land Management for digitising at December 31, 1996.

Although a few changes have been necessitated by map availability and baseline resources, the project is progressing rapidly and the team is still aiming to complete the field studies by mid March and the draft final report by the middle of April 1997.

2. BACKGROUND RESOURCES

2.1 Hardware and Software

Mattiske Consulting Pty Ltd has upgraded their computer systems in order to meet the data handling and data auditing needs of the project.

A large graphics work-station has been commissioned; this consists of a 200 MHZ Pentium Pro CPU, 64 Mb RAM and 4 Gb disk, and operates under the Windows NT version 3.51 operating system. Additional Pentium based PCS have also been commissioned. All of the new machines have been connected to Mattiske Consulting's local area network, which is controlled by a Windows NT based server. Data backups are made daily from all attached PCS and from the main disk storage on the server, to DAT tapes.

The ARC/INFO package and the ARC/INFO Grid option have been installed on the graphics work-stations at Mattiske Consulting Pty Ltd. Conversion of the ANCA supplied DAM tools to ARC/INFO version 7.1 under Windows NT 3.51 is in progress. Conversion of the C programs supplied with the DAM tools to Visual C++ is in progress.

The SEDIT and HERBIE packages, which have been supplied by the WA Department of Conservation and Land Management, have been installed. It has been necessary to develop a supplementary system for SEDIT, based upon the Access data base package, because of the size of the site data base. The ANZLIC data base package, which was supplied by ANCA, has also been installed on Mattiske Consulting's network.

All climate grids for the South West Forest Region supplied by the Environment Forest Task Force for the duration of this project have been installed on Mattiske Consulting's network.

2.2 Baseline Maps

The Department of Conservation and Land Management has been supplying hard copies of the 1:50,000 series of maps as a means of expediting planning and field work for the Regional Forest Assessment in the South West Forest Region of Western Australia.

The soil and landform maps have been supplied as hard copies via the Department of Conservation and Land Management. All soil and landform data where available has been overlain on the topography maps as supplied by the Department of Land Administration. The areas east of Manjimup (one of the major data gap areas) has not been supplied as yet; however negotiations were held between representatives of Mattiske Consulting Pty Ltd, the Department of Conservation and Land Management and Agriculture Western Australia to ensure supply in January when the botanical field teams would be moving from the western section of the South West Forest Region to the areas east of Manjimup.

2.3 Data Accessibility

Various discussions have been held with owners of the data for the northern and southern forests (Alcoa of Australia Limited, Worsley Alumina Pty Ltd, BHP Beenup Titanium Minerals Project, researchers in the Department of Conservation and Land Management). At this stage, no data owned by the mining companies (estimated to be in the order of 30,000 sites and detailed polygon data for specific areas) has been released in writing to the project and therefore is not available for transfer to any government department databases. As large sections of this data were collected by Mattiske Consulting Pty Ltd on behalf of the mining companies concerned there has not been a constraint on data integration.

As the project progresses a range of unpublished smaller data sets are being exposed, largely within the Department of Conservation and Land Management system from researchers that have changed from the research to operational areas. As these data sets become available they are being sought through the appropriate individuals and organisations.

2.4 Literature Research

The literature research is essentially complete except for the integration into the international arena as the scientific papers on methodology and data analyses are developed.

2.5 Interaction of RFA Projects

A range of meetings have been held with the State Herbarium staff and the officers in the Department of Conservation and Land Management as a means to integrate data systems, plant specimen processing and data bases that may overlap different projects.

An apparent need to establish regular technical meetings to discuss issues relating to the flora and vegetation projects became very apparent from the initial meetings. These meetings have continued on a regular basis with individuals and or groups as required. Firstly as the vegetation project in itself can provide a substantial data base for integration with the flora projects and secondly as there is a need to eventually integrate data bases being established and or integrated at Mattiske Consulting Pty Ltd with those held at the Department of Conservation and Land Management.

2.6 Historical Data Bases

Previously collected data bases continue to be entered, edited and refined as required. One of the major project needs relates to the data integration phases, data entering (some data was collected prior to modern computer systems and hard copies of data only are available) and data editing (largely updating of location details onto a latitude/longitude system, modification of AMG grid data to latitude/longitude system and taxonomic changes since the data was collected). Some aspects of this work require very experienced input in view of the knowledge base required across disciplines. As required software development contractors, taxonomists and senior ecologists have been called upon to maintain the highest standards. The taxonomic changes have included voucher checking on the State Herbarium records and checking with specialists in the field if material in different projects was not vouchered. The taxonomic skills that Dr Eleanor Bennett and Mrs Beverley Koch bring to the Mattiske Consulting Pty Ltd team are being used in this auditing area. In addition the extensive experience of Mr Tony Anneals from CALM - Manjimup in the historical data bases in the southern forest areas has contributed to this auditing process on nomenclature changes.

3. VEGETATION STUDIES

3.1 Vegetation Mapping

The 1:50,000 map sheets which have been completed and submitted for digitising by the Department of Conservation and Land Management are summarised in Table 1.

The Map Reference refers to the 1:50,000 map sheet reference as developed by the Department of Land Administration. All maps included within the Regional Forest Assessment area for the South West Forest Region of Western Australia are listed to enable the Client to assess progress. Please note that the maps denoted with an asterisk are not complete sheets (e.g. 1829 - I, 1830- I, 1830 - II occur on the western coastal fringes only and 2031 - II and 2031 - I occur on the western fringes of the study area as a result of separation of the study area from the Swan Coastal Plain on the western edge).

It should be noted at this juncture that after discussions with the Department of Conservation and Land Management and Agriculture Western Australia it was decided to concentrate on map sheets for submission rather than subregional boundaries which often crossed several incomplete map sheets. The latter is slight digression from the original priorities and relates firstly to the availability of base soil and landform maps and secondly to the efficiencies required in a tight work programme if the project is to be completed by April 30, 1997.

It should be noted that the maps submitted to date cover essentially the System 6 area and the abutting maps in the northern section of the project area where additional areas have been completed to the edges of the Regional Forest Agreement area.

3.2 Field Studies

The field studies continue in all these areas as the data auditing highlights gaps in the information. Field studies have been completed in the Busselton to Augusta strip (1829 - I, 1830 - I, 1830 - II, 1929 - III, 1929 - IV, 1930 - III, 1930 - IV), the north-eastern area (2234 - III, 2234 - IV). In all these areas, unless clearing prevented sampling a minimum of two sampling sights were located within each major soil and landform type (where the soil and landform data is available, e.g. Tille in the south-west section) and where practical further sampling was undertaken. To the end of December a total of 147 extra detailed point sites (permanently marked 10m x 10m plots) had been sampled in the areas as defined and various boundary checking had been undertaken in the northern jarrah forest areas. In recent weeks the team has increased its sampling to an average of eight sampling sites per day per two person team (10m x 10m for understorey species and site parameters; 20 metre radius for the overstorey species and any additional opportunistic species). At this rate it is estimated to complete a further 900 sites in the coming eight weeks (we are attempting to fill the gaps in sampling within the coming eight weeks to enable data analysis and report writing still to be completed by April 30, 1997). Obviously if

time allows further sampling would be feasible.

The additional data collection is being concentrated in areas previously missed or poorly sampled. For example in the Busselton to Augusta areas the coastal heaths were covered by Gibson and therefore our team has concentrated on the forested areas and heaths on the inland areas.

Discussions were held with members of the Environment Forest Task Force in recent months regarding sampling regimes. The key issues in the South West Forest Region relate to the differential sampling rates within the project area. As a result of the coverage needs, the additional sampling for all species had to be modified from 20m x 20m plots to 10m x 10m plots. All these additional sites have been located with a GPS and have been permanently pegged allowing future re-location if required.

3.3 Data Interpretation and Data Analysis

The project team has been preparing summaries of data and data interpretations on subregions during the various phases of the project and has completed several drafts of some of the tables and appendices for the final report. The latter will be refined as more data auditing and data analyses are undertaken in coming months as the newly collected data is integrated with historical data bases.

In view of the data access restrictions caution has been expressed as to analysing data using all data sets. As discussed in several meetings data access issues need to be clarified in coming weeks to allow the team to minimise duplication of effort in the analysis phase of the project as time is limited for the total project.

Table 1: Vegetation Mapping 1:50,000 sheets at December 1996

Map Reference	New Field Sites	Boundary Checking	Vegetation Map Completed	Map submitted to CALM for digitising
1829 - I (*)	Yes	Part		
1830 - I (*)	Yes	Part		
1830 - II (*)	Yes	Part		
1929 - I				
1929 - II (*)				
1929 - III (*)	Yes	Part		
1929 - IV (*)	Yes	Part		
1930 - I (*)				
1930 - II				
1930 - III	Yes	Part		
1930 - IV (*)	Yes	Part		
2028 - I (*)				
2028 - II (*)				
2028 - IV (*)				
2029 - I				
2029 - II				
2029 - III (*)				
2029 - IV				
2030 - I	Part	Part	Yes	Yes
2030 - II	Part	Part	Yes	Yes
2030 - III	Part	Part	Yes	Yes
2030 - IV (*)	Part	Part	Yes	Yes
2031 - I (*)	Part	Part	Yes	Yes
2031 - II (*)	Part	Part	Yes	Yes
2032 - I (*)	Part	Part	Yes	Yes
2032 - II (*)	Part	Part	Yes	Yes
2127 - I (*)				
2128 - I				
2128 - II (*)				

Table 1: Vegetation Mapping 1:50,000 sheets at December 1996

Map Reference	New Field Sites	Boundary Checking	Vegetation Map Completed	Map submitted to CALM for digitising
2128 - III (*)				
2128 - IV				
2129 - I				
2129 - II				
2129 - III				
2129 - IV				
2130 - I	Part	Part	Yes	Yes
2130 - II	Part	Part	Yes	Yes
2130 - III	Part	Part	Yes	Yes
2130 - IV	Part	Part	Yes	Yes
2131 - I	Part	Part	Yes	Yes
2131 - II	Part	Part	Yes	Yes
2131 - III	Part	Part	Yes	Yes
2131 - IV	Part	Part	Yes	Yes
2132 - I	Part	Part	Yes	Yes
2132 - II	Part	Part	Yes	Yes
2132 - III	Part	Part	Yes	Yes
2132 - IV	Part	Part	Yes	Yes
2133 - I	Part	Part	Yes	Yes
2133 - II	Part	Part	Yes	Yes
2133 - III	Part	Part	Yes	Yes
2133 - IV	Part	Part	Yes	Yes
2134 - I	Part	Part	Yes	Yes
2134 - II	Part	Part	Yes	Yes
2134 - III	Part	Part	Yes	Yes
2134 - IV	Part	Part	Yes	Yes
2135 - I (*)	Part	Part	Yes	Yes
2135 - II (*)	Part	Part	Yes	Yes

Table 1: Vegetation Mapping 1:50,000 sheets at December 1996

Map Reference	New Field Sites	Boundary Checking	Vegetation Map Completed	Map submitted to CALM for digitising
2135 - III	Part	Part	Yes	Yes
2135 - IV (*)	Part	Part	Yes	Yes
2227 - I (*)				
2227 - IV (*)				
2228 - I				
2228 - II				
2228 - III				
2228 - IV				
2229 - I (*)				
2229 - II (*)				
2229 - III				
2229 - IV				
2230 - I (*)				
2230 - II (*)				
2230 - III				
2230 - IV				
2231 - II (*)	Part	Part	Yes	Yes
2231 - III	Part	Part	Yes	Yes
2231 - IV	Part	Part	Yes	Yes
2232 - I (*)	Part	Part	Yes	Yes
2232 - III	Part	Part	Yes	Yes
2232 - IV	Part	Part	Yes	Yes
2233 - I (*)	Part	Part	Yes	Yes
2233 - II (*)	Part	Part	Yes	Yes
2233 - III	Part	Part	Yes	Yes
2233 - IV	Part	Part	Yes	Yes
2234 - III (*)	Part	Part	Yes	Yes
2234 - IV (*)	Part	Part	Yes	Yes
2328 - I				

Table 1: Vegetation Mapping 1:50,000 sheets at December 1996

Map Reference	New Field Sites	Boundary Checking	Vegetation Map Completed	Map submitted to CALM for digitising
2328 - II (*)				
2328 - III (*)				
2328 - IV				
2329 - II (*)				
2329 - III (*)				
2428 - III (*)				
2428 - IV (*)				
2429 - III (*)				

4. PRIORITIES FOR JANUARY 1997

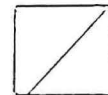
The following priorities exist for January 1997:

- . Complete the mapping of the area from Busselton to Augusta and the Blackwood Plateau area,
- . Edit the maps for the northern area of the RFA study area including checking boundaries and polygon attributes,
- . Complete the plant identifications for the Busselton to Augusta sites and the northern and eastern field work sites,
- . Process the voucher specimens collected to date (pressing, labelling and submitting to State Herbarium),
- . Continue the integration of historical data bases with the new data bases being collected, the data analysis and the data auditing phases of the project,
- . Continue data collection in the areas west of Nannup and east of Manjimup (including mapping the area north-east of Manjimup) and define the detailed data collection needs in the areas south of Manjimup, including the needs to check locations of Inions and Wardell--Johnson site locations (field checking as required with GPS),
- . Continue preparing tables and appendices for the reporting phase later in the project.
- . Continue interactions with officers within the Department of Conservation and Land Management and members of the Environment Forest Task Force.

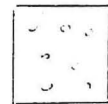
South West - Western Australia
VEGETATION MAPPING PRIORITIES

- A System 6 study area within RFA boundary.
- B Largely CALM estate or where native vegetation is mainly intact but no soil and landform mapping available.
- C Largely CALM estate or cleared or remnant areas and where soil and landform mapping is already available.
- D Remnant vegetation where soil and landform mapping will be required.
- E Seard (1981) jarrah forest outside RFA boundary.

Produced by Information Management Branch - July 1996



Completed
 31.12.96



Planned for
 30.1.97

