

A PLAN FOR THE RESERVATION AND DEVELOPMENT

OF A SECTION OF THE SOUTH COAST

OF WESTERN AUSTRALIA

Prepared by F.J. Bradshaw, R.J. Underwood, S.J. Guain,

B.J. White and D.E. Grace

OFFICERS OF THE FORESTS DEPARTMENT OF WESTERN AUSTRALIA

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## SUMMARY

A study has been made of a section of the lower south west coast of Western Australia. The basis of the work is the firm belief that the best long-term use of the area is for recreational purposes.

In this submission, proposals for secure reservation of the area are made, the area is described and a master plan for its development is put forward.



1. PREFACE

This report deals with a tract of land between Cape Beaufort and Walpole on the south coast of Western Australia. This area is remarkable in that it is a place of great natural beauty, scientific interest and with outstanding recreation potential; it is reasonably close to the major population centres of the State and yet it is still mainly undeveloped and largely unknown. The majority of the area is virgin coastal bushland and forest, and the remainder little altered by the activities of man or by the presence of exotic plants and animals.

The prime motivation for this submission is the writers' belief that the resources of this area can be best utilised in the production of recreation and inspiration for the people of Western Australia. This goal can only be achieved by the dedication of the area as an "A Class" Reserve, thus ensuring public access to it in perpetuity.

The alternative is to consider what will happen to the area if reservation is not made. A primary danger is alienation for agricultural pursuits. In recent times, many miles of coastal country east of Augusta and south of the Scott River have been alienated for farming, thus effectively and permanently denying public access to the beaches. A second threat is posed by the mining industry. Mineral sand deposits are known to exist within the area and a considerable amount of lease pegging took place in 1969 and 1970. The recommendation of the Committee of Enquiry into the Mining Act (1971) for the reservation from mining of a forty chain strip of coast is encouraging, but falls far short of providing adequate protection for the area proposed for reservation in this report. The third problem is that of the uncoordinated development by various authorities of the recreational facilities in the area. For example there is the development of Windy Harbour by the Shire of Manjimup, the piecemeal expansion at the mouth of the Donnelly River and several other places by private individuals "squatting" on crown land, and the work near Walpole by the W.A. National Parks Board.

Clearly the most effective use can be made of the area for recreation if development is properly planned and coordinated.

In conclusion, it is emphasised that a precious and perhaps final opportunity now exists to plan and control the development of this area. If this opportunity is let slip, then the natural forces of piecemeal demand, unplanned alienation or mining will inevitably and irreversibly erode the natural values of the area.

In the report which follows, the area proposed for reservation is described and the justifications for the reservation are amplified. A model for its development is proposed and recommendations made as to how this development should take place.

## 2. INTRODUCTION

### 2.1 JUSTIFICATION OF THE PLAN

The lower south west coast, between Cape Beaufort ("Black Point") and the Nornalup Inlet is the last remaining area in the more densely populated portion of Western Australia where the planned development of a coastal area is possible. Along the coast from Cape Beaufort westward to Cape Leeuwin, all except a narrow strip of beach has been alienated, portions within the last few years. East from Nornalup Inlet, alienation of coastal land has proceeded to a point where the natural character of the land has been irreversibly changed.

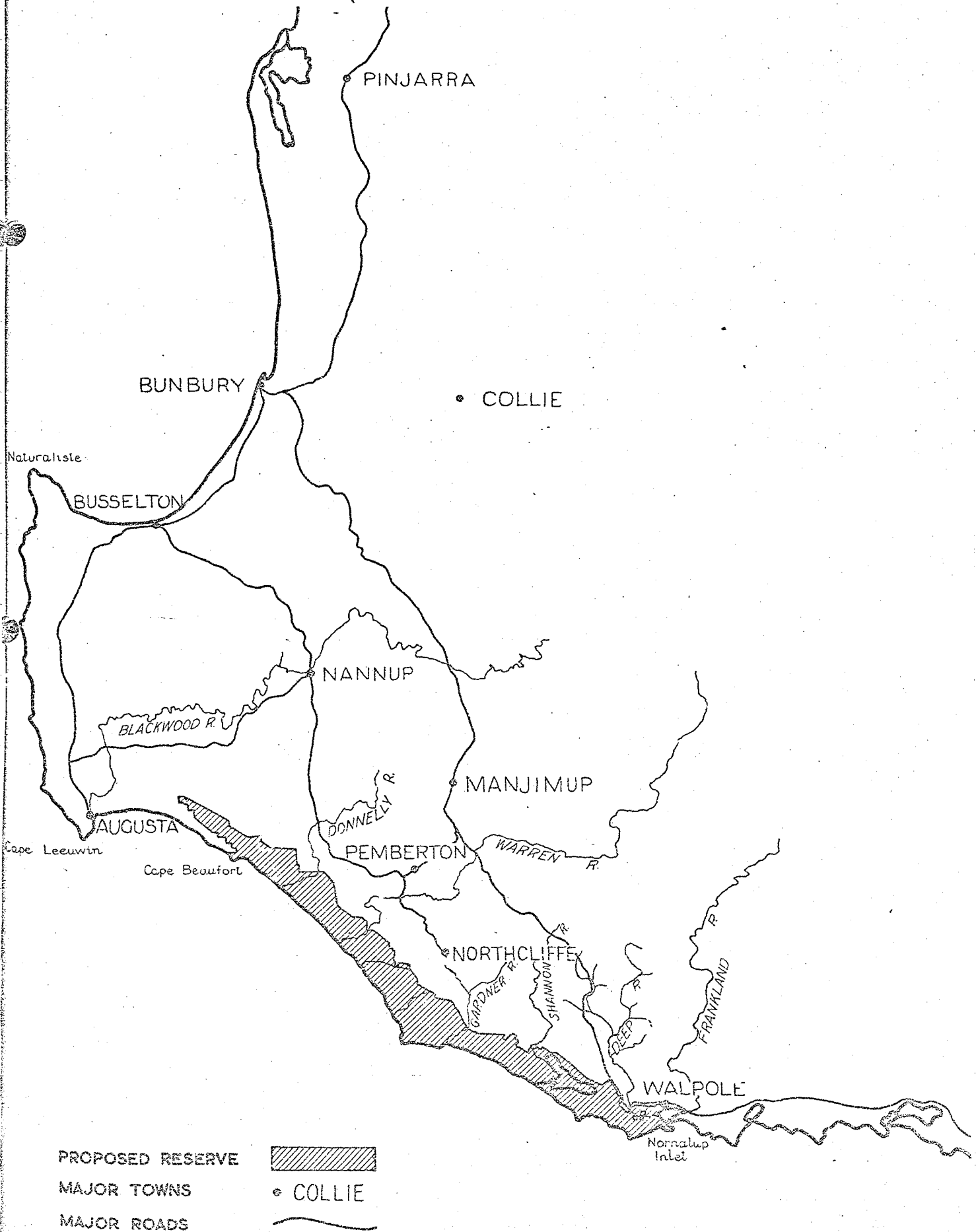
The coastal tract which is the subject of this report (see Figure 1, page 5) is still mainly vacant crown land. It is characterised by a number of features which enrich its potential for recreation and scientific study. Some of these features are:

- i) The natural character of the area has to date been largely unaffected by human activity.
- ii) There is magnificent coastal scenery: broad white beaches, high rocky cliffs and headlands, waterfalls, coastal lakes and massive sand dune formations.
- iii) There is a varied, interesting and at times spectacular flora. The fauna population is both interesting and readily visible.
- iv) Five major south west river systems empty into the sea along this coastline.
- v) The area proposed is large enough, and sufficiently free from human development to promote a sense of solitude, release and adventure to those who desire a retreat from the pressures of urban living. At the same time, the area is not so remote from

FIGURE I.

# APPROXIMATE POSITION OF PROPOSED RESERVE

SCALE: 20 MILES TO AN INCH.



population centres to put it beyond the reach of the weekend and holiday visitor.

- vi) Historical interest can be found within the area. The first part of the State formally annexed to the British Crown by Captain Vancouver in his expedition of 1791 was at Chatham Island, southwest of Nornalup Inlet. In 1792, Admiral d'Entrecasteaux landed near what is now Windy Harbour and the headland there bears his name.
- vii) The area has the mildest climate in Western Australia, a state which every summer is subject to prolonged periods of heat and dessication.

The ultimate justification for the reservation of this area can be stated quite simply: here is a beautiful and mainly undeveloped tract of coastline. If it is accepted that community recreation and the conservation of certain interesting land forms are vital needs to be catered for in the south west, then such an area as this one must immediately be reserved from encroaching alternative land uses.

## 2.2 OBJECTIVES OF THE PLAN

This plan has been formulated and the report written with the following objectives in mind:

1. To highlight the urgent necessity to reserve from alienation and exploitation a unique and important coastal area.
2. To produce a model scheme of development for the area, so designed as to cater for the dual needs of conservation and recreation.
3. To recommend the most practical means by which the proposals can be implemented.

2.3 DESCRIPTION OF THE AREA

2.3.1 SIZE AND TENURE

The proposed reserve has an area of approximately 283,000 acres. This includes land of a variety of tenures, but is predominantly vacant crown land and crown reserves vested for miscellaneous purposes.

Acreages of the various land tenures within the proposed reserve are shown in Table 1, below, and illustrated on Plan 1 in Appendix 2.

TABLE 1

TENURES WITHIN THE PROPOSED RESERVE

Tenure	Approx. Area	% Total
1. State Forest	2,000 acres	1
2. National Park	17,000 acres	6
3. Vacant Crown Land	177,000 acres	63
4. Miscellaneous Reserves	75,000 acres	26
5. Private Property	12,000 acres	4
Total	283,000 acres	

Note that category 3, Vacant Crown Land, includes 42,000 acres leased for grazing, 1,300 acres approved for alienation as private property and 12,000 acres of water surface. Category 4 includes a number of vestings, including Public Utility, Camping and Recreation, Industrial Purposes, Experimental Farm and Timber Reserves.

In addition, 33,000 acres within both Vacant Crown Land and other reserves are proposed for inclusion in State Forest.

It is important to realise that a number of features of interest to the recreationist and the naturalist are located within tenures other than vacant crown land or crown reserve. This problem is discussed later in the report.

### 2.3.2 LOCATION AND SETTING

The proposed reserve comprises approximately 95 miles of coastline together with a strip of land three to five miles in width extending inland from the sea. The inland boundary is an irregular line adjoining a variety of tenures, including State Forest, private property and vacant crown land. Its location ensures the representation of the entire ecological range from beach pioneers to wet sclerophyll forest and the inclusion of all major features of recreational and physiographic interest.

There are numerous features of remarkable interest within this area. Among the most important of these are:

- i) Broke Inlet, one of the largest inlets on the Western Australian coast.
- ii) Many large, fresh water lakes which abound in native water fowl. These include Lakes Maringup, Jasper, Yeagarup and Doggerup.
- iii) The peppermint woodland, a fascinating and beautiful formation which occurs on the anchored dunes just inland from the sea.
- iv) Malimup, where fresh water springs occur within yards of the sea and waterfalls cascade from the cliff tops.
- v) The Meerup and Yeagarup Dunes, vast unconsolidated sand masses, unique in the south west of the State.
- vi) Mount Chudalup and Black Point, geological structures of considerable interest.
- vii) The mouths of the Donnelly, Warren, Meerup, Gardner, Shannon and Deep Rivers.

There are also a number of popular recreation centres within the area, for example the Nornalup National Park, Windy Harbour and the Donnelly River mouth. Beach and rock fishing, marroning, hiking and camping are popular at many points along the coast.

A most important feature of the proposed reserve

is that within its boundaries are many large areas which are completely uninhabited and undeveloped. Such "wilderness" areas are now becoming increasingly hard to find along the coast of south-western Western Australia, and their protection is of prime importance.

### 2.3.3. CLIMATE AND PHYSIOGRAPHY

The area has a mild climate with a mean annual temperature of approximately 60°F and a mean annual rainfall of about 60". Rainfall effectiveness is higher here than in any other part of the State.

Soils cover a wide range from unconsolidated sand to fertile, red soils derived from basalt. However, light textured, generally infertile soils predominate in the area. Much of this soil type is waterlogged throughout the winter, spring and early summer.

A variety of vegetational types occur within the area. The four major types are:

- i) The pioneer communities, mainly spinifex, pig-face and marram grass (the latter predominates near the mouth of the Warren River, where it was introduced for sand dune stabilisation in the 1930's), associated with the beach and dune systems.
- ii) The scrub and woodland communities of the stable dunes. The major tree species are peppermint, yate, bullich, jarrah and banksia together with understorey associations of scrub and windflower species.
- iii) The swamp communities which are found in the broad, wet flats which occupy the lower topographical positions. These are dominated by members of the family Restionaceae. The most notable of the swamp species is the native bottlebrush (Beaufortia spp.) which blooms in mid-summer.
- iv) The wet sclerophyll forests of karri, marri and jarrah found growing on the better soil types.



The area can generally be classified into five major land form categories: forest, water surface, woodland and scrub, unconsolidated sand and flats. The distribution of these land form types is shown on Plan 2 in Appendix II, and their relative areas in Table 2, below:

TABLE 2

MAJOR LAND FORMS

Category	Area	% of Total
Forest	15,000 acres	6
Water surfaces	12,000 acres	4
Woodland/scrub	131,000 acres	46
Unconsolidated sand	38,000 acres	13
Flats/swamps	87,000 acres	31

The total length of coastline in the proposed reserve is 95 miles, of which 49 miles are beach and 46 miles are cliffs.

In Appendix I detailed descriptions are given of the most interesting and important physiographic features in the area.

2.3.4 FAUNA

The author's knowledge of fauna is limited but more detailed knowledge should follow from work proposed by the Forests Department in April, 1972.

One aspect, however, is worthy of mention at this stage - the open nature of the scrub and woodland communities allow the kangaroo and emu to be observed more readily than in the heavier forest communities further inland.

### 2.3.5 ACCESS

The proposed reserve is accessible for conventional two-wheel drive vehicles in very few places; only at Windy Harbour can the sea be reached in such a vehicle at all times of the year. However, the conventional vehicle can penetrate the area at numerous places, for example: Lake Yeagarup, the Callcup area, Chesapeake Road, Broke Inlet and sections of the Nornalup National Park.

Many other points can be reached with a four-wheel drive vehicle. Rough tracks, sandy in the summer and boggy in winter have been established in numerous places over the years by cattle drovers, fishermen and in some cases by the Forests Department for fire control purposes. Examples of places which can be reached by such tracks are Black Point, the Warren Beach, Malimup Springs, Fish Creek, and Banksia Camp.

The mouths of the Donnelly River and Broke Inlet can be reached by small motor boat.

The recent upsurge in the use of the "beach buggy" must be mentioned. These specialised vehicles can reach nearly any point on the coast and there are now dozens of them in common use along the beaches and up on the dunes. In most cases beach buggy owners are keen amateur fishermen whose main objective is to reach the beaches and start fishing; consequently the effect on the environment at this stage is probably insignificant. However, as the ownership and use of buggies expands, there will be a need to control them. The restriction or even prohibition of buggies from some sections of the coast will probably become necessary in time, if serious erosion problems are to be avoided.

### 2.3.6. CURRENT DEVELOPMENT

#### 2.3.6.1 Recreational Development

Facilities for community recreation are generally poorly developed in the proposed reserve. For the average visitor this is mainly a function of lack of

good access; for the owner of a Land Rover or beach buggy this problem is not so relevant.

Apart from the long established township of Walpole at the extremity, the most highly developed recreational area in the proposed reserve is at Windy Harbour. Here there is a small weekend and holiday settlement comprising about 120 cottages of variable quality, an area set aside for caravans and camping, changing rooms, ablutions and boat-ramp facilities. There are no shops or other services. The settlement is administered by the Shire of Manjimup operating through a Board of Control which is made up of several cottage owners. The status of the Windy Harbour settlement and its future development are currently under review by Lands and Town Planning Departments.

The second most highly developed area in the proposed reserve is at the mouth of the Donnelly River where there is a small settlement of about 20 cottages. This area has no official status, cottage owners being squatters on crown land.

There are also small, unofficial groups of huts at several other places along the coast. For example, Malimup Springs, the mouth of the Gardner River and Broke Inlet.

A small, but rather notable recreational facility in the area is the "sleeper track", a primitive road in to the Warren Beach area constructed of railway sleepers by the Pemberton Angling Club. This facility has provided countless fishermen with all-year access into one of the best beach fishing spots on the coast. The boat ramp on the Donnelly River is a further example of spontaneous and useful community effort.

To summarise: recreational developments in the proposed reserve at the moment are, with the exception of Windy Harbour, the results of rather haphazard individual efforts. These have no official status, nor is any formal control exercised over them.

#### 2.3.6.2 Pastoral and Agricultural Development

Although more than 12,000 acres in the proposed reserve is private property, not more than 200 acres of this is actively farmed. The remainder is either completely undeveloped or used periodically for summer cattle grazing.

Approximately 42,000 acres of vacant crown land in the area are held as Pastoral or Grazing Leases. Some of these leases are current to the year 2015.

Many of the most interesting and beautiful places in the proposed reserve are either within private property or on crown land which has been leased for grazing purposes. Examples of these are Malimup Springs, the southern shore of Lake Maringup, the limestone cliffs east of Black Point, the peppermint grasslands north of Fish Creek and the Yeagarup sand dunes.

#### 2.3.6.3. Mining Development

There is no current mining activity in the proposed reserve. Oil is believed to have been located near the mouth of the Warren River early in the century, but the resource was apparently uncommercial as no development took place. Coal is known to occur in the Flybrook area, some of which is within the boundaries of the reserve.

Great interest has been shown by prospectors in deposits of mineral sands in recent times. The entire area was prospected over in 1969 and 1970. Mining lease pegs can be seen in many places and unofficially it is believed that the entire dune system between the Donnelly River and Windy Harbour was pegged.

#### 2.3.6.4. Forestry Development

No major forest development work has been carried out within the proposed reserve. The Forests Department carried out important and highly successful sand dune

stabilisation work near the mouth of the Warren River in the 1930's and in more recent times has established small trial plots of coniferous tree species along the dune system.

The Department has also constructed and maintains a number of minor roads in the area for the purposes of fire protection work and access to State Forests. Over many years they have borne the brunt of fire suppression and pre-suppression work in the area. In 1970, the Department installed a fire lookout on Callcup Hill and this is manned through the summer months.

Approximately 33,000 acres of vacant crown land within the area is proposed for inclusion in State Forest.

#### 2.4 RECREATION NEEDS IN THE AREA

The number of people who currently use the area for recreation is not known; no surveys have ever been done. It is therefore impossible to make accurate projections of future use.

Observations by numbers of people, however, lead to the reasonable conclusion that recreational use of the area is expanding at a rapid rate. A good indicator is at Windy Harbour, where the settlement has grown from four to one hundred and sixty cottages since 1945. This expansion is a function of increased population size and affluence, increased leisure time and improvements to the access in the area.

The populations of the rural communities close to the proposed reserve are now relatively stable. These communities however, are progressively becoming more mobile and increasingly augmented in the peak holiday periods by large numbers of visitors from the metropolitan area, other rural districts and interstate.

It is reasonable to predict a steady and persistent increase in the pressure for recreational facilities in the area in the future. This pressure will

intensify when coastal recreation areas on the west coast (Cape Leeuwin to Yanchep) reach saturation point probably well before the year 2000.

Visitors to the area, seeking recreation, will demand a number of traditional outlets for their vacation period. These will include:

- i) Sites for holidaying, camping and picnicking.
- ii) Boating facilities.
- iii) Beach, rock, inlet and river fishing.
- iv) Open space - undeveloped areas, for hiking and exploring and the retreat from civilization.
- v) Features of natural and historic interest.

In the next section of this report, an attempt is made to demonstrate how these requirements can be met while conserving the natural character of the area.

### 3. PROPOSED DEVELOPMENT

#### 3.1 DEFINITION OF TERMS

The most difficult problem in planning the development of the proposed reserve is to avoid major impairment of the natural environment while at the same time satisfying the recreational needs of the public. Clearly there is no perfect solution to this problem as any development will effect the environment in some way.

The answer is to compromise by the subdivision of the area into recreational use categories. Three "use zones" have been chosen: areas are classified for full development, partial development to certain defined limits, or no development.

The terminology adopted and their definitions are as follows:

Zone 1 Developed Area: "An area accessible by first class road wherein the full range of recreational facilities may be developed. Townships may be built, together with facilities for camping, caravanning and sporting activities."

Zone 2 Limited Development Area: "An area into which certain specified access roads may be constructed and where there will be facilities for picnickers and day-visitors. Facilities for overnight camping and other accomodation will not be provided, at least in the initial stages of development."

Zone 3 Wilderness Area: "An area through which there are no roads and in which all mechanised vehicular access is prohibited. There will be no facilities for camping or picnicking. Total prohibition of access into some areas may even be necessary as a short term measure if this is found to be necessary for the conservation of some unique element of the

environment."

The creation of these zones is the basis of the development plan of the area.

### 3.2 PROPOSED ZONATION

It is recommended that the proposed reserve be subdivided into the three zones defined above. On Plan 3 in Appendix II, the proposed zonation is shown.

#### 3.2.1 ZONE 1: DEVELOPED AREAS

Four sites are nominated for classification as Zone 1. In these areas the maximum development of recreation facilities can be made. The recommended sites are Windy Harbour, "Camfield Townsite" (Broke Inlet), the mouth of the Donnelly River and Black Point.

With each of these areas except the mouth of the Donnelly (see below) it is recommended that the following steps are taken: declaration of a townsite, preparation of a town plan, construction of an access road to arterial standards and provision of essential services and facilities. The Donnelly mouth is exceptional in this category in that it is not recommended that an access road be constructed into the area. A unique feature of this site is that access can only be obtained by the seven mile boat trip down the river from the boat landing. It is essential that this unique feature be retained.

The declaration, planning and administration of townsites presents many problems, and the writers of this report are not qualified to make detailed recommendations in this field. Nevertheless, in a consideration of the problem several basic points emerge and these can be noted.

- i) There will be increasing pressure for holiday settlements on the coast. Windy Harbour is already reaching saturation and unofficial



settlements have begun to spring up at other points.

- ii) It is highly desirable to channel this pressure into defined townsite areas where their growth can be organised and controlled.
- iii) It is realistic to expect that declared townsites at Windy Harbour, Broke Inlet, the mouth of the Donnelly and Black Point will adequately cope with the demand for this facility, at least for the foreseeable future (i.e. to the year 2000), especially when it is remembered that Walpole, on the south-eastern edge of the proposed reserve, is a well established township amenable to much wider development.
- iv) These townsites must be based on approved town plans, must satisfy Public Health and Local Government requirements and must have a maximum size placed on them.
- v) Townsite blocks should be offered on a leasehold rather than freehold basis. This will keep out the real estate dealers and the speculators and keep such areas within the financial capacity of the ordinary man.
- vi) Townsites and their access roads and facilities should be under the control of the local Government body in whose shire they occur.

These are matters to be resolved at high levels. But what is clear at this point in time is that the expansion of the squatting settlements at the Donnelly and Broke Inlet should be immediately halted pending further developments along the lines put forward in this report.

### 3.2.2. ZONE 2: LIMITED DEVELOPMENT AREAS

Limited development, involving the construction of access roads to sub-arterial standards (see section 3.3 for road classifications), and facilities for day-visitors and picnickers will be permitted in areas classified into

Zone 2. These areas and the recommended location of access roads into them are shown on Plan 3 in Appendix II.

Roads of good quality into these areas are essential. Not only will this permit all-year use, but will also be an important means of conserving the environment. Poor quality or inadequate roads encourage the four-wheel drive or beach buggy enthusiast to "Make his own track" with consequent damage to soil, vegetation and scenic values.

The placement and design of picnic grounds, parking areas and toilet and garbage facilities is of critical importance. They must be inconspicuously sited and blend with the landscape rather than intrude upon it. The use of stone and timber indigenous to the site must be encouraged and in amenity tree planting, the indigenous species are to be preferred. Stringent fire control and anti-litter measures must be enforced and a regular maintenance programme for all facilities is essential.

The following spots will become accessible for day visits with the completion of the limited development programme: Banksia Camp, Clifly Head, Fish Creek, Lake Maringup, Coodamurup Beach, the mouth of the Gardner River, Doggerup Beach, Malimup Springs, Warren Beach, Lake Jasper and Jasper Beach.

A suggested timetable for development of access into these places is outlined later in the report.

A further aspect of the development in Zone 2 must be mentioned. It is reasonable to forecast that at some time in the future, the camping and holiday facilities in Zone 1, already described, will become overtaxed. When this happens it may be necessary to reclassify one or more Zone 2 sites as Zone 1. Although further townsites are not envisaged at this stage, the provision of further camping areas or perhaps caravan parks will probably have to be considered.

### 3.2.3 ZONE 3: WILDERNESS AREAS

The provision of wilderness areas is a concept of major importance in this plan. They are proposed for two reasons: one may be termed "environmental protection" and the other the "wilderness experience".

Environmental protection: 13% of the proposed reserve comprises unconsolidated sand dunes and a further 46% is "recently" consolidated dunes now supporting a relatively unstable woodland and scrub vegetation. Excessive vehicular traffic (particularly by four-wheel drive vehicles and beach buggies), overgrazing or uncontrolled use of fire in these areas will accelerate the movement of the open sand masses and lead to heavy erosion of the anchored dunes. Some form of protection of at least parts of this land form is essential.

The wilderness experience: As the population of Western Australia grows and continues its current trend towards concentration in the cities, there will be an increasing demand for places where beautiful coastal scenery and adjacent bushlands can be enjoyed in their natural state. In such areas the more hardy recreationist can seek solitude and adventure and come to terms with himself and his environment, and the naturalist can study indigenous plants and animals in their natural situation.

The philosophy underlying the wilderness concept is a difficult one to describe. Traditionally, Australians have looked to the construction of access roads as being basic to any development in a virgin area, be this agricultural or recreational or any other form of land development. Yet the pioneering days, at least in the south west of the State, are now over, and increasingly it can be expected that urban and industrialised populations will seek places where the spirit and the simple life of the pioneer can be recaptured. Not everyone will want such areas, but those that do must be considered. Part of the basic appeal of the coastal strip as it is today is its freedom from the sort of high density urbanised recreation which dominates the west coastal "tourist resorts" south of Perth. The conservation of natural areas for low density, extensive recreation and for scientific and educational reference can only be achieved through the dedication of such areas as wilderness.

Coastal wilderness areas such as those proposed in this report are a rare (if not already non-existent) resource in the south west land division.

Three wilderness areas are proposed. They are:

- i) Yeagarup: This is an area of some 33,000 acres roughly bounded by the Warren and Donnelly Rivers. The bulk of the area is covered by the Yeagarup Dunes, an unbroken sand mass seven square miles in area and up to 300' high.
- ii) The Broke Area: Roughly bounded by the southern banks of Broke Inlet and the Southern Ocean, this occupies an area of approximately 25,000 acres. Along the coastline in this area are some of the most superb cliffs and headlands in the entire reserve. The mouth of the inlet cuts these cliffs and is a place of incredibly rugged beauty.
- iii) Nornalup National Park (western section): West of the and adjoining the Nornalup Inlet, and including a number of offshore islands, this proposed wilderness area occupies some 15,000 acres. The coastline in this area is again a wonderful sample of rugged coastal beauty.

It is important to emphasise that it is not the intention of this plan to keep people out of the wilderness areas. The basis of the concept is to provide places where people can walk, ride horses or journey to by boat, and where they can find release from the pressures of civilised life.

### 3.3 ROAD NEEDS AND SPECIFICATIONS

Carefully planned roading is the key to the development zones outlined in the previous section.

The road system which most adequately copes with the requirements of the zonation is shown on Plan 3 in Appendix II. The critical elements of this system are a single major road outside and parallel

to the inland boundary of the proposed reserve, and a series of access roads, built to certain defined specifications, coming at right angles from the major road and crossing the reserve directly in to the proposed developments on the coast. This system will permit maximum access but make a minimum impact on the reserve itself.

Recommended classification and specifications for roads in the proposed reserve are outlined below.

### 3.3.1. ROAD CLASSIFICATION

Roads in the area will fall into three categories. These are termed Arterial, Sub-arterial roads and Tracks.

- i) Arterial Roads ("A" Class): These will be sealed roads built to specification designed by the Main Roads Department.
- ii) Sub-arterial Roads ("B" Class): These roads may be sealed or will be gravelled to ensure all-year traffic, also built to specifications laid down by Main Roads Department.
- iii) Tracks ("C" Class): These need not be all-weather roads and their construction will not be governed by specification. They will represent "occasional access" tracks, if necessary closed to the public, and mainly for use in fire control work.

### 3.3.2 ROAD LOCATION

Class A roads will be constructed into the proposed fully developed areas at Windy Harbour, Broke Inlet and Black Point. The major road paralleling the inland boundary of the reserve will also be an A class road.

B and C class roads will be constructed across the limited development areas.

No roads will be constructed in the proposed wilderness areas, and existing roads and tracks in these areas will be closed.

### 3.4 DEVELOPMENT TIMETABLE

Two factors will govern the rate of development of recreation facilities and access roads in the proposed reserve: the first is the availability of finance to carry out the work, and the second is the capacity of the area to cope with the public demand. Neither of these factors are easy to predict, but knowledge about them will become apparent as time goes by. It is therefore not possible to write a rigid development programme at this stage; what is possible, however, is to suggest priorities for development.

These priorities are:

1. Declaration of the wilderness areas and the closing of vehicular access within them.
2. Development of the settlement plans for Windy Harbour, Broke Inlet and Black Point and the restriction of expansion of the existing settlement at the mouth of the Donnelly River.
3. Selection and survey of the A class road into Black Point and of the B class roads into the limited development areas. Construction of the Black Point road should then follow.
4. Construction of Zone 2 roads in the following order:
  1. Banksia Camp Road.
  2. Warren Beach Road.
  3. Donnelly Boat Landing Road.
  4. Fish Creek Road.Roads into other Zone 2 areas (e.g. Gardner River mouth, Coodamurrup, Lake Jasper, Malimup etc.) should proceed when finance becomes available.

Development of picnic facilities, etc. at the ends of the above roads should take place concurrently.

It will be a key function of the body administering the proposed reserve to see that finance is obtained in such a manner to allow the development of facilities to precede the demand for them. But development should never be permitted to outstrip the demand or the capacity for maintenance of facilities established.

### 3.5 RECOMMENDED TENURE CHANGES

As already described in section 2.3, the major tenures within the proposed reserve are State Forest (approximately 1%), National Park (6%), vacant crown land (62%), miscellaneous crown reserves (26%) and private property (4%). Of the vacant crown land, roughly one-fifth is held under lease for pastoral purposes and a further very small area has been approved for alienation as private property.

If the area is to be adequately preserved and if the development programme outlined above is to be carried out, it is clear that changes to existing tenures will be necessary. Security of tenure is a keynote to the entire project.

Problems of administration and development would be greatly simplified if the whole of the proposed reserve was of the same tenure. It is recommended that this should be a National Park or similar "A" Class reservation. There are obvious difficulties with this proposition, particularly in the cases of vacant crown lands held as grazing leases and private property.

The presence of grazing leases is basically inimical to the purposes and objectives of the proposed reserve. Cattle compete with indigenous fauna for food, they can cause erosion of the sandy soils and they foul the beaches. An apparently essential tool of management of the grazier is the frequent, hot summer fire; these

cause considerable damage to the forests and woodlands within the area. The presence of cattle requires the presence of fences, stockyards and access tracks for the cattlemen. However, it is apparent that these leases are of economic benefit to the lessees. Clearly it would be bad politics to announce their immediate revocation. It is therefore recommended that the lessees be informed of the ultimate plans for the area; those whose leases are renewed annually should be given notice of revocation after a stipulated time, say five years and the remainder informed that the leases will not be renewed when their current term expires.

It is important to appreciate some of the rights of the holders of Pastoral Leases. They may clear the bush and establish pasture; they are at liberty to prohibit public entry onto lease areas; they can construct fences across the beaches to the high water mark; they set fire to the bush virtually without restriction (this is mainly due to the almost complete inability of local authorities to police their activities). The nett result can be serious disfigurement and disruption of the natural bush environment. It is therefore suggested that for those leases within the proposed reserve, consideration be given to the amendment of certain provisions of the Lease Document. In particular restrictions should be imposed on such agricultural pursuits as clearing and pasture establishment and the prohibition of public access through lease areas should not be permitted.

The privately owned lands within the proposed reserve are a more difficult problem. It is recommended that a policy of Government resumption and repurchase be adopted. There are precedents for this in the cases of resumption and repurchase of private holdings in water catchments for example in the Helena Catchment east of Mundaring Weir. It is recommended that a list of the private blocks in the proposed reserve be drawn up and a priority decided upon for transfer of these blocks to the crown. Obviously this project will be dependent upon availability of finance and the importance which the Government attaches to it.



### 3.6 THE FIRE CONTROL PROBLEM

An area of over a quarter of a million acres of bushlands in the south-west of Western Australia clearly poses a massive problem of fire control. There are two inescapable facts:

- i) each summer weather conditions will occur in which fires can run in the area, and
- ii) fires will be started, either by natural or human agencies.

Fire has always been a natural part of the environment of this area. Plant and animal life has evolved in a fire climate and most of them have unique adaptations which enable them to survive frequent, mild fires. The development of some species are inhibited by the prolonged exclusion of fire from the environment.

The most satisfactory solution to the fire problem would appear to be a policy of regular prescribed burning carried out under controlled conditions and implemented by experienced personnel. Special prescriptions may be required for the optimum protection of specific flora and fauna communities within the area (e.g. the peppermint woodlands). Research will be necessary to develop appropriate prescriptions and techniques for the use of fire in such areas. The controlled burning programme must be supplemented by stringent application of the conditions of the Bush Fires Act and by the maintenance of a fire fighting team capable of suppressing uncontrolled fires in the bush and in the settlements.

#### 4. ADMINISTRATION

The foregoing proposals for the dedication of a large reserve and its detailed development are meaningless unless a suitable body can be formed with the authority and the means to administer the area.

A suitable authority for this job must have the following characteristics:

- i) Vested authority to plan and to act.
- ii) An understanding and sympathy with the interests to be served by the area and its plan.
- iii) Technical know-how.
- iv) A positive outlook and the ability to bring to fruition the objectives of the plan.
- v) A clear appreciation of the limitations of their knowledge and the will and ability to foster study and research.
- vi) A regular source of adequate funds, and the staff and plant to carry out annual works programmes.
- vii) Administrative experience and the ability to engender public confidence in their plans and achievements.

It is recommended that when the Government reaches a decision to implement the plans put forward in this report, that they seek or form an organisation who meet the above requirements and charge them with the responsibility for the establishment and development of the area.

## 5 APPENDICES

### APPENDIX I

#### NOTES ON MAJOR PHYSIOGRAPHIC FEATURES

##### 1. GEOLOGICAL FEATURES

Perhaps the most noteworthy geological feature is the outcrop of columnar basalt at Black Point (Cape Beaufort) which is a superior example to the only other occurrence in Western Australia at Bunbury.

Coastal limestones occur along the full length of the coastline. In places (Windy Harbour, Cape Beaufort, Clifly Head, Fish Creek) these have been eroded into towering sea cliffs. In other places they have been covered by dunes and have a substantial width of beach between them and the sea (between the Warren and Meerup Rivers).

From Windy Harbour eastwards the underlying pre Cambrian Granites and Gneisses can be seen outcropping below the coastal limestones. Point Nuyts and Long Point have lost their limestone caps and form massive gneissic headlands which drop steeply into deep water.

Inland, gneissic monadnocks occur near Windy Harbour in Mt. Chudalup and Little Chudalup. Similar outcrops occur near Walpole at Mt. Hopkins, Mt. Clare and the Woolbale Rocks.

About midway, a change in the underlying geology occurs. Eastwards, the predominant underlying rock is pre cambrian granite and gneiss: to the west are sediments probably of Permian origin. In the latter coal has been found in the Fly Brook area, which adjoins the area under consideration. Early in the century a number of unsuccessful holes were drilled for oil near the mouth of the Warren River. From the number of claims pegged in recent years, it would appear that mineral sands (ilmenite, monazite etc)

occur in some quantity over a considerable distance.

## 2. RIVER SYSTEMS

Five river systems (Donnelly, Warren, Gardner, Shannon and Deep) enter the sea within the length of coastline in question. Other minor rivers rising comparatively close to the coastline are the Meerup River and Doggerup Creek. Numerous smaller streams and springs are found within the coastal limestone, the most notable of which is the Malimup Spring.

All the above rivers have permanent flows at their mouths, with strong peak flows during the winter months.

The Deep and Shannon Rivers discharge into inlets (Nornalup and Broke Inlets respectively) before entering the sea. Sand bars form across the mouths of all inlets and rivers, but in the cases of the Warren River, Meerup River and the Nornalup Inlet the bars are kept permanently open by channels formed by the action of either stream flow or tidal action. In other cases during the summer the bars can remain closed for long periods. Barring of the mouth of the Donnelly in particular causes the backing up of water near the mouth to form a broadwater. The inlets and broadwaters provide wide stretches of sheltered water rich in edible fish and well suited to varied recreational pursuits.

Once the tidal influence is lost at varying distances from the mouths, all rivers mentioned contain the fresh water lobster, marron. The Donnelly and Warren Rivers contain the introduced fish, trout, and red fin perch has been introduced into the Warren.

## 3. FLATS, SWAMPS AND LAKES

Most swamps and lakes occur immediately inland from the coastal dunes and appear to be the result of sand dunes blocking older drainage lines, thus causing a back-up and re-direction of drainage. Some are quite

large in extent e.g. Naenup swamp, Lake Maringup and Lake Jasper.

Lake Maringup is unique in that it contains numerous large tree stumps, the tops of which are readily visible at or just below water level. It is fairly certain from their size that these are karri trees - the logs, some 90' or more in length, can be seen underwater leading from stumps, many of which are about 12' from the lake floor, and up to 6' in diameter at that height. Evidence suggests that this lake is of relative recent origin and was caused by a sudden change in the drainage pattern, caused perhaps by moving sand dunes some distance away. An area of karri forest was drowned and accelerated rot at the air-water interface eventually severed the trees at that level.

Crystal Lake is situated in the National Park on the eastern side of the area between Mt. Hopkins and the Deep River and has been formed by the blocking of a stream by a sand dune in past times. The formation of the lakes by this method is common, but the interesting point in respect of Crystal Lake is that the discharge from the lake is underground at least 100 - 200 yards away into a small stream that is at the bottom of a steep sided chasm 50 - 100 feet below the lake and general ground level.

Between Yeagerup dune and the Donnelly River there exists a largely unexplored area of numerous swamps and lakes among consolidated dunes. These and the better known Lake Jasper, Naenup Swamp and Lake Maringup all contain numerous waterfowl. Some lakes (Yeagerup, Jasper) are well known for the marron they yield.

Flats differ from the swamps in that they are found further inland and do not remain flooded for the whole year. Similar formations near Torbay have been named "Plantagenet Peaty Sands" by Burvill. They are acid in reaction, contain black peat, and generally have a "coffee rock" layer at varying depth. They remain flooded in the winter months, but dry out in summer. The presence of seashells suggest that these are a previously drowned coastline which has since been slightly uplifted.

The flats are remarkable for the richness of their flora, with many members of the family Restionaceae represented.

Bottlebrushes (Callistemon, Beaufortia) create a blaze of colour in season. The pitcher plant (Cephalotus follicularis) is widespread though well hidden.

#### 4. OFFSHORE ISLANDS

The following offshore islands occur:

Chatham Island - This spectacular gneissic crag rising steeply out of the sea off Cliffy Head was named after one of the ships in Captain Vancouver's expedition of 1791. This was its first Australian landfall, and was the first West Australian land formally taken possession of in the name of the King of England.

Flat Island and Sandy Island - Two small islands offshore from Cape d'Entrecasteaux (named after Admiral d'Entrecasteaux whose expedition made this its first landfall in 1792). Sandy Island is a fauna and flora reserve.

Saddle Island and Goose Island - Two islands offshore from the mouth of the Nornalup Inlet.

Other small reefs occur, including two known as the Cow and Calf which can be seen well out to sea from headlands only on fine clear days.

#### 5. INLETS

The only inlet completely within the area is Broke Inlet, named by Captain Vancouver. The eastern boundary of the area under consideration is the Nornalup Inlet.

Broke Inlet, in common with many inlets, is a rather shallow expanse of water into which the Shannon

River and some smaller streams discharge. It has a river-like outlet of approximately two miles in length between the inlet and the sea. Like many other south coast inlets it has a sand bar and discharges water into the sea directly only during the winter months.

These conditions are ideal for the development of some fish species. The inlet was once legendary among local fishermen for the size and number of King George Whiting to be caught there, before it was opened to professional fishing in the early 1960's.

The mouth of the Nornalup Inlet is continuously open. Although there are some shallow sand banks this Inlet has large stretches of reasonably deep water and had full facilities for water sports, including yatching.

## 6. VEGETATION TYPES

The vegetation forms within the proposed reserve are extremely diverse considering the consistent nature of the rainfall pattern over the area. In this climatically restricted zone, it is interesting to find such contrasting forms as the loose, mobile sand dunes carrying no vegetation at all (e.g. the Yeagarup Dunes) and dense karri-tingle forest at the eastern end of the area north of Mt. Hopkins. A wide range of vegetation types are represented, for example forests, savannah woodlands, savannah grasslands, heath and scrub types and the wet flats and swamp types. A brief description of the more common types are as follows:

- i) The jarrah-marri forests: These are generally poorer than the better forests further inland. Although odd patches may have trees up to 100' in height the majority is about 60' high.

The main understorey species vary from place to place but black-boys, peppermints and banksias are fairly common and widespread. In some areas Zamia palms are numerous. Jarrah-marri forests generally occur on the oldest consolidated dunes furthest from the coast. They generally grade down to open savannah woodland towards the coast and into better quality forest inland. The soil appears to be only sand but "coffee rock" maybe

present below the surface.

- ii) The karri forests: These are not extensive but occur as scattered patches along the entire length of the area from the Walpole Inlet to Black Point. The two main types occurring are the almost pure karri islands with some marri and occasionally yate; and the karri-tingle forests. The karri are generally rather stunted but still well over 120' in height, except for very exposed patches close to the coast.

There is a mixed karri-tingle stand in the Nornalup National Park just south of the Deep River. It is believed that both red and yellow tingle occur in mixture with the karri in this area.

Karri types are generally found associated with soil derived from Gneissic granites. This is most apparent in the Mt. Chudalup area. Recent work has revealed that some karri may also occur on limestone soils especially where yate is found growing in mixture or adjacent to the karri.

The understorey is very thick and tall, growing to over 30 feet in height when not regularly burnt. The main understorey species in the forest is karri wattle (Acacia pentadennia).

- iii) The bullich-yate forest occurs as small scattered patches grading in places into a savannah woodland but on favoured sites it forms a closed canopy forest. Stands are only 60' to 80' high and the trees reasonably small, 1' to 2' in diameter. They usually occur on sandy soils in a sheltered position and possibly with better water relations than the majority of the consolidated dunes. The understorey varies with the size of the patches but in the more favourable areas Hibbertia montana is common and with it the common wildflowers and creepers of the peppermint savannah woodland.

- iv) Savannah woodlands cover extensive areas of the consolidated dunes from close to the coast right back to the forest edge. The main tree species is peppermint (Agonis flexuosa). This is a most attractive vegetation type as the areas between



the trees are commonly open and park-like in character. In addition, the peppermints are excellent shade trees and these areas display a beautiful ground flora during the wildflower season. Among the more attractive of the wildflowers in this type are the white spider orchids, everlastings, Hibbertias and the creepers Clematis and Hardenbergia.

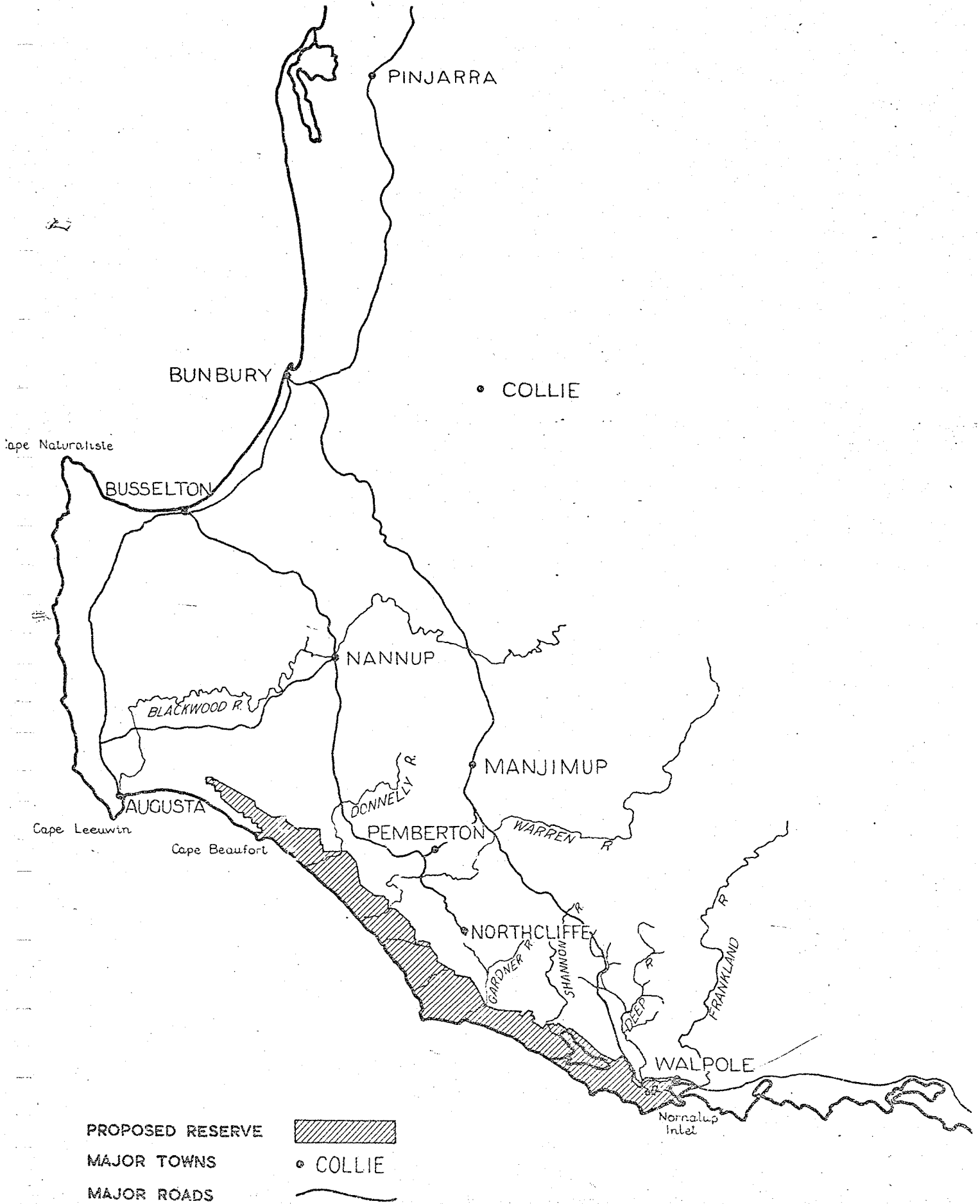
There are small areas, mainly in the private property south of the Deeside where true savannah grasslands occur. The trees are very scattered and are mainly peppermints. This is a rare vegetation type in the higher rainfall areas of the south-west of Western Australia.

- v) Heath: There are large areas of heath vegetation or low scrub. These are of two main types and occur both closely behind the beach dunes and further inland. One type is composed of dense impenetrable thickets mainly of Acacia species and generally with low scrub and the mallee form of peppermint. These thickets are up to six feet high and are mainly close to the actual beach fronts. At certain times during the spring when the Acacias are in flower the hillsides covered in this scrub present a green and yellow patchwork when viewed from a distance. There is another distinct heath type with the height and density of scrub very much reduced. The scrub is only one to two feet high and this is characterised by having odd scattered Banksia grandis throughout and the pink Pimelia is a common shrub.
- vi) Wet flats and swamp types: These occur scattered throughout the entire area. Although grouped as one type, the flats and swamps are very varied. Some are quite open with water lying between Swamp Banksias and with low ground flora. Others are covered with extremely dense ti-tree and bottlebrushes. On the more peaty swamps the insectivorous plant Cephalotus follicularis grows, generally associated with the ti-trees.

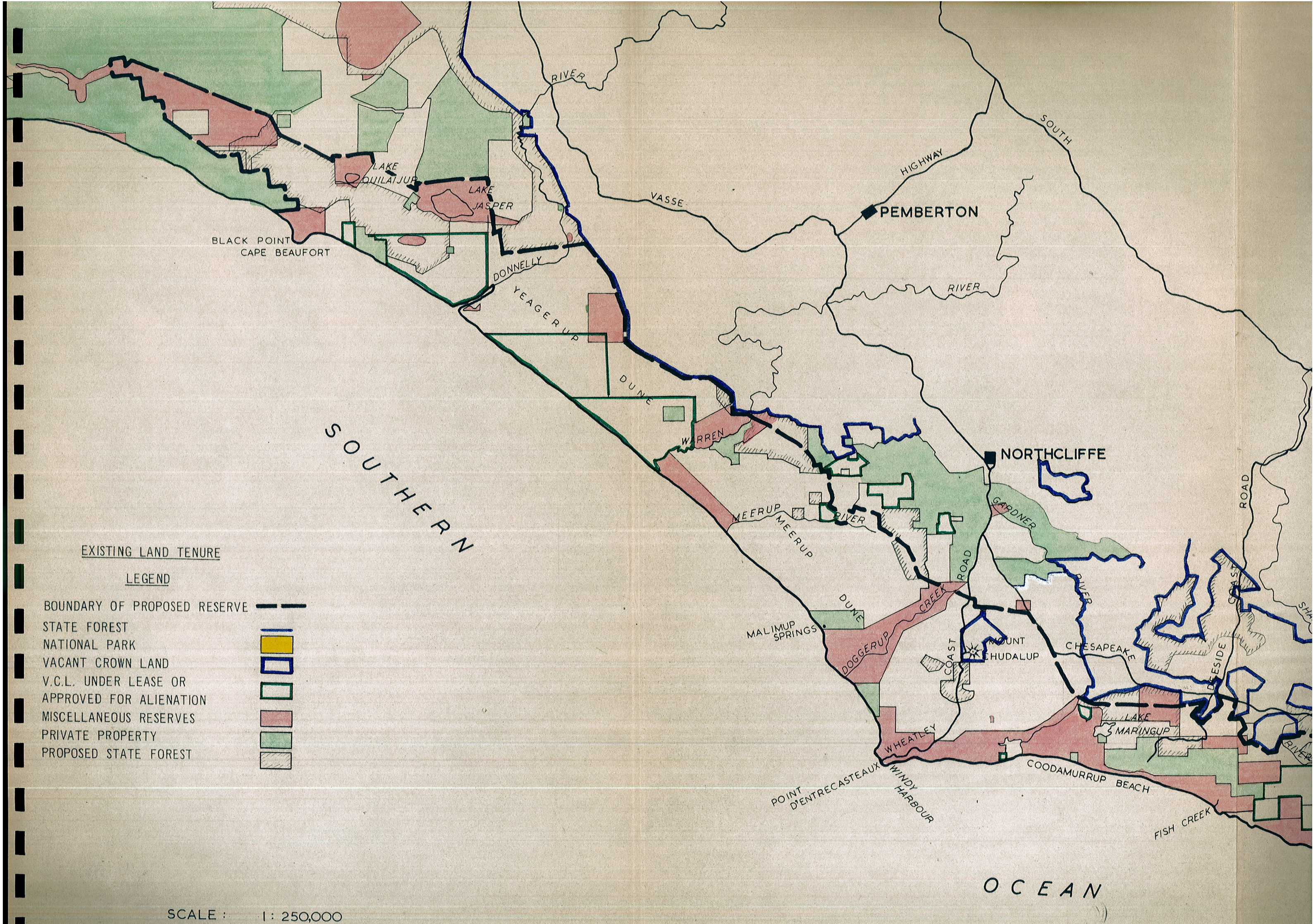
FIGURE I.

APPROXIMATE POSITION OF PROPOSED RESERVE

SCALE: 20 MILES TO AN INCH.















EXISTING LAND TENURE

LEGEND

- BOUNDARY OF PROPOSED RESERVE 
- STATE FOREST 
- NATIONAL PARK 
- VACANT CROWN LAND 
- V.C.L. UNDER LEASE OR APPROVED FOR ALIENATION 
- MISCELLANEOUS RESERVES 
- PRIVATE PROPERTY 
- PROPOSED STATE FOREST 

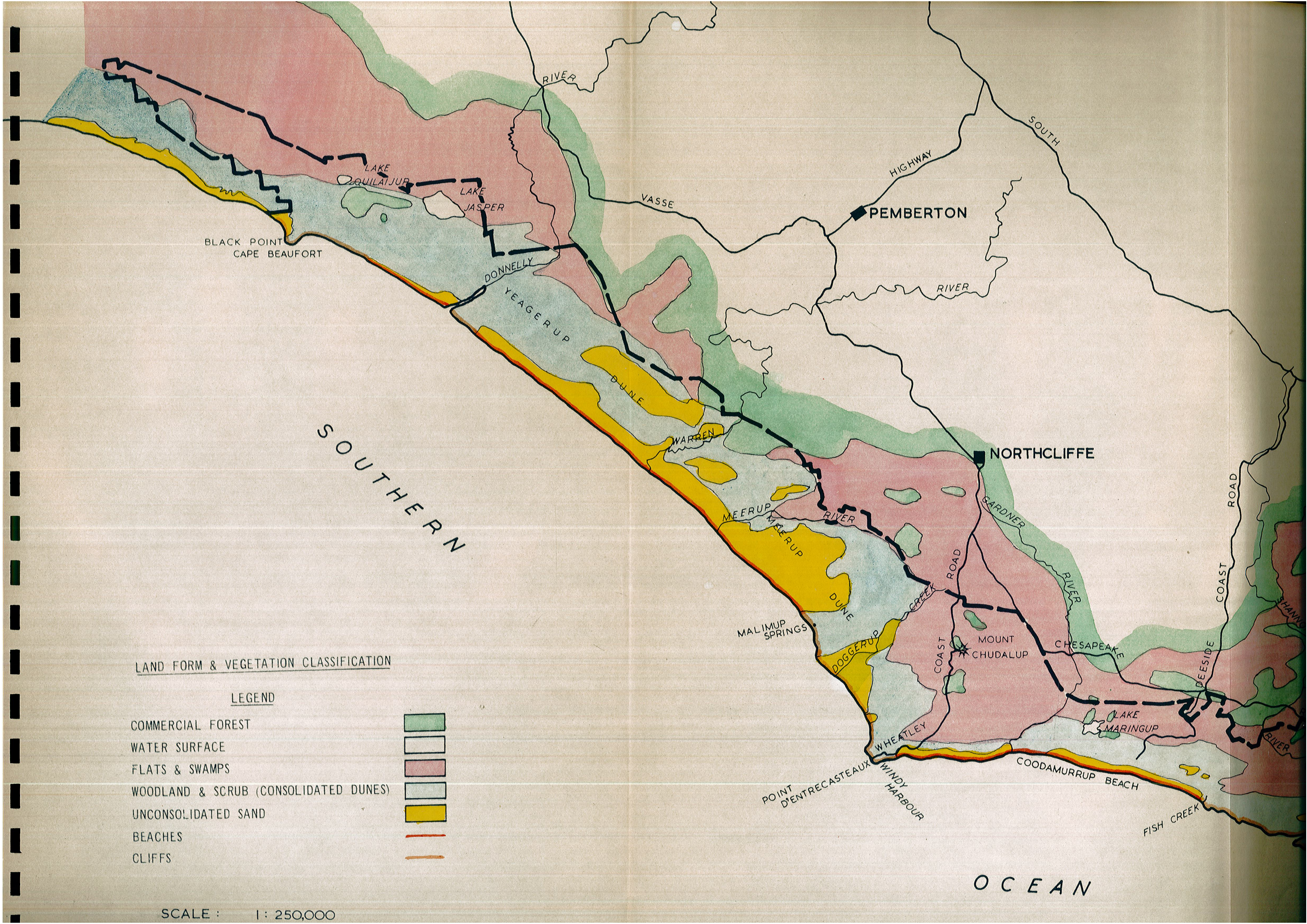
SCALE : 1 : 250,000

OCEAN









S O U T H E R N

LAND FORM & VEGETATION CLASSIFICATION

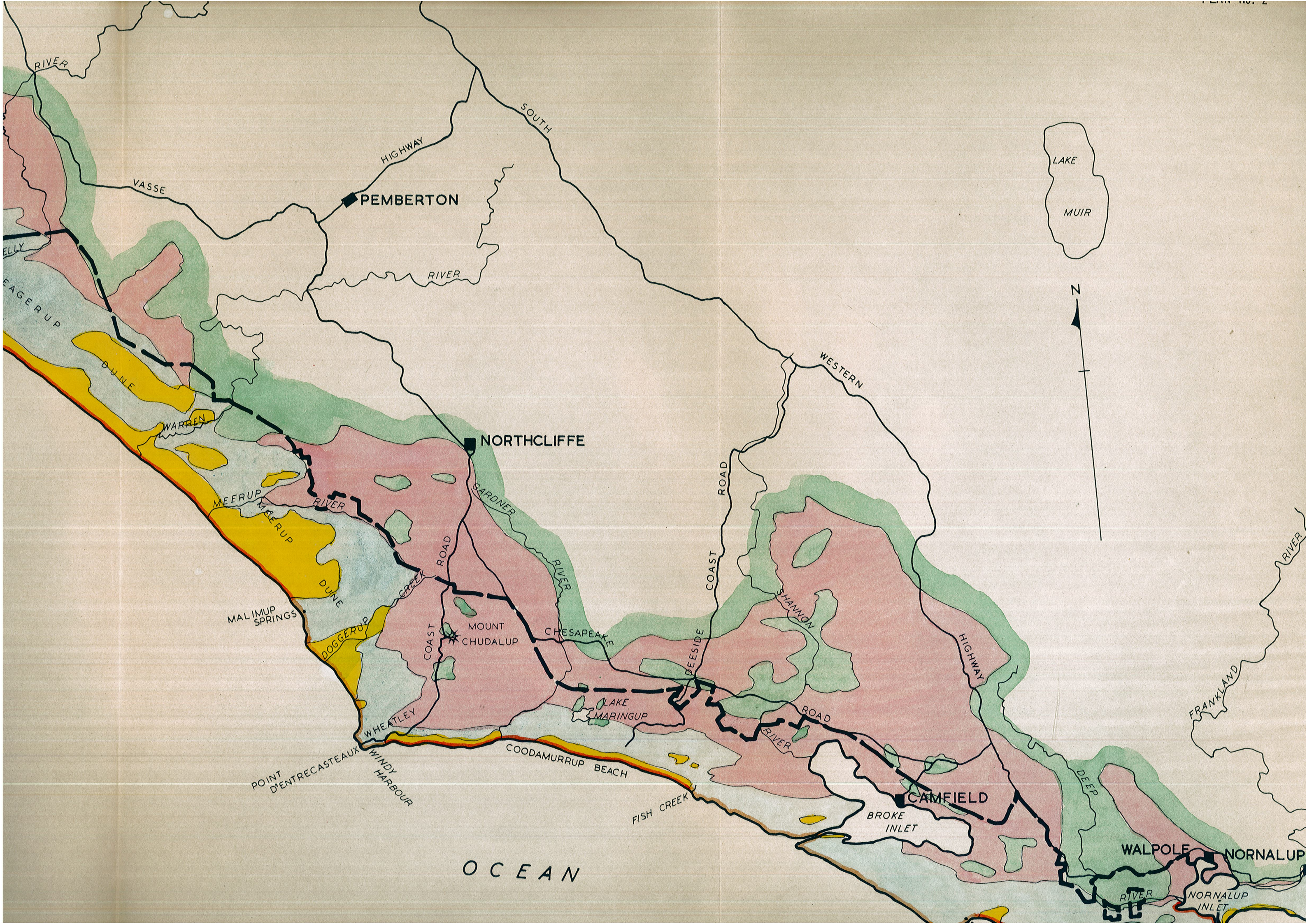
LEGEND

- COMMERCIAL FOREST
- WATER SURFACE
- FLATS & SWAMPS
- WOODLAND & SCRUB (CONSOLIDATED DUNES)
- UNCONSOLIDATED SAND
- BEACHES
- CLIFFS

SCALE : 1 : 250,000

O C E A N





RIVER

PEMBERTON

RIVER

NORTHCLIFFE

MOUNT CHUDALUP

CAMFIELD

WALPOLE

NORNALUP

OCEAN

LAKE

MUIR

N

VASSE

HIGHWAY

SOUTH

WESTERN

MEERUP RIVER

WARREN

MALIMUP SPRINGS

COAST ROAD

CHESAPEAKE

DEESIDE COAST ROAD

HIGHWAY

POINT D'ENTRECASTEAUX

WINDY HARBOUR

COODAMURRUP BEACH

FISH CREEK

LAKE MARINGUP

ROAD

BROKE INLET

DEEP

FRANKLAND RIVER

RIVER

NORNALUP INLET





DEVELOPMENT ZONES & PROPOSED ROADING

LEGEND

- FULLY DEVELOPED
- LIMITED DEVELOPMENT
- WILDERNESS
- A CLASS ROADS
- B CLASS ROADS

SCALE : 1 : 250,000.  
3.94 MILES TO AN INCH



