



Collection of Vegetation Data from Historical Portion Plan Surveys

Southern CRA Region

A project undertaken as part of the NSW Comprehensive Regional
Assessments

October 1999



COLLECTION OF VEGETATION DATA FROM HISTORICAL PORTION PLAN SURVEYS

SOUTHERN CRA REGION

State Forests of NSW

A project undertaken for
the Joint Commonwealth NSW Regional Forest Agreement Steering Committee
as part of the
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For more information and for information on access to data contact the:

Resource and Conservation Division, Department of Urban Affairs and Planning

GPO Box 3927
SYDNEY NSW 2001

Phone: (02) 9228 3166
Fax: (02) 9228 4967

Forests Taskforce, Department of the Prime Minister and Cabinet

3-5 National Circuit
BARTON ACT 2600

Phone: 1800 650 983
Fax: (02) 6271 5511

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PROJECT SUMMARY

This report describes a project undertaken as part of the comprehensive regional assessments of forests in New South Wales. The comprehensive regional assessments (CRAs) provide the scientific basis on which the State and Commonwealth Governments will sign regional forest agreements (RFAs) for major forest areas of New South Wales. These agreements will determine the future of these forests, providing a balance between conservation and ecologically sustainable use of forest resources.

Project objective/s

This project was undertaken to collect historical information on vegetation cover from a representative sample of original portion plans within parishes in the Southern CRA region.

Methods

Locations (in terms of easting and northing) of tree types from each corner of each portion were collected and entered into an MSAccess database. In addition to this information, the date the survey was carried out and general vegetation information was also recorded.

Key results and products

The project produced a database consisting of vegetation data from 990 portions within a representative sample of 100 parishes across the Southern CRA region of NSW. The data was provided for use in the CRA vegetation mapping project which will use this information to assist in estimating the pre-1750 extent of vegetation types/forest ecosystems.

1. INTRODUCTION

1.1 OBJECTIVES

The specific objectives of this project were to:

- (i) collect historical information on vegetation cover from a sample of original portion plans within parishes in the southern CRA region which support the mapping of pre-1750 vegetation on cleared lands within the Region;
- (ii) relate this information to grid references so that other projects can apply the data spatially to other vegetation and environmental data; and
- (iii) produce a report documenting methods, results and limitations.

1.2 BACKGROUND

Given that forest ecosystem biodiversity is reflected primarily in its vegetation complexity, the pre-1750 data layer is an important base data layer for the design of forest ecosystem reserves. For the purposes of vegetation reservation and other dependent layers such as fauna habitat, it is critical that this layer be as accurate as possible and the accuracy of the data be known.

The potential to use historical data to refine the pre-1750 vegetation map was investigated. A case study was conducted by two consultant historians, M. Ryan and B. J. Stubbs, for the National Parks and Wildlife Service of NSW (NPWS) over an area comprising seven parishes in the County of Richmond (see final report June 1996). An historical overview of the sequence of land use in this area, and a discussion of the effects of various land uses on the original vegetation of the area were presented. A detailed examination of two parishes (Bungawalbin and Tatham) within the case study area was made. Based on the reasoned premise that vegetation disturbance prior to free selection was relatively insignificant, maps showing the original distribution of vegetation in these two parishes were compiled from portion plans prepared in connection with the conditional purchase of land under the *Crown Lands Alienation Act, 1861*.

This study concluded that “where the destruction of the vegetation has been complete, the historical record, and in particular the conditional purchase plans, is indispensable in reconstructing the pre-settlement pattern of vegetation. Even in less severely modified areas, where existing thinned vegetation or minimally disturbed remnants of the original forest can be used to infer the original pattern across a wider area, the historical record is a valuable reference.”

Another study was done by DN Jeans of the Sydney University Geography Department, over the Big Scrub area of the Richmond River valley (Jeans 1991). Using portion plans and mapping the vegetation formations systematically across the various parishes, a map of the pre-alienation vegetation of the Big Scrub was reconstructed. Jeans (1991) found that surveyors, operating at different times and at intervals of some years, showed formation boundaries with few discrepancies from portion to portion, suggesting that the work was done conscientiously. He concluded that the surveying archives of the Lands Department can provide the basis for the mapping of pre-alienation vegetation, although the information is limited botanically to a description of formation, as relatively few species are named.

The Environment and Heritage Technical Committee (EHTC) believed that historical studies would aid in deriving and refining the pre-1750 vegetation layer. NPWS confirmed, on the basis of the Ryan and Stubbs report, that historical studies will be a useful tool to derive the pre-1750 vegetation layer, in combination with modelling techniques (S. Ferrier, pers comm). For the Upper North East (UNE) and Lower North East (LNE) CRA regions, historical portion plan information was successfully used to refine the pre-1750 vegetation mapping.

In the Southern CRA region, mapping of pre-1750 and extant vegetation will be determined by modelling across all tenures. Floristic site data (plot data) will be analysed to produce forest vegetation classes. The forest vegetation will be modelled by using geographic and environmental information to extrapolate the site data over the landscape. Aerial Photography Interpretation (API) floristic mapping and plot data which recorded only canopy species will be used where possible to improve the spatial accuracy of the model. Improvement and verification of spatial accuracy of modelled vegetation in cleared areas is dependent upon observation and measurements of remnant vegetation. Information collected from the historical portion plans will significantly supplement the information available for cleared areas. Both classification and mapping will be carried out in two steps to allow iterative improvements to be made to the vegetation type model.

1.3 SCOPE OF THE PROJECT

NPWS, in its estimation of the pre-1750 vegetation, concluded that the approach adopted by Ryan and Stubbs (1996) had merit and should be considered for use in future conservation planning work. However, NPWS recommended that any such application of these techniques, such as for the proposed CRAs, be preceded by further testing and refinement. This project provides information that will improve the prediction of pre-1750 vegetation distribution in the Southern CRA region.

It was not feasible in the CRA timeframes or within the EHTC technical framework budget to gather historical information from the entire Southern CRA region. It was recognised that historical data should, therefore, be used in areas where the pre-1750 vegetation map had the lowest level of confidence, namely over extensively cleared land on the coastal plain and tablelands.

This project was limited to data collation only. The data outputs will be used by the CRA vegetation mapping project for interpretation and analysis of extensively cleared lands within the Southern CRA Region. The data will be used alongside other floristic data sources to inform on the classified vegetation groups which existed on cleared land.

1.4 PROJECT CO-ORDINATION

The data was collated by State Forests of NSW (SFNSW) personnel at the Department of Lands and Water Conservation (DLWC) office in Bridge St, Sydney City.

The following section describes the methodology adopted for the project and the results.

2. METHODOLOGY AND RESULTS

2.1 METHODOLOGY

2.1.1 Sampling methodology

A subset of parishes were selected from those occurring within the region, to provide a representative sample both geographically and environmentally (in terms of climate, terrain and soils). The exact number of parishes to be selected, and the number of portions to be sampled within each parish, was determined in the initial planning phase of the project. It was decided that ten portions should be selected randomly from each of 100 representative parishes across the Southern CRA region. Given the project's strong link with the vegetation mapping project, the sampling methodology was determined through a joint planning exercise between SFNSW and NPWS.

Maps of existing vegetation cover across all tenures were derived from the Eastern Bushlands database information. These maps were used initially to determine which parishes were suitable for detailed study on the basis of current vegetation coverage. The Southern CRA region differed slightly to that in the UNE and LNE CRA regions due to the availability of a pre-1750 grasslands layer. As a result this layer combined with the parish boundary layer and the Eastern Bushlands database layer were used to discard any parishes with pre-1750 grasslands from the selection process. Once pre-1750 grasslands were removed, the selection was carried out using systematic random sampling.

After removing the parishes with 50% or more pre-1750 grassland, parishes in the region were listed from those with 0% vegetation over the entire parish to those with 100% vegetation. Every fourth parish in the region was mapped to determine how representative the selection was. The selection of parishes continued until agreement was reached between NPWS and SFNSW that the selection was representative both geographically and environmentally (in terms of climate, terrain, and soils), with preference given to those parishes in which a relatively large proportion of native vegetation has been cleared. One hundred and thirty parishes were selected in total to allow for parishes which had a lack of information to be disregarded and another parish selected.

A random sample of portions was chosen from within each selected parish. Portion numbers for plans that were unavailable or plans that had inadequate vegetation detail were discarded. On completion of the project, 990 portions were collected from 100 parishes within the Southern CRA region.

2.1.2 Data collection

The portion plans for each of the selected portions were used to extract, and enter into a database (in an MSAccess format), the general vegetation type and specific tree type associated with each surveyed corner of the portion. Australian Map Grid coordinates for each of these corner points (ie corner tree positions) were recorded from 1:25 000 topographic maps.

Information collected and recorded included:

- Parish name and county name;

- Portion number;
- Map sheet name/number for each corner (more than one topographic map sheet may cover a single portion);
- Map grid references (easting and northing) for each corner;
- The general vegetation type (for example brush, open forest, swamp) occurring at each portion corner. Such information is often not recorded on the portion plan, or cannot be ascertained for all corners. Other relevant information appearing on the portion plan is also recorded under this heading (e.g. ridge, hilly country, flat land);
- Tree type used to mark each corner (or note the absence of a tree if the corner is marked by a stake or post, as this may indicate naturally treeless areas or areas of sparse tree coverage);
- Plan number for each portion; and
- The date of survey of each portion (or the estimated date of survey if the actual date is not recorded on the plan).

This procedure was followed until ten randomly selected portions had been described for each parish.

2.2 RESULTS

The results of this project were entered into an MSAccess database for the Southern CRA region. This data was supplied electronically to NPWS for use in the vegetation mapping project and to the Resource and Conservation Assessment Division (RACD).

For the Southern CRA Region, data was collected from 990 portions within 100 parishes. The 100 parishes sampled are listed below in Table 2a and shown in Figure 2a. Table 2a lists the corresponding parish identification number (refer Figure 2a), percentage of vegetation, and the County name for each parish. A number of parishes did not have sufficient information available to record information for 10 portion per parish. These parishes are identified in Table 2a.

The data was delivered to NPWS within the project timelines.

TABLE2a: List of Parishes Sampled in Southern CRA Region

Southern selected parishes			
County	Parish	% Veg *	No.
Argyle	Breadalbane	1	1
Argyle	Collector	19	2
Argyle	Kerrawary	55	3
Argyle	Oallen	68	4
Argyle	Quialigo	24	5
Argyle	Strathaird	36	6
Argyle	Terranna	19	7
Beresford	Binjura	36	8
Beresford	Bransby	15	9
Beresford	Bredbo	62	10
Beresford	Callaghan**	38	11
Beresford	Clifford	72	12
Beresford	Colinton	54	13
Beresford	Flinders	63	14
Beresford	Undoo	57	15
Buccleuch	Childowla	63	16
Buccleuch	Mundongo	13	17
Buccleuch	Wyangle	64	18
Camden	Sutton Forest	15	19
Cowley	Umburra	29	20

Southern selected parishes			
County	Parish	% Veg *	No.
Dampier	Guinea	59	21
Dampier	Wyanbene	73	22
Georgiana	Belmore	21	23
Georgiana	Bubalahla	53	24
Georgiana	Garrynian	50	25
Georgiana	Gillindich	57	26
Georgiana	Mulgowrie	25	27
Georgiana	Sherwood	24	28
Goulburn	Carabobala	0	29
Goulburn	Coppabella	52	30
Goulburn	Cumboroona	5	31
Goulburn	Forest Creek	3	32
Goulburn	Murray	22	33
Goulburn	Narra Narra Wa	37	34
Goulburn	Wagra	32	35
Goulburn	Yarra Yarra	12	36
Harden	Mylora	5	37
Harden	Woolgarlo	19	38
King	Biala	28	39
King	Cullarin	7	40
King	Derringullen	6	41
King	Grabben Gullen	14	42
King	Jerrawa	20	43
Mitchell	Pulletop	11	44
Murray	Burra	20	45
Murray	Fairy Meadow	27	46
Murray	Gundaroo	40	47
Murray	Nanima	2	48
Murray	Ollalulla	47	49
Murray	Wallaroo	9	50
Murray	Wamboin	13	51
Murray	Warroo	8	52
Selwyn	Glenken	30	53
Selwyn	Indi	49	54
Selwyn	Maragle	52	55
Selwyn	Munderoo	32	56
Selwyn	Tooma	12	57
Selwyn	Yellowin	75	58
St Vincent	Bettowynd	61	59
St Vincent	Boyle**	17	60
St Vincent	Braidwood	8	61
St Vincent	Conjola	62	62
St Vincent	Durran Durra	34	63
St Vincent	Jerricknorra	67	64
St Vincent	Mongarlowe	45	65
St Vincent	Percy	14	66
St Vincent	St George**	71	67
St Vincent	Tallaganda	74	68
St Vincent	Tomerong	76	69
St Vincent	Wog Wog	70	70
St Vincent	Wollumboola		71
St Vincent	Woodburn	78	72
Wallace	Addicumbene**	79	73
Wallace	Beloka	25	74
Wallace	Caddigat	1	75
Wallace	Clyde	23	76
Wallace	Coonhoonbula	6	77

Southern selected parishes			
County	Parish	% Veg *	No.
Wallace	Gungarlin	66	78
Wallace	Gygederick	18	79
Wallace	Middlingbank	39	80
Wallace	Numbla	15	81
Wallace	Nungar	77	82
Wallace	Wambrook	43	83
Wallace	Wilson	35	84
Wellesley	Cambalong	70	85
Wellesley	Corrowong	38	86
Wellesley	Quidong	58	87
Westmoreland	Adderley**	31	88
Westmoreland	Alfred	74	89
Westmoreland	Bulgarres	31	90
Westmoreland	Drogheda	53	91
Westmoreland	Langdale	5	92
Westmoreland	Oldbuck	55	93
Wynyard	Bulalgee	42	94
Wynyard	Califat	24	95
Wynyard	Courabyra	41	96
Wynyard	Gilmore	27	97
Wynyard	Goldspink	29	98
Wynyard	Murraguldrie	44	99
Wynyard	Nacki Nacki	62	100

Note: * % Veg. Indicates the percentage of vegetation currently within the parish.

** These parishes have been included but do not have ten portions per parish. The Parish of Adderley in the County of Westmoreland and the Parish of Callahan in the County of Beresford only had 9 portions collected. The Parishes of Boyle and St George in the County of St Vincent only had 8 portions collected. The Parish of Addicumbene in the County of Wallace only had 6 portion collected.

3. LIMITATIONS

3.1 LIMITATIONS

The plans used for this study were prepared over a period of about 140 years (from the 1830s until the 1970s), and by numerous different surveyors, working in varying vegetation types. The terminology and graphical symbols used to describe and indicate the vegetation varied from surveyor to surveyor and from plan to plan. Some of the limitations of using such a non-uniform set of records to reconstruct pre-settlement vegetation patterns have been described in Ryan and Stubbs (1996).

Some particular aspects of the methodology as applicable to the present study are described hereunder.

3.1.1 Map grid references for corners

Map grid references are given for each corner to the nearest 50 metres (2mm at a map scale 1:25,000). This is considered to be the best result obtainable given the inherent level of accuracy of the topographic maps, and the slight misalignment of the topographic base and the cadastral layer.

3.1.2 Tree type

The corner tree descriptions used by surveyors range from the highly specific (e.g. spotted gum) to the very general (e.g. 'brush', for rainforest species, or even simply 'tree' or 'sapling'). In the former case, these descriptions can readily be translated into botanical names (e.g. *Corymbia maculata*). Less specific descriptions (e.g. stringybark, gum, ash, apple) may refer to more than one, perhaps several different species. Other descriptions (e.g. peppermint) may be impossible to interpret, or may only be interpreted sensibly with the aid of good local botanical knowledge.

3.1.3 Vegetation type

Descriptions of vegetation type (and of topographical information) within a portion vary from the highly detailed to the non-existent. Portions were not excluded from the sample because of the absence of such information if corner tree details were provided. In most cases, however, such information was provided by the surveyor and this is a valuable aid in the interpretation of the corner tree details, as well as providing good descriptions of the vegetation cover across the portion.

Vegetation descriptions are of two main types: first, they are notations or stylistic indications of particular vegetation units within the portion (brush land and swamp is generally clearly demarcated and distinguished from open forest, for example); secondly, they are general comments which apply to the vegetation across the whole portion (used more often on more recent plans).

In addition to vegetation information, information about landform provided by the surveyor has often been recorded where it is believed that this may be useful in interpreting the vegetation cover.

4. REFERENCES

Jeans, D. N. 1991 *Natural vegetation formations of the Big Scrub area of the Richmond River valley*. In Phillips, S.(ed.) *Rainforest remnants, Proceedings of a workshop on rainforest rehabilitation held at North Coast Agriculture Institute, 17-18 November, 1988* (NSW National Parks and Wildlife Service, Lismore).

Ryan, M. and Stubbs, B.J. 1996 *Pre-1750 vegetation model: historical study*. Consultancy report for NSW National Parks and Wildlife Service.