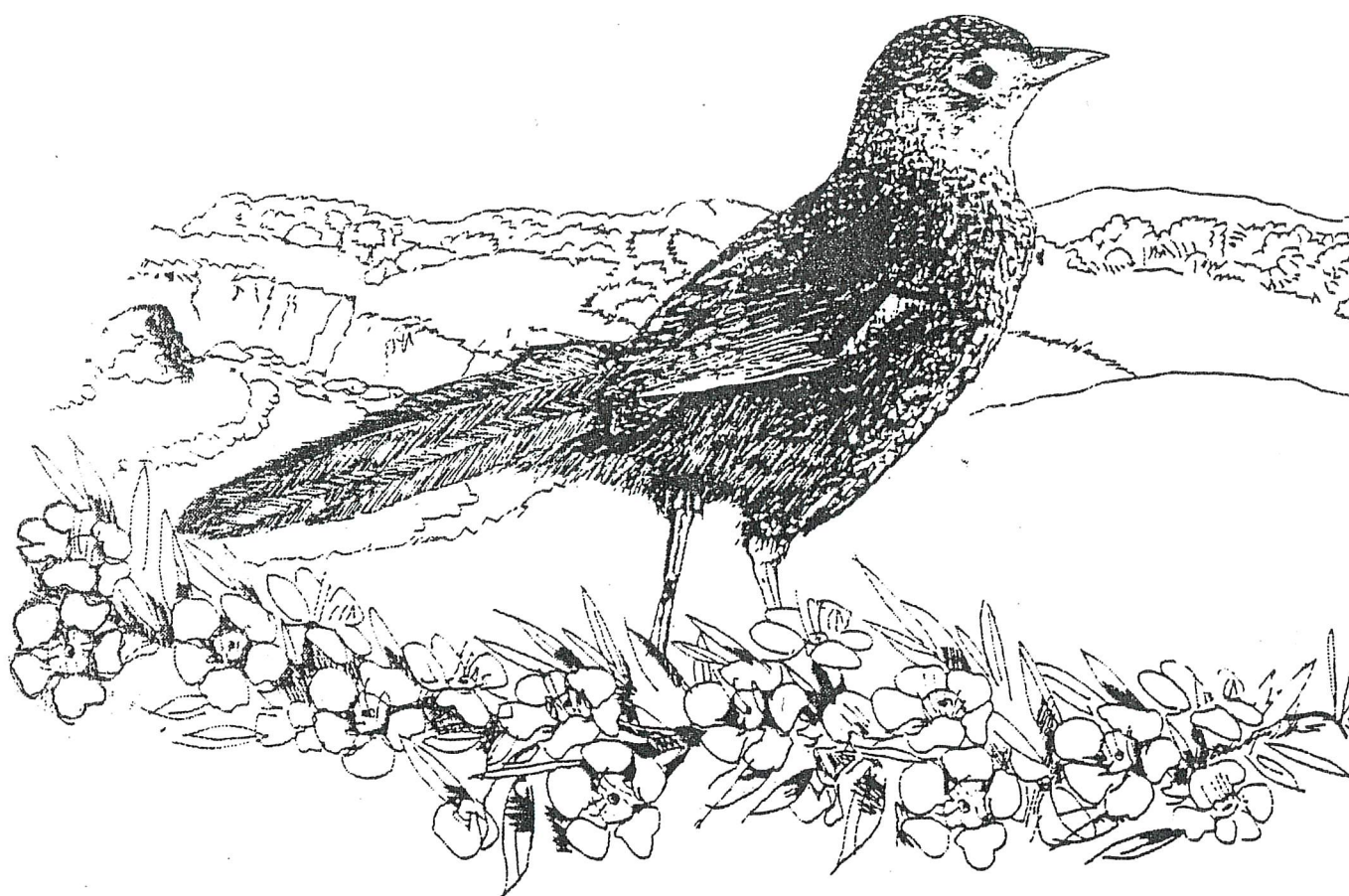


**RUFOUS BRISTLEBIRD SURVEY AND HABITAT ANALYSIS**

**PORT CAMPBELL NATIONAL PARK 1992**

**C. BELCHER**



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**RUFOUS BRISTLEBIRD SURVEY AND HABITAT ANALYSIS  
PORT CAMPBELL NATIONAL PARK**

**Introduction**

In Victoria the Rufous Bristlebird Dasyornis broadbenti has a discontinuous near coastal distribution from about Anglesea to the South Australian border. The Ash Wednesday fires (1983) may have caused local extinctions east of Cape Otway. Two extant subspecies are recognised, D.b.broadbenti from Anglesea west to about the Glenelg River and D.b.whitei from the Glenelg River west to the mouth of the Murray River (Emison et al. 1987, Parker and Reid 1978). A third subspecies D.b.litoralis, from the southwest of Western Australia, is believed to be extinct (Parker and Reid 1978).

The Rufous Bristlebird is territorial, terrestrial and sedentary (Blakers et al. 1984). It is recorded inhabiting coastal heaths and scrubs and may also occur inland from the coast in sheltered gully forests lined with woolly teatree scrub and in rainforest gullies and wet scrub under mountain ash forests (Emison et al 1987). Critical habitat or specific habitat requirements of the Rufous Bristlebird are not known.

The diet of Rufous Bristlebirds includes small invertebrates and seeds (Blakers et al. 1984) which are collected by foraging on the ground (Readers Digest 1987). Nests are dome shaped and are constructed on or near the ground in dense vegetation (Emison et al. 1987).

**Conservation Status**

The Rufous Bristlebird is classified as 'Rare in Victoria' (Baker-Gabb 1991), where Rare is defined as:-'taxa with small Victorian populations that are not at present Endangered or Vulnerable, but are at risk.'

It is also listed under the Flora and Fauna Guarantee Act 1988 on the criteria:-

- 1.1 ....it is in a demonstrable state of decline which is likely to result in extinction.
- 1.2 ....it is significantly prone to future threats which are likely to result in extinction.

## AIMS

This study is designed to:-

1. Determine the current distribution of the Rufous Bristlebird in the Port Campbell National Park and surrounding areas of remnant indigenous vegetation.
2. Determine from the results of the survey, the habitat requirements of the Rufous Bristlebird in the study area.
3. Develop management recommendations for the conservation of the Rufous Bristlebird.

## METHODS

### Survey

The Port Campbell National Park and surrounding area was systematically surveyed for Rufous Bristlebirds between July and October 1992, on the 9, 10, 17 July, 3, 4, 6, 28, 29 August and 1, 2, 3, 6, 9, 20 and 24 September. Each one minute latitude x one minute longitude block was visited at least twice during the survey.

Rufous Bristlebirds were surveyed by recording localities where birds were seen and or heard. Tapes of Rufous Bristlebird calls were also used to try to elicit responses from resident birds. The Loch Ard Gorge area was visited each time Rufous Bristlebirds were not recorded during a days survey (as Rufous Bristlebirds were known to be readily observable at Loch Ard), to determine whether the survey results were accurate or an artifact of the prevailing climatic conditions.

Areas outside the park, where Rufous Bristlebirds had previously been recorded were also surveyed.

### Habitat Analysis

Habitat requirements were determined by analysis of the floristics, vegetation structure and previous land-use history, such as fire and grazing history.

Existing vegetation data (held at the Flora Branch, Kew) was used to determine the floristic composition of sites deemed to be optimal, sub-optimal, marginal and unsuitable from the survey results. Optimal habitat was defined as a site where more than two Rufous Bristlebirds were recorded during each visit. Sub-optimal habitat was defined as a site where one and up to two Rufous Bristlebirds were recorded at each visit. Marginal habitat was defined as a site where a Rufous Bristlebird was recorded once or irregularly and unsuitable habitat was defined as a site where Rufous Bristlebirds were never recorded, and where there were no recent records. Quadrats selected for analysis were:-

Optimal habitat - D29119, D29105, D29104

Suboptimal habitat - A09063, A09064, A09021, A09023, M13029  
Marginal habitat - A09001, A09002  
Unsuitable habitat - A09003, A09004, A09005, A09066, A09067,  
A09057, A09062, A09061

Quadrat data was analysed to determine similarities between sites where Rufous Bristlebirds were recorded and differences between sites where Rufous Bristlebirds were present and sites where they were absent. Analysis was in the form of a computer-based, numerical classification procedure coupled with a hand-sorting procedure, to determine and characterize the floristic vegetation communities present, as outlined by Gullan (1978). This produced a two-way table (Table 1) classification of the vegetation which arranges quadrats according to similarity, as well as arranging plant groups commonly found in association. The table contains all species that occurred in at least 35% of quadrats.

The quadrat data was further analysed using V-NEAR, a computer based programme, which creates a polythetic-agglomerative, nearest-neighbour classification. The results of these analyses are appended (Appendix 1).

## RESULTS

### Survey

The results of the survey are presented in Map 1. On a number of days no Rufous Bristlebirds were recorded. These days usually coincided with southwesterly changes or strong winds. On each occasion, Loch Ard Gorge was also surveyed, and if no Rufous Bristlebirds were recorded, the survey was postponed until the weather moderated. The use of a play back tape of calls of Rufous Bristlebirds was also trialled. The tape was played when a bird was clearly visible. On each occasion the bird failed to respond vocally to the tape. The response was limited to the Rufous Bristlebird cocking its head before continuing to forage. It should be noted that the quality of the tape was poor due to the amount of background noises and static present.

The Loch Ard Gorge area has the greatest density of Rufous Bristlebirds in the study area and is consequently the most significant and important area for the species conservation. This area has been classified as optimal habitat for the vegetation analysis (Photo 1.). The area between Loch Ard Gorge and Port Campbell supports the next highest density of Rufous Bristlebirds and is classified as suboptimal habitat (Photo 2.). From Map 1. it can be seen that Rufous Bristlebirds were recorded from a number of relatively isolated sites. Some of these sites have been classified as marginal habitat (photo 3). Areas where Rufous Bristlebirds were never recorded, and for which there were no local records, are classified as unsuitable habitat (photo 4). A number of sites where Rufous Bristlebirds were recorded, particularly sites on freehold land and roadside verges, have no vegetation data, and require follow up botanical surveys to complete this study.

There is a possibility that the survey has precluded vegetation analysis of a number of remote or isolated sites on the basis that Rufous Bristlebirds do not currently occur at these sites. The sites may in fact contain suitable habitat, but due to their isolated position and past impacts such as predation, fire, inbreeding etc. and the species low powers of dispersal (Smith 1977) they may not have been re-colonised.

## Habitat Analysis

The majority of sites where Rufous Bristlebirds were recorded are in an open heath sub-community described by Grant (1987) as Leptospermum scoparium - Baumea juncea sub-community 4b. The vegetation analyses are presented in the appendices. The results of the analyses can be summarised as follows:-

Optimal habitat is characterised by Leptospermum scoparium, Schoenus apogon, Viola hederacea and Gahnia trifida. Mean species richness is 30 species per site, with a low incidence of weeds.

Suboptimal habitat is characterised by the same species as the optimal habitat, but with a lower species richness.

Marginal and unsuitable habitat are characterised by Leucopogon parviflorus, Poa poiformis, Oxalis corniculata, Acrotiche affinis and Centaureum tenuiflorum. Mean floristic richness is 21 species with a higher percentage of weeds.

Two nominated quadrats did not fit the analysis. These were A09021 in the suboptimal category and A09067 in the unsuitable category. Field checking revealed that floristically both quadrats should be in the suboptimal category but structurally both quadrat sites were unsuitable due to past disturbance. Each site had open, sparse, low vegetation with bare ground between plants and Poa tussocks dominant.

Rufous Bristlebirds were recorded at a number of sites outside the Port Campbell National Park for which there was no vegetation data held by the Flora Branch. The vegetation at these sites was varied, but the structure was similar. The overstorey was composed of different Eucalypt species which included:- peppermint, messmate, manna and swamp gum. The understorey included Leptospermum species, Casuarina species, Acacia species, Leucopogon species and other heath species and bracken. All the sites were similar in that the understorey was moderately dense, contained at least one species of Leptospermum and was between one and three metres high. None of the sites appeared to have been burnt recently or on a frequent basis.

## Land-use History

Fire maps of the park exist, but only record fires over the last 25 years. There is little documented information on land-use within the park before it was dedicated (1967 and 1981). Previous land use in the park was principally grazing of livestock (sheep and cattle). Squatter selections at the eastern end (Glenample Station) and the western end were not fenced off from the coastal strip which now forms part of the Port Campbell National Park. These areas were grazed by sheep and cattle and were burnt regularly (often annually) to remove the shrub layer and to promote grass growth (Grant 1987, W. O'Shea pers. comm.). The past land-use history is reflected in the present vegetation communities (Grant 1987).

The Loch Ard - Sherbrooke River area and the Two Mile Bay area appear to be the least disturbed areas in the park. This is reflected in the greater density, height and species diversity of the vegetation present at these sites. It should be noted that the Casuarina paludosa - Leptospermum juniperinum closed heath sub-community 4a (Grant 1987) at Two Mile Bay, while undisturbed, does not support Rufous Bristlebirds, or if it does, only at very low densities. This may be because it is floristically unsuitable and/or structurally unsuitable. Visual inspection of the vegetation revealed that the plant density or structural density is greater than at the Loch Ard Gorge site, and that the Casuarina paludosa is very dominant.

## DISCUSSION

The results of the Rufous Bristlebird survey confirms earlier findings that the Loch Ard Gorge area is the most significant area for the conservation of the Rufous Bristlebird in the Port Campbell National Park (Belcher and O'Shea 1991, Duncan et al. 1991). The lower Sherbrooke River and the area between Loch Ard Gorge and Port Campbell supports a lower density of Rufous Bristlebirds, but it provides a larger area of contiguous habitat and is consequently also highly significant for the conservation of Rufous Bristlebirds. The vegetation analyses identifies the Leptospermum scoparium - Baumea juncea open heath sub-community as the optimal and sub-optimal habitat in the Port Campbell National Park for the Rufous Bristlebird. This sub-community is widespread in the park (Grant 1987), and the distribution of Rufous Bristlebirds broadly follows this vegetation type. Rufous Bristlebirds were also recorded at a very low rate in Leucopogon parviflorus - Isolepis nodosa community, on sites where this sub-community is relatively undisturbed. Rufous Bristlebirds were never recorded in the Poa poiformis - Calocephalus brownii sub-community, and only from the margins of the Casuarina paludosa - Leptospermum juniperinum sub-community. They were also recorded from some roadside verges and freehold land, where the native vegetation was relatively intact, or it approximated the preferred habitat structurally.

Floristics may not determine optimal / suboptimal / marginal / unsuitable habitat. Structure may be a prime or equal determinant and other factors such as connectivity to larger areas of suitable habitat may also have a direct impact on the suitability of habitat. More detailed study is required to identify the factors involved in determining suitability of habitat. The Casuarina - Leptospermum sub community at Two Mile Bay may be floristically unsuitable, structurally unsuitable or both. Other sites may be rendered unsuitable habitat because of their isolation and lack of connectivity to other more substantial sites of suitable habitat. Local

extinction may occur at an isolated site and unless the site is connected to other areas of suitable and occupied habitat, enabling re-colonisation to occur, the site will remain unoccupied. This in turn may lead to the false classification of the site as unsuitable habitat.

The distribution of Rufous Bristlebirds within the Port Campbell National Park correlates to the previous land-use and fire regimes i.e. degree of disturbance, except for the Casuarina - Leptospermum heath at Two Mile Bay. From the time of settlement until leases were revoked (1964-1981) large areas of the park were burnt annually to promote grass growth, and grazed with livestock. This has resulted in the removal of the shrub layer and the dominance of grasses e.g. around Gibsons Steps (Photo 5). The Leucopogon - Isolepis community is a 'disclimax community' due to past grazing pressure and burning and it has been moderately to grossly disturbed (Grant 1987). Grant (1987) considers this community to be in an early temporal phase. The Leptospermum - Baumea sub-community has the greatest species diversity within the park and it is re-invading areas which were previously burnt annually, indicating that it is fire sensitive and thus susceptible to frequent burning (Grant 1987). The fire maps of the Port Campbell National Park date from 1968 and confirm that the Loch Ard Gorge-lower Sherbrooke River area has not been burnt in at least the last 25 years, and probably longer. Most of the park between Port Campbell and the lower Sherbrooke River has been burnt in the last 20 years, which may explain the differences in species richness and Rufous Bristlebird densities between the two areas. The Loch Ard Gorge area and the Two Mile Bay Area appear to be the least disturbed areas within the park. The area in between these two areas is the next least disturbed area while areas further east and west show signs of moderate to gross disturbance (Grant 1987).

In summary, within the Port Campbell National Park the Leptospermum - Baumea open heath sub-community is the optimal and suboptimal habitat for Rufous Bristlebirds. This habitat is fire sensitive and Bristlebird densities reflect the degree of past disturbance through fire, grazing and clearing. Survey results outside the Park indicate that floristics are not the sole determinant of suitability of habitat, and that structure of the vegetation is a critical factor. The key elements of vegetation structure are density and height. Connectivity to other sites may also be a significant factor in determining the suitability of the habitat at a given site.



### **ACKNOWLEDGEMENTS**

A number of people have generously assisted with this study. Bill O'Shea supplied information on the distribution of Rufous Bristlebirds both in the Port Campbell National Park and the surrounding area. Phillip Younis and others allowed access to their properties and also provided valuable records and observations of Rufous Bristlebirds. Staff at the Port Campbell National Parks office were also generous with their time and office facilities. Steve Smith, Colac region Department of Conservation and Environment and David Baker-Gabb, Flora and Fauna Branch (DCE) provided support and administrative assistance. Fiona Young, Flora Branch Kew provided access to the flora data base and ran the computer analyses.

## RECOMMENDATIONS

Little biological or ecological information is available for the species, which precludes effective management of reserves etc. Habitat destruction through the clearing of coastal scrub, wildfires and inappropriate fire regimes, grazing and slashing of unoccupied heathland for fire breaks are all thought to have reduced the species range in Victoria (Emison et al. 1987, Cox and Reilly 1990, Blakers et al. 1984). Introduced predators such as the fox and cat may exert considerable pressure on the species (Emison et al. 1987, Duncan et al. 1991).

### General Recommendations:-

1. Funding be sought under the Flora and Fauna Guarantee to undertake the following recommendations.
2. Further survey work be undertaken to determine the status and distribution of Rufous Bristlebirds outside the Port Campbell National Park.
3. Botanical surveys be conducted at those sites found to support Rufous Bristlebirds outside the Port Campbell National Park, and the data analysed to further determine the habitat requirements of the Rufous Bristlebird.
4. Similar surveys be conducted in the Geelong and Portland regions to cover the Victorian range of the Rufous Bristlebird and to enable an estimate of the species population size.
5. No further development should occur in areas where Rufous Bristlebirds are known to occur. The Loch Ard Gorge area and

the lower Sherbrooke River area should not have any further development. The present roading, walking track and carpark developments have encroached on Rufous Bristlebird habitat, and may have further opened up the habitat enabling increased access for introduced predators. Similarly Crown allotment 21A Township of Port Campbell should not be alienated, as it provides habitat for Rufous Bristlebirds and it forms part of a wildlife corridor connecting the park to other vegetated areas.

6. An education programme should be instigated to promote awareness in residents and visitors of the impact their domestic pets may have on endangered or threatened species such as the Rufous Bristlebird and the Swamp Antechinus.

7. Key roadsides and unused roads leading out of the Port Campbell National Park should be revegetated (if necessary) and protected from stock, to form habitat corridors and to connect sites where Rufous Bristlebirds have been recorded.

8. Existing or potential Rufous Bristlebird habitat on freehold land should be fenced to exclude stock. Landowners should be approached by the Department through the Land for Wildlife Officer to encourage the preservation of Rufous Bristlebird habitat, where the Department meets the cost of the fencing.

10. Fire should be excluded from those areas where Rufous Bristlebirds have been recorded, until such time as critical habitat requirements are known.

#### Port Campbell National Park Recommendations:-

1. A monitoring programme be instigated to monitor the number of Rufous Bristlebirds at selected sites within the Port Campbell National Park:-

a). at sites of greatest density to determine whether populations are stable.

b). at sites of suboptimal habitat to determine whether changes/improvements are matched by a corresponding increase in density/population size of Rufous Bristlebirds.

2. Systematic predator controls should be instigated immediately to reduce the predation pressures on the species. Flora and Fauna Guarantee funding should be allocated to the Land Protection Officers budget to enable the predator control

programme to be adequately organised.

3. The vegetation particularly in the more disturbed areas of the Port Campbell Park as identified by Grant (1987) should be monitored to determine the rate of recolonisation by the Leptospermum - Baumea sub-community.

4. A rabbit control programme be instigated within the Port Campbell National Park and the surrounding landowners should be encouraged to form a rabbit control group.

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Photo 1. Optimal habitat, Loch Ard Gorge area.



Photo 2. Suboptimal habitat, west of Rutledge Creek.

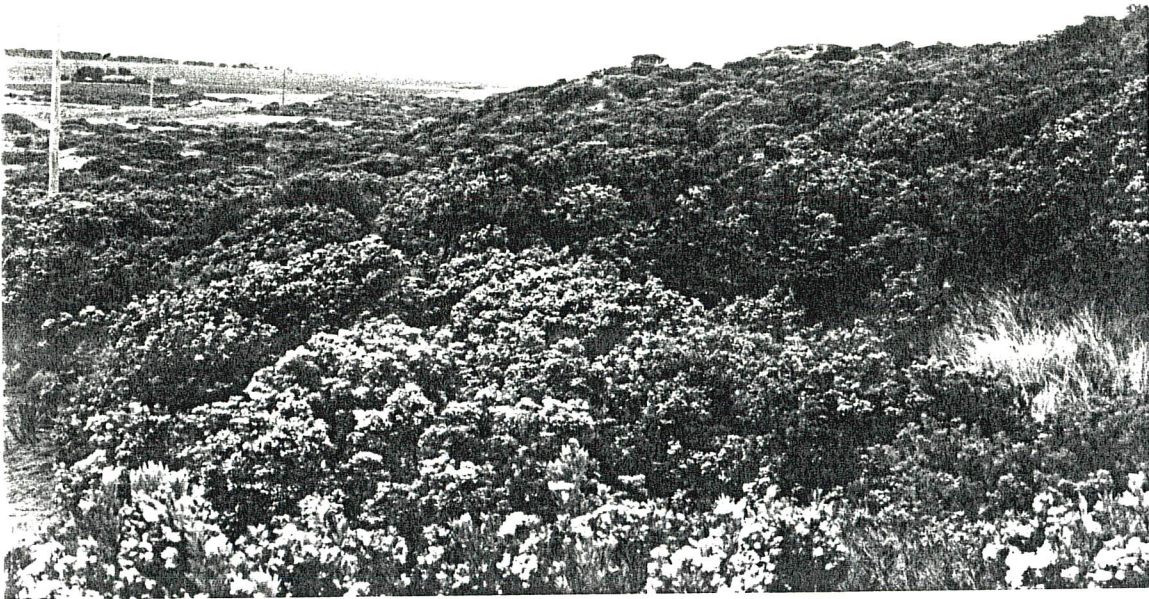


Photo 3. Marginal habitat, east of Peterborough.



Photo 4. Unsuitable habitat, between Gibsons Steps and the Twelve Apostles.

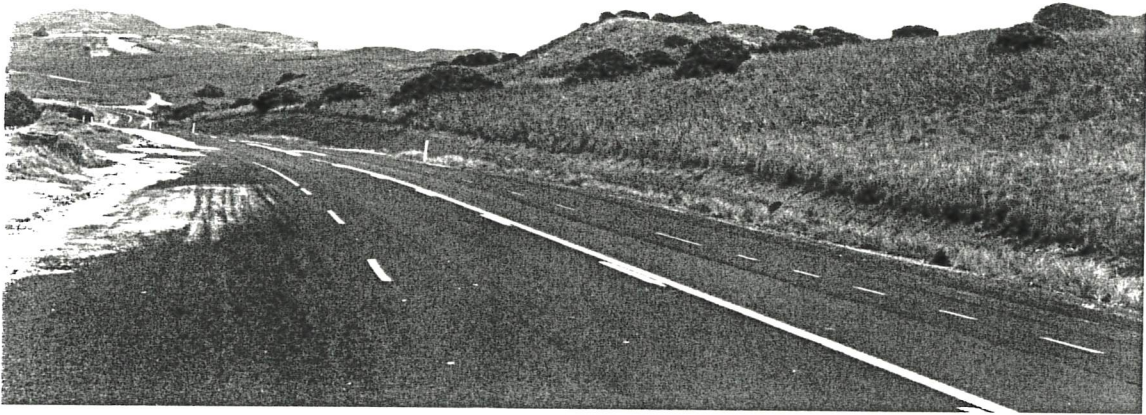


Photo 5. Gibsons Steps



TWO WAY TABLE - SELECTED RBB SITES

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		000000002221000000					
		9999999999993999999					
		000000001110000000					
		260560660012260006					
		335724674599141231					
118	Acrotriche affinis	1++1+1	+	++			Ridged Ground-berry
705	*Centaurium tenuiflorum	1++++++		++			Centaury
1987	Leucopogon parviflorus	+1++12	++212	2	2		Coast Beard-heath
2379	Oxalis corniculata spp. agg.	+++++++		++			Yellow Wood-sorrel
2553	*Plantago coronopus	+++					Buck's-horn Plantain
2605	Poa poiformis	444+2	+	+11+2+++			Blue Tussock-grass
100	Acacia verticillata	21	+++	++			Prickly Moses
106	Acaena echinata	+++					Sheep's Burr
363	Banksia marginata	1	433	11	+1		Silver Banksia
377	Baumea juncea	2	11	1++	+		Bare Twig-sedge
1489	Gonocarpus tetragynus	+	2++	++			Common Raspwort
8260	Gonocarpus tetragynus	1+					No Common Name
123	Acrotriche serrulata			1+++	+		Honey-pots
702	*Centaurium erythraea			+++1			Common Centaury
1397	Gahnia trifida	1	13	++3+2	+		Coast Saw-sege
1965	Leptospermum scoparium	4		1534434			Manuka Tea-tree
2024	Lobelia alata			+++1			Angled Lobelia
3039	Schoenus apogon	1	+++1+2+1				Common Bog-sedge
3528	Viola hederacea		+++++++				Ivy-leaf Violet
304	Astroloma humifusum			+ 1++			Cranberry Heath
832	Correa reflexa	+		1 ++			Common Correa
3235	Spyridium parvifolium		+	+ 1+			Dusty Miller
1524	Gratiola peruviana				+1++		Brooklime
1723	Hydrocotyle laxiflora		+		1+ +		Stinking Pennywort
1782	Isolepis nodosa	1			2442		Knobby Club-sedge

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LARGE GROUP 1

CHARACTER SPECIES	%FRQ C/A	CHARACTER SPECIES	%FRQ C/A	CHARACTER SPECIES	%FRQ C/A
STRUCTURE:					
NUMBER OF SITES: 2					
DISTRIBUTION:					
ENVIRONMENT:					
ALTITUDE: Mean = 58m, Highest = 70m, Lowest = 45m					
MEAN FLORISTIC RICHNESS: 10 species per site			MEAN WEED COMPOSITION: 0% of species, 0% of cover		

LARGE GROUP 2

CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A
Acrotriche affinis	100	1	Leucopogon parviflorus	100	1	Poa poiformis	100	3
*Centaurium tenuiflorum	100	+	Oxalis corniculata spp. agg.	100	+	Viola hederacea	80	+

NUMBER OF SITES: 5

STRUCTURE:

DISTRIBUTION:

ENVIRONMENT:

ALTITUDE: Mean = 38m, Highest = 70m, Lowest = 25m

MEAN FLORISTIC RICHNESS: 21 species per site

MEAN WEED COMPOSITION: 12% of species, 2% of cover

LARGE GROUP 3

CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A
Leptospermum scoparium	100	4	Viola hederacea	100	+			
Schoenus apogon	100	1	Gahnia trifida	85	2			

NUMBER OF SITES: 7

STRUCTURE:

DISTRIBUTION:

ENVIRONMENT:

ALTITUDE: Mean = 37m, Highest = 60m, Lowest = 22m

MEAN FLORISTIC RICHNESS: 30 species per site

MEAN WEED COMPOSITION: 7% of species, 2% of cover

LARGE GROUP 4

CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A	CHARACTER SPECIES	%FRQ	C/A
Gratiola peruviana	100	1	Poa poiformis	100	1			
Isolepis nodosa	100	3	Hydrocotyle laxiflora	75	+			

NUMBER OF SITES: 4

STRUCTURE:

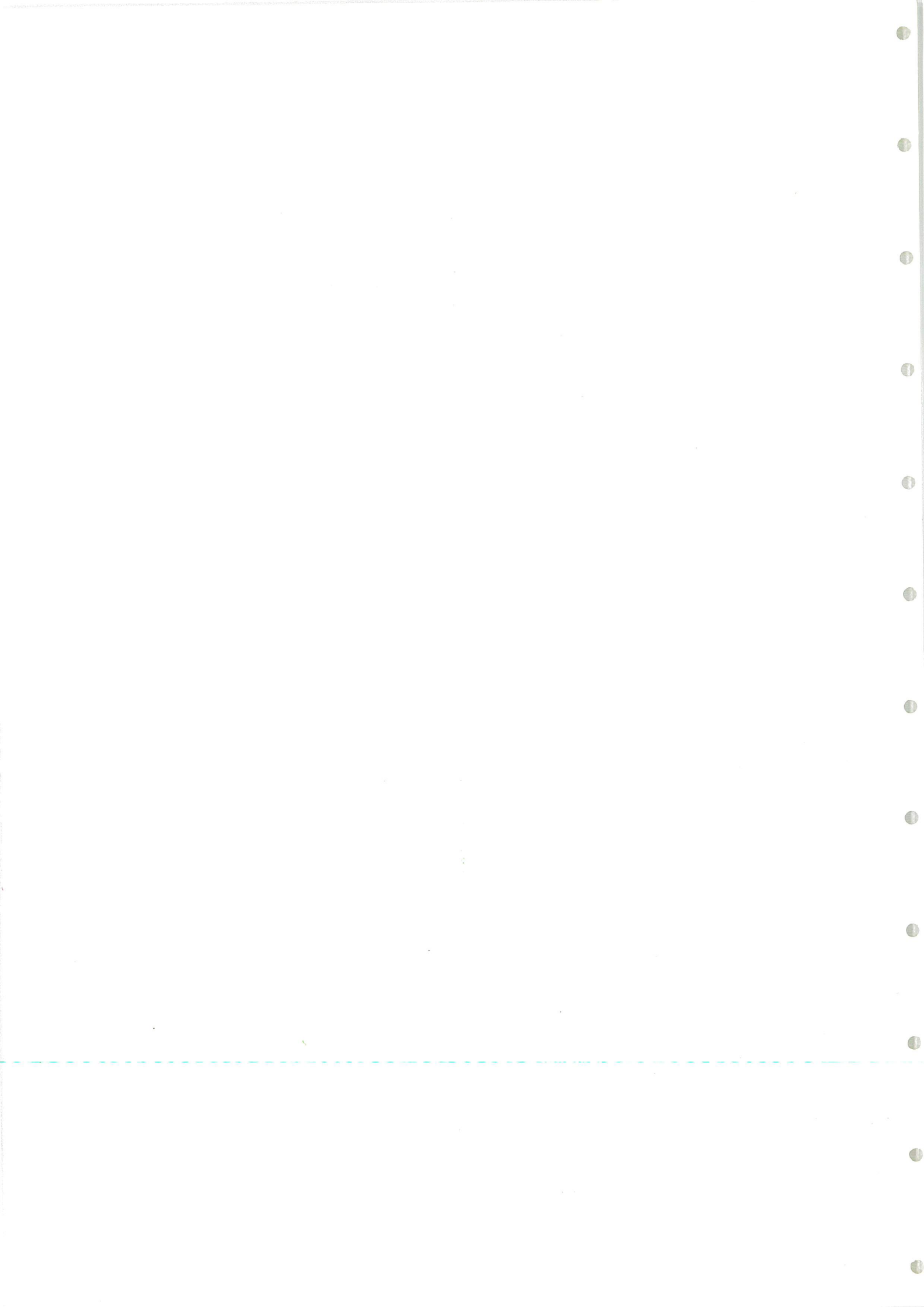
DISTRIBUTION:

ENVIRONMENT:

ALTITUDE: Mean = 28m, Highest = 35m, Lowest = 15m

MEAN FLORISTIC RICHNESS: 12 species per site

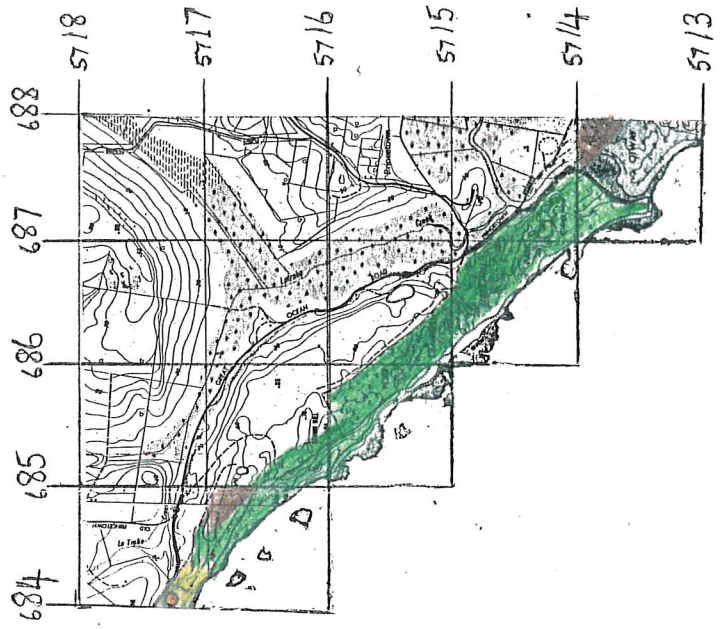
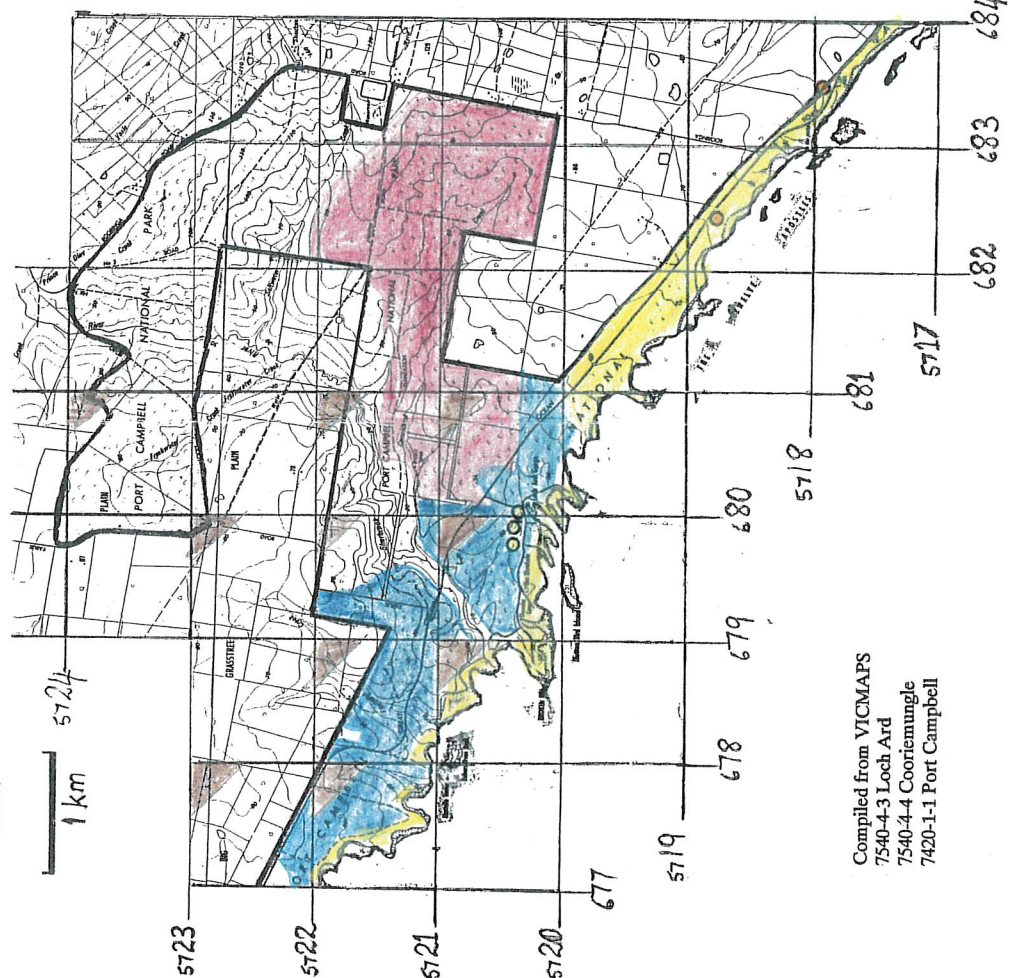
MEAN WEED COMPOSITION: 16% of species, 19% of cover





**MAP 1**  
**Rufous Bristlebird Survey and Habitat analysis - Port Campbell National Park 1992.**

- Flora Quadrat Site Optimal Habitat
- Flora Quadrat Site Sub-Optimal Habitat
- Flora Quadrat Site Marginal Habitat
- Flora Quadrat Site Unsuitable Habitat
- ▲ 1km grids where bristlebirds were located during the survey
- *Leptospermum scoparium* - *Baumea juncea* community - open scrub Optimal/Sub-Optimal Habitat
- *Leucopogon parviflorus* - *Isolepis nodosa* community - open scrub Marginal Habitat
- *Poa polyformis* - *Calceopholus brownii*/*Distichlis distichophylla* sub communities Unsuitable habitat
- *Casuarina patulosa* - *Leptospermum juniperinum* sub community - closed heath Unsuitable habitat except margins



Compiled from VICMAPS  
 7540-4-3 Loch Ard  
 7540-4-4 Coorierungle  
 7420-1-1 Port Campbell

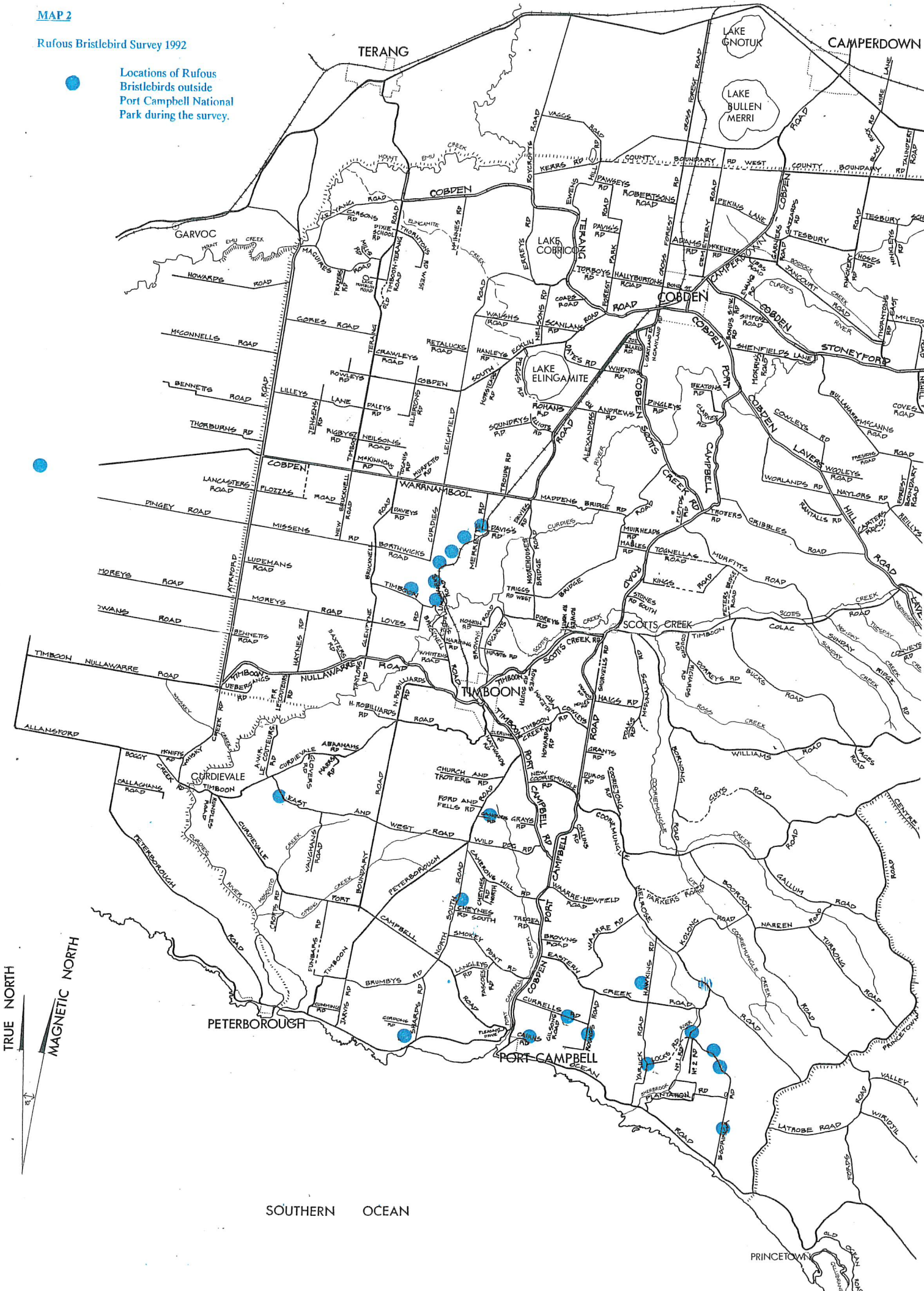
Vegetation map produced from Port Campbell National Park Management Plan, DCE 1990.



MAP 2

Rufous Bristlebird Survey 1992

Locations of Rufous Bristlebirds outside Port Campbell National Park during the survey.



SOUTHERN OCEAN

PRINCETOWN