REVIEW

Vegetation survey and mapping in Queensland

V.J. Neldner, Queensland Botany Bulletin No. 10, Brisbane: Queensland Department of Primary industries, 1993, 70 pp.

This is a timely review on the history and current status of vegetation survey and mapping in Australia. It draws on a wide body of literature in examining past and present approaches to vegetation survey and mapping with particular emphasis on the work undertaken by the Queensland Herbarium.

The report summarises the history of plant community classification, sampling methods used to classify vegetation, values and uses of vegetation surveys, limitations of surveys, the problem of mapping scale and future directions including the use of geographical information system (GIS) technology. Many tables complement the text.

The imposition of classification on the complex world of species distributions results in compromise. This compromise was recognised by early workers in this field and is noted in Neldner's paper by way of a quote from a pioneering doctrine on plant community classification by Beadle and Costin (1952):

"Classification is essentially a compromise between the desire to preserve the natural groupings as continuously varying entities and the need to subdivide them for more utilitarian purposes."

This raises the question — what is the appropriate level of homogeneity of species composition to define communities? This is a key question still requiring more research. Yet it is crucial in the reasoning for examining and defining patterns in nature. Scale or intensity of survey relates to this. As Neldner illustrates, with the history of Queensland vegetation mapping, scale has been chosen largely on the basis of available resources. So 1:1 000 000 and 1:250 000 scales have been adopted for most standard mapping except in special circumstances. The principal aim has been to provide an overview. In NSW we are generally mapping at 1:100 000 scale in the east but 1:250 000 scale in the floristically simpler inland areas. Larger scale maps have been produced for reserves or forests. Given current resources committed to regional botanical survey and mapping in Australia, it will be a very long time before the continent is mapped at say the 1:100 000 scale, yet in my experience this is the minimum scale that land use agencies would like to assist them with property, catchment or reserve management. Other agencies would prefer 1:25 000 mapping for particular areas, for example national parks or state forests.

Lengthy discussion is given to fitting data to the different structural/floristic classifications used in Australia. Perhaps an emphasis should be placed on the need to collect and store raw core attribute data so that it can be used by a range of analyses (Bolton 1992).

Neldner makes an observation that numerical floristic classifications are rarely mapped. What we mainly see on vegetation maps are aerial photograph interpretations of vegetation structure with some dominant floristics applied in some cases (largely depending on the quality and scale of the photographs). Several floristic classifications (whether numerical or traditional) may fall under each photo unit and are described in the text of an accompanying paper. With the advent of more sophisticated modelling, predictive maps may become more important in the future but the quantity of data needed to ensure models work may be so great that the costs of acquiring it may prohibit the project being started or finished. Herein lies a dilemma for the plant ecologist – for a given cost you have the option of acquiring much data

over a small area or less data over a larger area. Generally this is solved by relating projects to their purpose and taking into account resources available.

The advent of improved LANDSAT TM imagery with finer levels of resolution has provided an alternative means of coarse scale mapping of less complicated vegetation. This is not successful in complex eucalypt forests on the east coast or tablelands where problems of shadow are encountered and the difference in reflectance of different types of eucalypt forest are small. At this stage LANDSAT cannot replace aerial photographs for vegetation mapping work except for delineating the outer boundaries of forested lands. Such data can be very useful for assisting with ground survey design.

In his discussion on sampling, Neldner could have enlarged on the efficiency of using explicit, well designed, stratified sampling procedures. It has long been appreciated that maximising the number of sampling sites in botanical surveys facilitates better use of exploratory statistical analyses to aid the ecologist in interpreting patterns and query possible determinants of those patterns (for example, McKenzie *et al* (1991).

The problem of dissemination of information is also raised in the report. It pays tribute to this journal for filling a niche by publishing results of vegetation survey and mapping. However, there have been cases in NSW where other Government agencies were unaware of publications relevant to their survey programmes. In some cases this has resulted in duplication of work. With the distribution of index data bases, such as the one being developed for vegetation studies in the Murray Darling Basin, duplication will be minimised in the future.

Another important point canvassed in the report is the possible misuse of digitised vegetation maps or survey data where a third party, who, without the benefit of field knowledge, attempts to draw definitive conclusions from some other person's data. It is likely that this problem will grow with the wider use of GIS. The report rightly raises some fundamental questions for the future, particularly the impact of GIS on vegetation sampling and mapping.

If regional vegetation surveys and mapping have benefits to the tune of 40:1, as suggested by Neldner, it would seem prudent to conduct more surveys throughout Australia. I disagree, however, with the Queensland Herbarium's policy of mapping original vegetation. In NSW we are now concentrating on surveying and mapping existing vegetation cover. Extrapolations to cleared land can be made if observational data is available or modelling is possible but this is seen as a secondary objective.

If carried out under well designed methods, vegetation survey and mapping can form one of the best information bases to assist with the long term management of species and ecosystems and with the rehabilitation of land. There is an urgent need for programs to be accelerated by governments throughout Australia.

References

Beadle, N.C.W. and Costin, A.B. (1952) Ecological classification and nomenclature. *Proc. Linn. Soc. New South Wales* 77:62-82.

Bolton, M. (ed.) (1992) *Vegetation: from mapping to decision support.* (Environmental Resources Information Network: Canberra)

McKenzie, N.L., Robinson, A.C. and Belbin, L. (1991) Biogeographic survey of the Nullarbor District, Australia. In Margules, C.R and Austin, M.P. *Nature conservation: cost effective biological surveys and data analysis.* (CSIRO: Australia)

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