



# **A STUDY OF THE LAND IN THE CATCHMENTS TO THE NORTH OF MELBOURNE**

**BY  
P.J. JEFFERY**

**1981**

# CONTENTS

Acknowledgements .....	1
1. INTRODUCTION.....	2
2. CLIMATE.....	5
Rainfall.....	5
Temperature .....	6
Potential Evapotranspiration .....	6
Effective Rainfall .....	8
Snow.....	8
Frost.....	8
Climate of Individual Land Systems.....	9
3. PHYSIOGRAPHY AND GEOLOGY.....	12
1. EASTERN HIGHLANDS .....	12
Kinglake Plateau .....	12
Nillumbik Terrain.....	12
2. WESTERN HIGHLANDS.....	12
3. VOLCANIC PLAINS .....	13
4. SOILS.....	14
SOIL FORMATION .....	14
Soil Formation on Basalt.....	14
Soil Formation on Granodiorite and Rhyodacite .....	15
Soils of the Volcanic Plains .....	15
Uniform Soils .....	15
Gradational Soils .....	16
Soils of the Nillumbik Terrain .....	16
Mottled, Yellow Brown Sodic Duplex Soils.....	16
Soils of the Mountains and Plateaux.....	17
Gradational Soils .....	17
Duplex Soils .....	17
5. NATIVE VEGETATION .....	18
Grassland and Open Woodlands .....	18
Woodlands.....	21
Open Forests.....	21
6. LAND SYSTEMS.....	22
Tabular Descriptions .....	23
LAND SYSTEM DESCRIPTIONS.....	30
7. SOIL CONSERVATION.....	89
Types of Deterioration and Management Practices in the Study Area .....	89
1. Sheet Erosion .....	89
2. Rill Erosion .....	89
3. Gully Erosion .....	90
4. Tunnel Erosion .....	91
5. Mass Movement .....	91
6. Salting .....	91
7. Wind Erosion .....	92
Glossary.....	93

## **LIST OF FIGURES**

Figure 1 – Locality Plan.....	3
Figure 2 – Location of Sampling Sites.....	4
Figure 3 - Isohyehts maps showing average annual rainfall.....	5
Figure 9 - Comparison of measured evaporation and calculated potential evapotranspiration for some selected stations. ....	7
Figure 3 – Patterns of growth at Mt Macedon, as influenced by rainfall, potential evapotranspiration, temperature and soil moisture storage.....	10
Figure 4 – Patterns of growth at Mt Macedon, as influenced by rainfall, potential evapotranspiration, temperature and soil moisture storage.....	10
Figure 5 – Patterns of growth at Mt Macedon, as influenced by rainfall, potential evapotranspiration, temperature and soil moisture storage.....	10
Figure 6 – Patterns of growth at Mt Macedon, as influenced by rainfall, potential evapotranspiration, temperature and soil moisture storage.....	10
Figure 7 – Patterns of growth at Mt Macedon, as influenced by rainfall, potential evapotranspiration, temperature and soil moisture storage.....	11

## **LIST OF PHOTOS**

Photograph 1 - Lime concretion.....	16
Photograph 2 — Rill and sheet erosion.....	90
Photograph 3 - Gully and tunnel erosion .....	90
Photograph 4 - Mass movement.....	91
Photograph 5 - Salt affected area .....	92
Photograph 6 - Salting due to drainage blockage.....	92

## **LIST OF TABLES**

Table I - Mean Monthly and Annual Rainfall - All years of records at each station to 1963 inclusive (mm) .....	5
Table II - Monthly maximum, minimum and mean temperature values (0 Celsius) for selected stations.....	6
Table III - Calculated potential evapotranspiration values in mm.....	7
Table IV - Effective Rainfall - Probabilities .....	8
Table V - Occurrence of frosts as indicated by screen temperatures .....	9
Table VI – Main species of formations and their distribution .....	19
Table VII - Summary of Land Systems .....	25

## **LAND SYSTEMS**

6.1      Arthurs Creek Land System.....	31
6.2      Cobaw Land System .....	33
6.3      Cottrell Land System.....	35
6.4      Darrawent Gum Land System.....	37
6.5      Djerrwarrh Land System.....	39
6.6      Doreen Land System .....	41
6.7      Footscray Land System.....	43
6.8      Greenvale Land System .....	45
6.9      Humevale Land System .....	47
6.10     Kangaroo Ground Land System.....	49
6.11     Kinglake Land System .....	51
6.12     Macedon Land System.....	53

6.13	Maribyrnong Land System.....	55
6.14	Marnong Land System .....	57
6.15	Mernda Land System .....	59
6.16	Mickleham Land System.....	61
6.17	Monegeeta Land System .....	63
6.18	Mt. Charlie Land System .....	65
6.19	Mt. Disappointment Land System.....	67
6.20	Mt. William Land System .....	69
6.21	Pretty Sally Land System .....	71
6.22	Rockbank Land System.....	73
6.23	Rockford Land System.....	75
6.24	Romsey Land System.....	77
6.25	Springfield Land System.....	79
6.26	Sunbury Land System .....	81
6.27	Whittlesea Land System.....	83
6.28	Wollert Land System.....	85
6.29	Wombat Land System .....	87

## **Appendices**

APPENDICES.....	99
Appendix 1 - Analytical Data for Selected Soils Profiles.....	100
Appendix 2 - Methods of Soil Analysis.....	103
Appendix 3 - Soil Profile Descriptions .....	104
Appendix 4 - Occurrence of Species in Land System Components Species Found within 10 Metres of Soil Sampling Site .....	108