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NATURAL AREA SYSTEM DEVELOPMENT FOR THE PACIFIC REGION

Contribution to Theme 3. Analyses of Community - and Habitat - Variation within Major Reserves

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STRUCTURE AND FLORISTIC COMPOSITION OF THE VEGETATION OF THE BOULINDA MASSIF AS AFFECTED BY EDAPHIC AND ALTITUDINAL FACTORS

The Boulinda massif of ultrabasic rocks is comparatively isolated and dominates the west coast of New Caledonia near the southern limit of the northern half of the island. It covers 150 km^2 between the altitudes of 50 m and 1300 m. Mining has only begun recently and climax plant associations still exist at all levels. The flora, almost entirely endemic, is particularly rich and contains elements characteristic of both the northern and southern parts of the island. It varies according to climatic and edaphic factors, the latter being in turn determined by the altitude and the topography (brown soils at the base, ferralitic soils at intermediate altitudes and organic " rankers " at the summit. Three groups of associations may be recognized.

I. Vegetation of hypermagnesian soils at low altitudes.

This is composed of shrubs associated with serpentine and magnesian soils. The best represented families are Myrtaceae, Cyperaceae, Apocynaceae, Euphorbiaceae, and Rubiaceae. The herb layer (Cyperaceae) is scanty. Included are :

- An association with Acacia spirorbis (highly dominant) and Plectronia paradoxa found on mixed more or less hydromorphic soils.

- An association of sclerophyllous plants including Styphelia cymbulae, Mooria canescens, and Phyllanthus montrouzieri but without dominant species found on stony eroded brown soils.

- An association poor in species dominated by Casuarina chamaecyparis and found on brown soils rich in humus and more or less eroded.

II. Vegetation on ferralitic soils.

This is very varied in structure and contains numerous species of poor more or less acid soils. The main families are Myrtaceae, Cyperaceae, Cunoniaceae, Orchidaceae, Epacridaceae and ferns.

1) Vegetation of ferralitic soils with gravel or ferruginous concretions in the upper horizon, the shrubb layer being scattered and the herbaceous layer absent. Included are :

- An association on gravelly ferralitic plateaux between 250 m and 750 m dominated by Tristania guillainii. The flora is rather poor in species. Acacia spirorbis becomes co-dominant below 350m.

- An association with Styphelia macrocarpa, Styphelia sp. and Araucaria rulei on gravelly or concretionary ferralitic plateaux between 600 m and 1000 m characterized by a very scattered tree layer of Araucaria rulei dominating a low and discontinuous shrub layer. Important floristic variations occur above 900 m.

2) Vegetation of hydromorphic ferralitic hard-pan soils, consisting of the Dicranopteris linearis and Grevillea gillivrayi association which is characterized by a continuous herb layer, dominated by Dicranopteris linearis and a low (20 cm - 50 cm) shrub layer covering at most 15% of the surface.

3) Vegetation of ferralitic soils with an upper clay loam horizon, characterized by a more or less continuous shrub layer and a well-developed herb layer (Cyperaceae), containing :

- An association with Hibbertia altigena, Homalium kanalense and Costularia nervosa on slopes between 400 m and 1000 m , distinguished by a low (20 cm - 150 m) scattered shrub layer, rich in rock plants.

- An association with Styphelia pancheri, Hibbertia lucens, Garcinia neglecta and Casuarina glaucescens on piedmont soils about 500 m, distinguished by a tall (2 m - 8 m) dense shrub layer including subsciaphilous transitional forest species.

4) Forest on humus-rich ferralitic soils (well represented above 900 m).

- Forest mainly of Myrtaceae, Lauraceae and Podocarpaceae in some gullies and on some difficultly accessible slopes between 700 m and 1100 m.

- Nothofagus forest with a monospecific tree layer in some gullies and heads of valleys between 700 and 1000 m.

- Araucaria montana forest on some ridges and slopes exposed to the wind between 900 m and 1100 m (dense thickets below tall Araucaria montana).

III. The Vegetation of organic " rankers ".

A low forest of peculiar aspect, with abundant mosses, lichens and filmy ferns, occurs above 1150 m where the climate is particularly cloudy.

The Boulinda massif is of exceptional interest both by its geographical position at the center of a highly varied floristic region and by its richness in biotopes that are as yet little affected by human activity. At a time when attention is focussed on preservation of the natural environment in the Pacific Islands, of which New Caledonia is undoubtedly one of the most remarkable, measures (reserves, fire protection, control of mining) should be taken to protect this massif against degradation provoked too often by carelessness rather than by pressing economic needs.