# PART IV

# THE PATTERNS OF ECOLOGY AND LAND-USE

# TABLE OF CONTENTS

**DISTRIBUTION OF ENVIRONMENTAL PATTERNS.....4**

PRINCIPLES AND TECHNIQUES.....4

*(i) The Principles Involved*.....*4*

*(ii) Mapping Techniques*.....*4*

THE MAPPING UNITS.....4

# LIST OF TABLES

TABLE 12 - LAND ZONES, LAND SYSTEMS AND SUB-SYSTEMS.....4

# DISTRIBUTION OF ENVIRONMENTAL PATTERNS

## *PRINCIPLES AND TECHNIQUES*

### *(i) The Principles Involved*

The principles which are used to study the ecology of an area and to produce the information in a concise but useful form have been evolved by the research staff of the Soil Conservation Authority. They have been described by Gibbons and Downes (1964).

The systems of productive land-use are primarily based on the growth of plants. It is therefore necessary to study those factors of the environment which affect plant growth. These are the climate, the soils and their parent materials, and the topography including steepness of slope, elevation, aspect and configuration. Other factors which interact to influence the soils are the organisms, both fauna and flora and the length of time all factors have been operating.

The aim of this study has been to provide information which can be used to separate areas in which the climate, parent materials, topography, soil and native vegetation are uniform within limits considered significant for likely forms of land-use. The individual areas of uniform environment are not mapped, but larger areas have been mapped, in which the variations in the environment occur in a regular manner and are therefore predictable.

Topography (combinations of land forms) exerts considerable influence on the distribution patterns of soils, vegetation, erosion hazard and to a certain extent climate. Geology and time, and to a certain extent climate, have influenced the topography. Thus, topographic patterns can be used as the basis on which to predict variations of the other environmental factors, and have the practical advantage of being readily mapped.

Simple topographic patterns are mapped and depicted by an idealised topographic section, and the distributions of the other factors are related to the topographic elements (land forms) in the diagram. Where the variation in parent materials or climate within a basic topographic unit has been greater than can be represented by a simple idealised landscape diagram, further subdivision on the basis of these factors has been made. The mapping units so derived are the land systems.

### *(ii)Mapping Techniques*

The various approaches and techniques used in collecting information and mapping are described in some detail by Gibbons and Downes (1964).

All the available information of the environmental factors was collected, and where possible, was put on to base maps of 2 miles to 1 inch scale. The land forms were recognised and delineated on photo-mosaics at 1 mile:1 inch or 40 chains:1 inch. This was done by stereoscopic interpretation of aerial photographs and where necessary by aerial inspection from light aircraft. Field traverses were used to check interpretations and to identify land forms which were not clearly observable by the other means. Differences in terrace levels were sometimes mapped in this way.

Patterns of land forms were recognised and delineated on the photo-mosaics and the boundaries were transferred to the 2 miles:1 inch base map.

## *THE MAPPING UNITS*

The mapping units recognised are set out in Table 12.

Land zones have been defined by Gibbons and Downes (1964) as the primary subdivision of a very large area of country. They consist of groups of land systems in which the main land forms or other dominant features are similar. In Table 12, the land systems have been grouped into land-zones to indicate geomorphic affinities.

All the land-systems are based on patterns of land forms, or on differences in elevation where these significantly affect the climate. The Dederang and Tawonga land systems have been subdivided into

sub-systems on the basis of climate and the Kiewa land system has been subdivided on the basis of flooding characteristics.

Boundaries between units based on differences in topography are usually fairly easy to recognise and may be mapped with reasonable accuracy. A geomorphic boundary which has proved difficult to define and map satisfactorily is between the Yackandandah land-system, where the dominant geomorphic feature is the dissected ancient strath bench, and the Dederang land system where there are small isolated relics of the strath bench associated with the general valley slopes.

Because climate is a continuous variable and generally changes gradually, the boundaries based on climatic differences are somewhat arbitrary. The boundaries concerned are those between the two sub-systems of the Dederang land system, and those between the three sub-systems of the Tawonga land system.

Climate is one of the most important differences between the Feathertop land system and the Darbalang sub-system of the Tawonga land system, but their boundary has been delineated on the abrupt change in vegetation.

***TABLE 12 - Land Zones, Land Systems and Sub-systems***

| Land Zones | Land Systems | Sub-systems |
|---|---|---|
| Kiewa (alluvial terraces and valley slopes land forms) | 1. Kiewa<br>2. Dederang<br>3. Yackandandah<br>4. Twists Creek | (a) Tangambalanga<br>(b) Mullagong<br>(c) Bonegilla<br>(d) Mullindolingong |
| Leneva (hills with plateaux) | 5. Leneva | |
| Big Ben (plateaux) | 5. Stanley<br>7. Big Ben<br>8. High Plains | |
| Tawonga (steep montane slopes) | 9. Tawonga<br>10. Feathertop | (a) Baranduda<br>(b) Wermatong<br>(c) Darbalang |