SHIRE OF JERRAMUNGUP

POINT HENRY LIMITED RURAL STRATEGY

(AS ADOPTED BY THE STATUTORY PROCEDURES
COMMITTEE OF THE DEPARTMENT OF
PLANNING AND URBAN DEVELOPMENT
AND COUNCIL)

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June 1991

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SUMMARY

The recently gazetted Town Planning Scheme for the Shire of Jerramungup suggested that the area south of Bremer Bay townsite be considered for Special Rural development.

Bearing in mind the strong demand for land near the coast, and the location of the Shire, it was considered that the Point Henry Peninsula is the only area in the Shire with potential for Special Rural development.

Accordingly, in order to satisfy rural planning guidelines and methodology established by the Department of Planning and Urban Development, this Limited Rural Strategy has been prepared to define areas on the peninsula suitable for Special Rural land use, and to give direction to Council and developers on the creation of appropriate zones.

This Strategy addresses a Study Brief which was approved by the Jerramungup Shire Council and the Department of Planning and Urban Development.

The preparation of the Limited Rural Strategy was commissioned by the major landowner on the peninsula, and some of the owners of land on the eastern side of the peninsula have also contributed to the cost of its preparation.

The peninsula is currently undergoing significant change, since roads are being constructed to facilitate public access to the five beaches and scenic coastline.

The Strategy report concludes that rural residential development at differing densities (depending on the environmental capability of the different parts of the peninsula) can occur in a complementary fashion with the current changes, and is suitable on most of the interior of the peninsula, subject to compliance with strict environmental and visual protection criteria and controls, particularly aimed at ensuring that building envelopes and new roads are properly located, and that a fire management plan to the satisfaction of the relevant authorities, is implemented.

METHODOLOGY

In order to arrive at a planning strategy for the peninsula, the following aspects were investigated and analysed in some detail:

- Socio-economic characteristics - population and growth, cultural heritage, existing land use and ownership, and the implications of rural residential subdivision.
- The demand for rural retreats.
- Current planning proposals.
- Physical characteristics - physiography, slope, vegetation, geology, soils, erosion, water resources, climate, fire hazard.

- Services - roads, water supply, effluent disposal, drainage, SECWA and Telecom services and community services.
- The capability of land units to support rural residential development (the Land Capability Assessment methodology derived by the Department of Agriculture in conjunction with the Department of Planning was employed).
- Landscape assessment - scenic quality and visually significant areas were studied, in order to define landscape management zones and policies for these.

The authorities and individuals listed in Appendix 2 were contacted during the preparation of the Strategy.

PLANNING PRECINCTS AND DEVELOPMENT GUIDELINES

A synthesis of all the material gathered in the evaluation stages resulted in three planning precincts being identified.

These precincts comprise the Recreation and Environment Protection precinct, in which, it is proposed, no rural residential development will be permitted; the Rural Residential precinct, where "Special Rural" type zoning and subdivision may occur at differing lot densities depending on environmental capability; and a Restricted Rural precinct. In the Restricted Rural precinct, the onus is on the proponent/owner to establish to the satisfaction of the relevant government authorities that subdivision and house development would not cause detrimental impact, in terms of land capability and visual intrusion, before Rural Residential type rezoning can be considered.

The application of stringent landscape and environmental controls in each precinct is considered of prime importance, having regard for the objectives to provide opportunities for rural residential living in a scenically attractive environment, and to increase recreational use of the coastline.

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1.1 Background

The recently gazetted Town Planning Scheme for the Shire of Jerramungup suggested that the area south of Bremer Bay townsite be considered for Special Rural development. Bearing in mind the strong demand for land near the coast, and the location of the Shire, it is considered that the Point Henry Peninsula is the only area in the Shire with potential for Special Rural development.

Accordingly, in order to satisfy rural planning guidelines and methodology established by the Department of Planning and Urban Development, this Limited Rural Strategy has been prepared to assess in more detail the potential of the peninsula for such development.

This Strategy addresses a Study Brief which was approved by the Jerramungup Shire Council and the Department of Planning and Urban Development. A copy of the brief is attached as Appendix 1. Authorities and individuals contacted during the course of preparation of the Strategy are listed in Appendix 2.

The preparation of the Limited Rural Strategy was commissioned by the major landowner on the peninsula, and some of the owners of land on the eastern side of the peninsula have also contributed to the cost of its preparation.

The peninsula is currently undergoing significant change, since roads are being constructed to facilitate public access to the five beaches and scenic coastline. The report concludes that rural residential development at differing densities (depending on the environmental capability of the different parts of the peninsula) can occur in a complementary fashion with these changes, and is suitable on most of the interior of the peninsula, subject to compliance with strict environmental and visual protection criteria and controls, particularly aimed at ensuring that building envelopes and new roads are properly located, and that a fire management plan to the satisfaction of the relevant authorities, is implemented.

1.2 Objectives of the Limited Rural Strategy

The Limited Rural Strategy brief requires that the following objective is fulfilled:

> "To have in place a limited strategy for the creation of a special rural zone within the Shire of Jerramungup that will:
>
> A. Define areas within the area from the southern boundary of the Bremer Bay townsite to the B Class reserve 3766 of the south point of Point Henry which are considered suitable for special rural land use.
>
> B. Give direction and guidance to Council and developers with regard to the creation of the special rural zone.

C. To ensure that the areas selected are located within a landform which is not in a natural hazard area with constraints to development such as steep slopes, blowouts, wind exposure and fire hazards and capable of sustaining a more intense form of land use activity without detriment to important landscape features both visual and the general landscape amenity, availability of prime agricultural land, the management cost of adjoining landowners and the adjoining reserved land; and

D. Satisfy consumer demand for the next 2-3 years after the finalisation of the limited strategy."

This Strategy, which has been undertaken in accordance with guidelines issued by the Department of Planning and Urban Development for the preparation of Local Rural Strategies, addresses the following:

- socio-economic and demand analysis;
- physical characteristics of the area;
- land capability assessment;
- landscape assessment;
- services;
- selection of policy areas;
- management proposals and planning criteria for policy areas.

1.3 Location

The area under investigation, the Point Henry Peninsula, lies due south of the town of Bremer Bay.

As Figure 1 shows, Bremer Bay, which is located on the coast between Albany and Esperance, is 511 km from Perth (a five and a half to six hour drive), and 181 km from Albany (a one and three quarter hour drive).

The study area, as approved by the Department of Planning and Urban Development and Council, is identified in Figure 2.

The northern boundary of the study area is 3.5km south of Bremer Bay, and adjoins the southern boundary of the town site.

1.4 Area

The study area comprises approximately 2000 ha. Of this, about 1560 ha. is in private ownership, and 440 ha., around the coastal fringe, is reserved land.

POINT HENRY LOCATION MAP

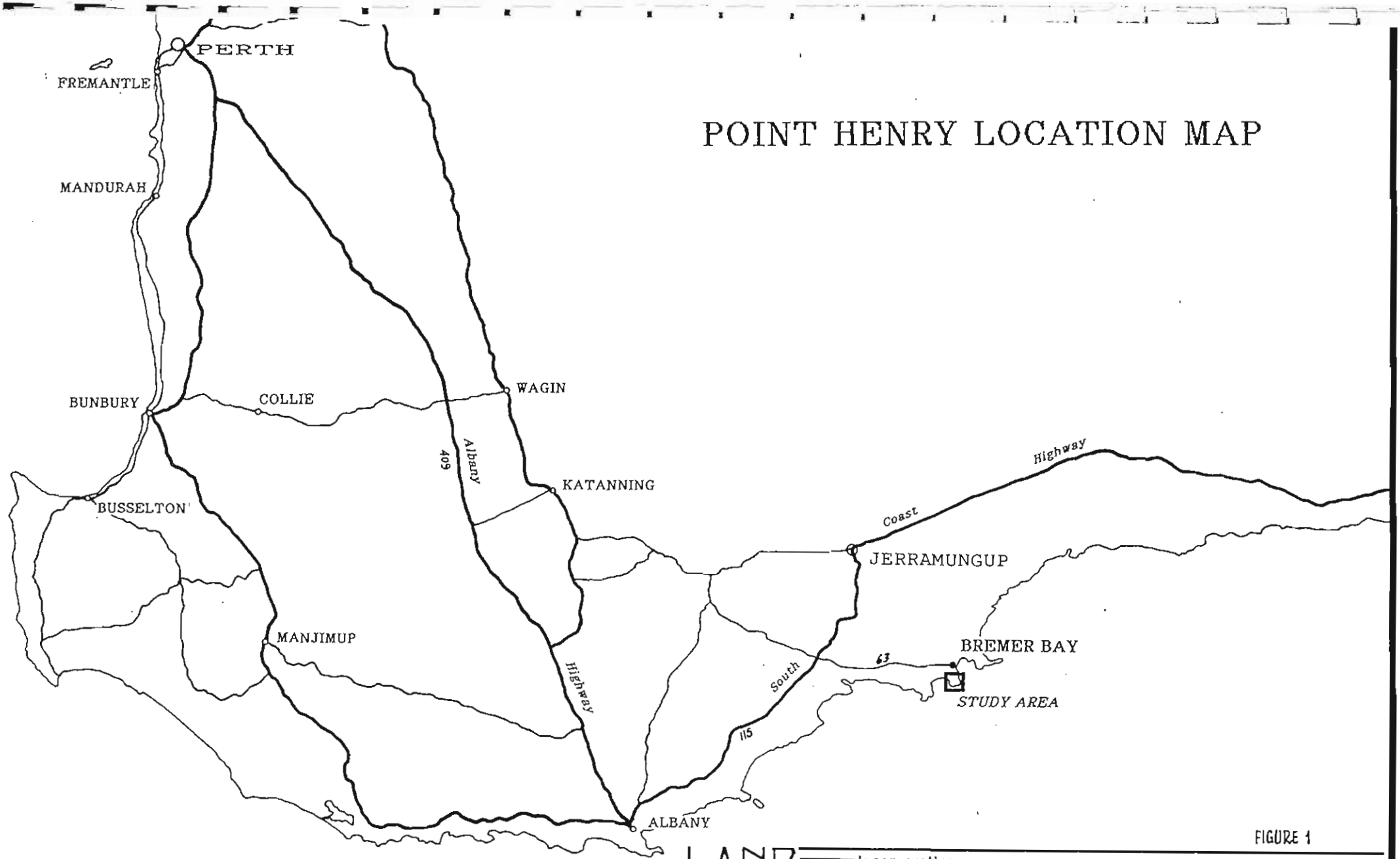

FIGURE 1

LANDPLANNING CONSULTANTS
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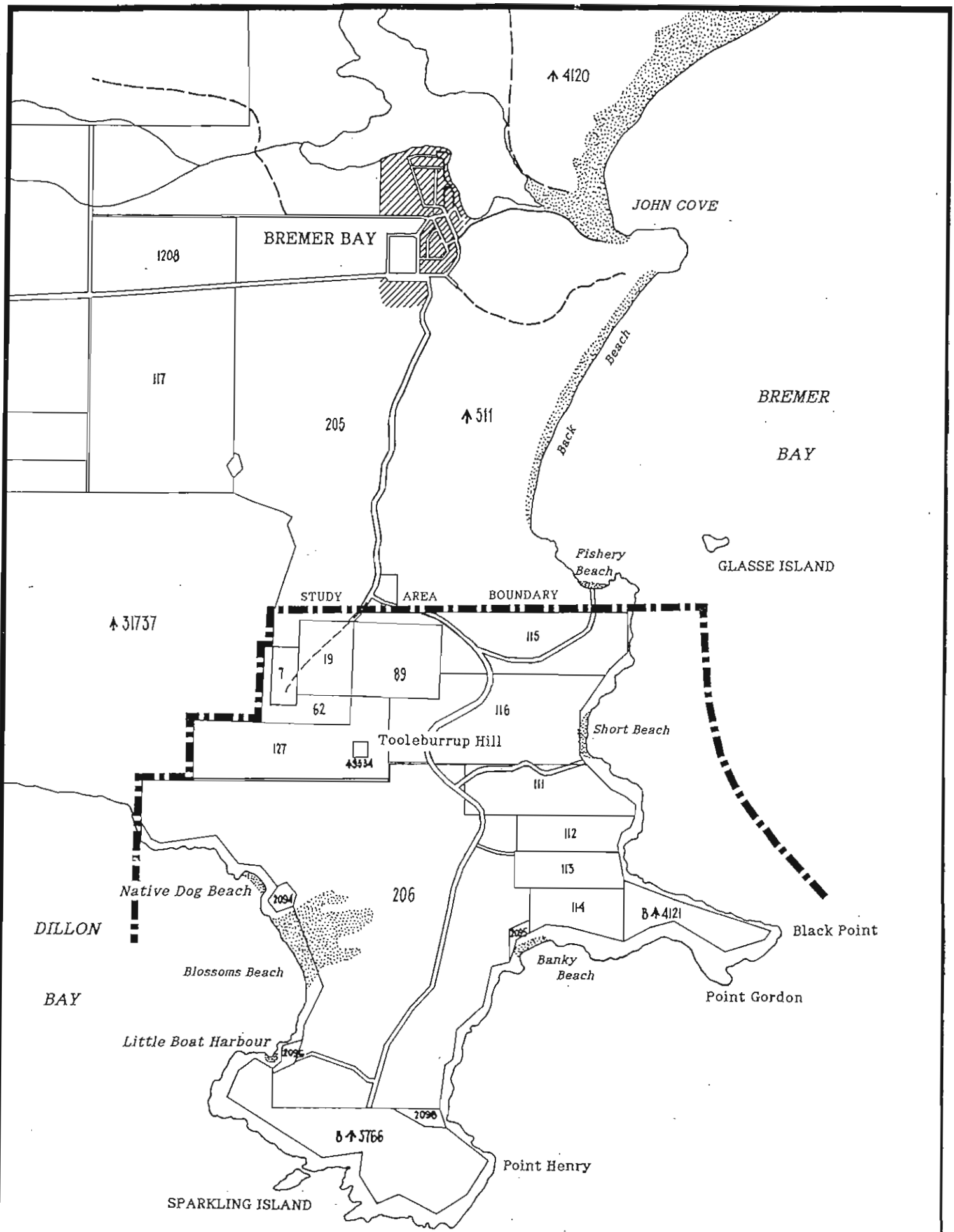
NOTE: All Areas and Dimensions are subject to survey.



POINT HENRY – LIMITED RURAL STRATEGY AREA.

Roads subject to Finalisation

FIGURE 2

LAND PLANNING CONSULTANTS
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SECTION 2 : SOCIO-ECONOMIC ANALYSES

2.1 The Role of the Bremer Bay Region

The Point Henry peninsula is situated a few minutes drive from the small settlement of Bremer Bay. The town serves the surrounding farming area, and provides a base for a small fishing industry. Due to the proximity of the town to the coast and the Fitzgerald River National Park, Bremer Bay experiences a significant influx of recreational visitors in holiday periods.

The study area lies on the edge of the wheat-sheep belt and is administered at local government level by the Shire of Jerramungup, which has its principal office in the town of Jerramungup, 100 kilometres to the north-west.

2.2 Population and Growth

Available population figures for the Shire are difficult to compare and use for extrapolation purposes since census collector district boundaries were varied between 1981 and 1986 to take into account the change in the Shire boundary, and the increase in the significance of the town of Bremer Bay.

However, in the intercensal period 1981-1986 it appears that the population for the Shire rose only slightly from approximately 1390 persons to 1397 persons.

All rural census collector districts experienced a fall in population between 3.5% and 11%, with only the collector districts containing the towns of Jerramungup and Bremer Bay showing increases. The population of Jerramungup increased by 3.7%, while the Bremer Bay collector district increased by 17.4%.

These figures clearly show the marked and growing attraction of the resort town, and the trend towards a fall in the rural population.

Bremer Bay in 1986 had a population of 139 persons at census time in midwinter. Of this figure only 67 (48%) claimed to live in Bremer Bay. The remaining 52% were visitors, mostly from other parts of Western Australia. The role of the settlement as a holiday town is further supported by the finding that of the town's 132 residences, only 32% were occupied at census time.

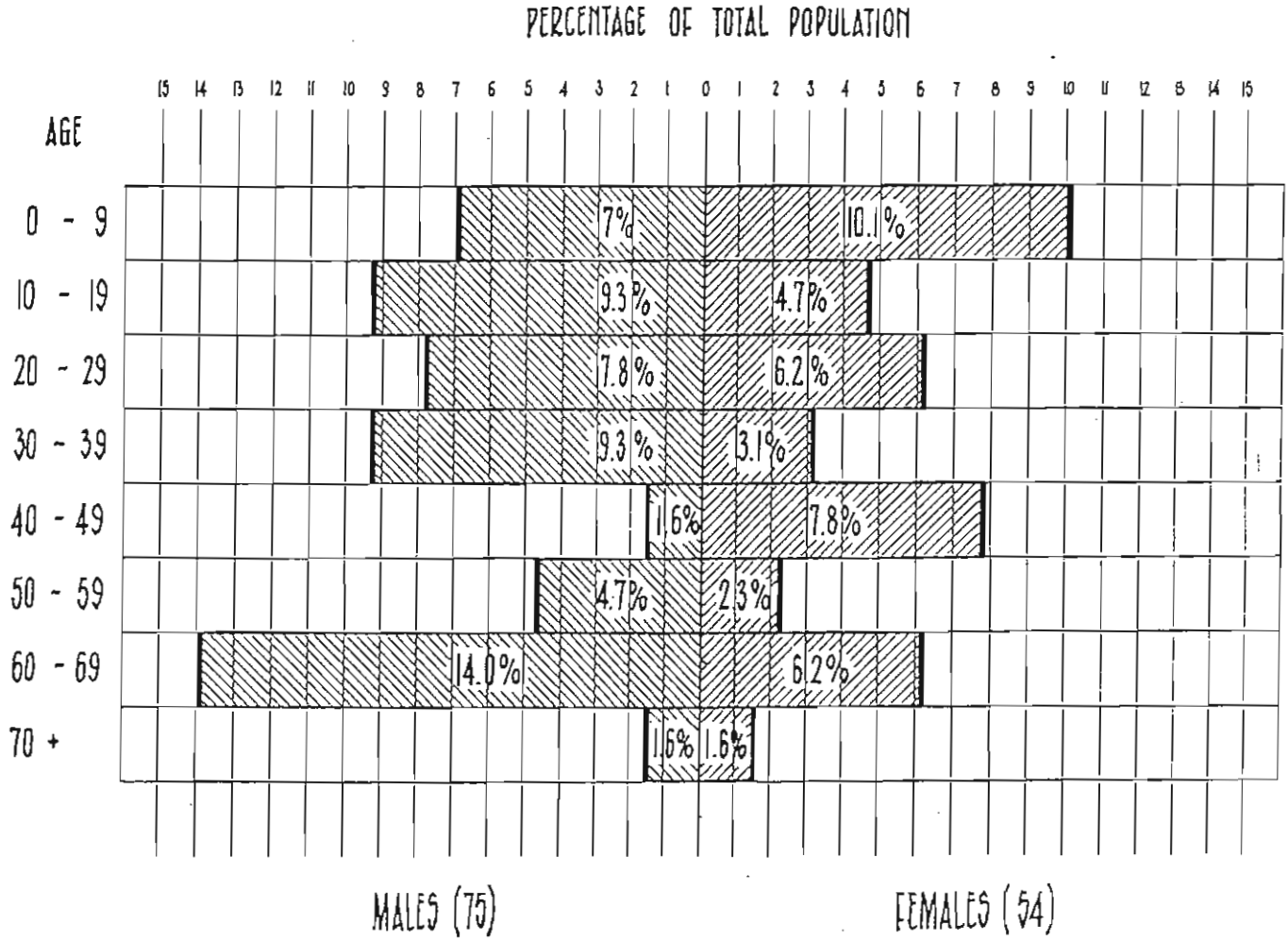
Council officers estimate that there are currently about 120 permanent residents in Bremer Bay, and that 420 people occupy the town's residences during the holiday season.

Building statistics supplied by Council (and referred to in more detail in section 2.4) indicate that the town is continuing to grow and to attract more residents.

As the town grows, opportunities to provide an increased range of services and facilities will be taken up. The establishment of Special Rural precincts on the peninsula, within a short drive of Bremer Bay, will help support the viability of new services in the town.

DEMOGRAPHIC STRUCTURE for BREMER BAY TOWNSITE

~ JUNE 1986 ~



2.3 The Economic Base

2.3.1 Agriculture

The Shire of Jerramungup is primarily an agricultural area. However, the land is not of particular value for agriculture, and, to be viable, farm units near Bremer Bay must be in the order of 800 to 1600 ha. The Jerramungup office of the Department of Agriculture estimates that 80% of local activity is devoted to sheep raising, 10% to oat and barley crops, and 10% to other activities (lupins, wheat, cattle).

Vegetated areas like the peninsula are not in particular demand for agriculture. In fact, agricultural activity is now deterred to some extent through the operation of restrictive clearing controls. The Department of Agriculture is also concerned that land used for farming purposes in such locations as the peninsula is prone to erosion unless well managed.

The peninsula was grazed by the Wellstead family for over 100 years. Cattle and then sheep were run on the property, and pasture fertilised with superphosphate was sown on the flats. However, in 1974 the current owner ceased farming because of the overriding problems associated with grazing. These included:

- an increase in the number of people on the property, attracted by the beaches;
- the prohibitive cost of fencing the peninsula and maintaining fences damaged by trespassers attempting to gain access by 4WD vehicles to the coast;
- the dangers involved with periodic burns, (which are essential to encourage new growth for forage) since trespassers could possibly be trapped.

The combination of the attraction of the peninsula to recreationalists and the Department of Agriculture's clearing restrictions, operates to make traditional commercial farming on the peninsula no longer a practical proposition.

2.3.2 Tourism

Tourism is a rapidly growing activity in the Bremer Bay region. During the holiday seasons, the population of Bremer Bay multiplies dramatically. The area is known for its picturesque and varied coastal scenery, the estuary and waterways and the Fitzgerald River National Park. Activities include fishing, visiting beaches, surfing, exploring, bushwalking, and relaxing in pleasant surrounds. Bremer Bay also provides golf links, and bowling greens.

At the peak of the tourist season Council estimates that Bremer Bay may attract a daytime population of 2,500 people, with 1,000 of this number in the Bremer Bay Caravan Park, 420 in residences and the remainder being day trippers.

Although figures are not available from the Western Australian Tourism Commission or the Australian Bureau of Statistics to confirm trends, it is very clear that the small settlement of Bremer Bay is increasing in popularity as a holiday destination and will continue to do so. We point out that recently a hotel and motel units have been built, a new caravan park on Wellstead Road on the boundary of the study area has been approved, the construction of new roads is underway on the peninsula to provide access to the beaches, houses are going up in Bremer Bay, another town land release is planned for early in 1991 by the Department of Land Administration, and a boat harbour is under investigation at Fishery Beach.

An increase in visitors and permanent residents, drawn by the attractive environment, will help provide a better economic base for the locality and balance the downturns and instability which results from dependence on the primary industry sectors.

2.3.3 Fishing

A small fishing industry is based at Bremer Bay. A fish processing factory is located in the town's industrial zone and approval has been sought for another.

Bremer Bay supports mainly seasonal commercial fishing, based on salmon, herring, tuna, and shark.

Bremer Bay is also considered to offer some of the best recreational fishing opportunities on the south coast. Boating and fishing are amongst the major activities for both visitors and residents.

Boat launching facilities are currently under consideration for Fishery Beach, to serve recreational boat owners, professional fishermen, sea rescue and charter boat operators.

The report prepared by Mark Staniford (1989) on behalf of the Bremer Bay Boating Facilities Working Party advises that:

> "At present Bremer Bay supports two tuna boats and approximately three pilchard boats with occasional visits from vessels to unload shark and scale fish. The difficulty of unloading catches into a dinghy and from the dinghy onto the beach, often in adverse sea conditions, is no doubt both a deterrent to the expansion of the Bremer Bay fishery and a contributor to poor quality product.
>
> It is anticipated that the area can support up to eight boats fishing for pilchards; little change is expected in the number of vessels catching tuna and other species. Catch value could reach $3 million within 3 years. It is considered lack of protected unloading and refuelling facilities will contain the industry at its present level of $0.5 million."

The Department of Marine and Harbours is currently completing studies to determine what type of facility would need to be built at Fishery Beach, to provide a safe harbour adequate for the projected usage.

Consideration of a boat harbour at Fishery Beach has implications for the north-east corner of the study area in terms of the use of the hinterland for support services. Such use, would not be incompatible with low density rural residential development.

2.4 Demand

There are numerous indicators that there would be a strong market for Special Rural lots on the peninsula.

Mr W.M. Wellstead, the owner of Kent Location 206, which is the subject of a Special Rural proposal going back to 1986, continues to receive many calls enquiring when land will be available. Those interested in acquiring a block include people from the Bremer Bay township and the rural hinterland, as well as from the Perth area and interstate (particularly New South Wales).

Real estate agents operating in Albany confirm that they receive many enquiries, particularly during the tourist season, from people who would like to acquire a few acres preferably with views near the ocean. However, in the region, supply to satisfy this demand ranges from low to non-existent.

Since the Bremer Bay area has only recently started to move, with local farmers being the main market to date, and lots suitable for rural-residential purposes being rarely available, demand can only be estimated in very general terms.

Real estate agents point out that the size of the block is not generally of great concern to prospective purchasers, since their aim is primarily to have a house in attractive rural surrounds.

It has also been pointed out that an indicator of demand is the fact that the very high prices for coastal lots now prevail as far south of Perth as Margaret River. People, who are more mobile now and prepared to travel further, are now having to look to Denmark and Albany for more reasonable prices. However, prices similar to Perth's are expected to prevail in this area too within 2 to 3 years, due to the scarcity of such land. An increase in demand for the Bremer Bay area can thus be expected to continue until well into the foreseeable future.

It is envisaged that the demand would be principally from purchasers requiring a weekend retreat or holiday home in attractive surroundings, and that, depending on the price asked, 20-30 blocks a year may be sold, with the better ones i.e. those with coastal views, being snapped up very quickly. The rate of absorption of blocks is also of course a function of the asking price, market conditions and their relative attraction.

Building statistics for the Bremer Bay townsite also provide an indication of the growing demand in the area. In recent years, the number of homes built has increased annually as Table 1 shows.

TABLE 1 - BREMER BAY BUILDING APPROVALS

YEAR	RESIDENCES	NOTES
1987-1988	6	Also hotel approved
1988-1989	10	Motel units approved
1989-1990	14	

In recognition of the demand, the Department of Land Administration is proposing to release 33 more town blocks in January 1991. A previous release occurred in May 1989. Lots will be auctioned, and a condition of sale will be that they are built on within 2 years.

A further indicator for demand is the request from a Dillon Bay landowner for approval to create approximately 30 more lots on a multiple occupancy basis, to supplement the existing provision of such lots. This form of occupancy, however, is not considered desirable.

It is considered that a better solution is to provide opportunities for properly designed and controlled rural residential estates, in approved locations.

2.5 Land Use and Ownership of the Peninsula

The peninsula, after being farmed for over a century, is now no longer grazed and has regrown to the extent that the previous activity is no longer evident to the casual observer.

There is only one residence which is occupied on a permanent basis. This is the Wellstead's residence in the north west part of the study area on Lot 7. Mr W.M. Wellstead has historic links with the locality, since the peninsula has been in his family's care from the time of the original Crown grants, which date from 1850's. The Wellstead family have traditionally been responsible for managing the peninsula and continue to act as unofficial caretakers, to protect the environment from some of the indiscriminate and irresponsible activities of recreational visitors. The main management problems now faced result from 4WD activity off the main tracks, and the lighting of fires and damage to the environment at camp sites.

In addition to another residence on the southern portion of Lot 7, there are six dwellings, either existing or proposed, on the eastern side of the peninsula, all located to gain panoramic views of the coastal scenery. These are occupied or visited on an occasional basis. Figure 3 shows the present use of the

peninsula.

The privately owned land is in seven ownerships altogether, as indicated on Figure 4. While some owners have expressed an interest in the potential of the peninsula for further subdivision, others indicate that they do not expect to subdivide, or could only accept subdivision which is environmentally sensitive and has minimal visual impact.

In the recent past owners have considered undertaking rural activities, including the raising of pigs. It is pointed out that since the existing zoning is Rural such activity is consistent with the purpose of the zone.

The entire coastal periphery is protected as reserved land, with separate reserves over the Black Point and Point Gordon peninsula (B⅄4121 reserved for government requirements), and the southern extremity of the peninsula (B⅄3766 reserved for public utility purposes).

Separate reserves, which are, or are to be, vested in the local Council protect the public access points to Blossoms Beach and Native Dog Beach, Little Boat Harbour and Banky Beach.

The summit of Tooleburrup Hill is also within a reserve.

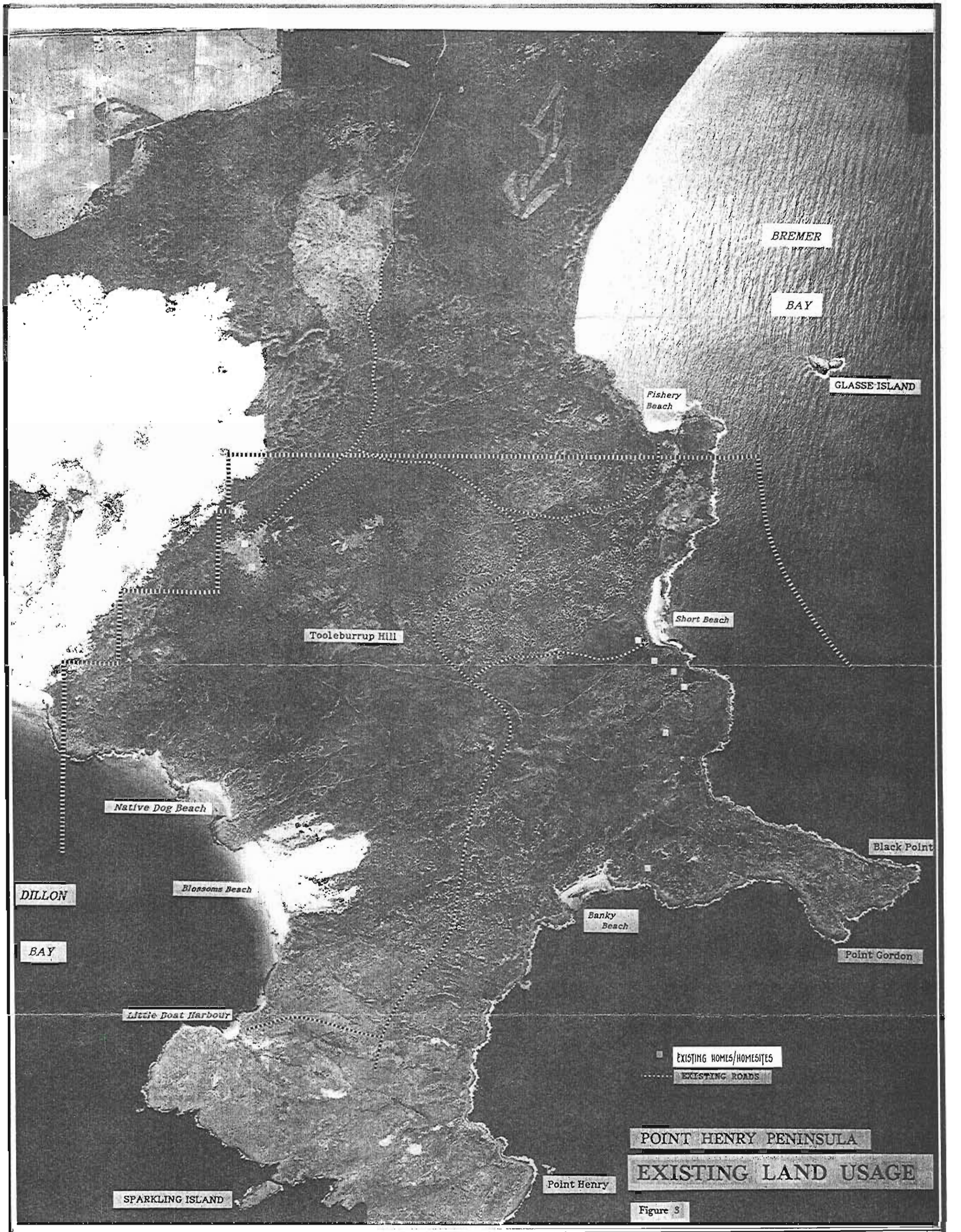
The peninsula is currently being opened up to the public through the construction of roads to replace the previous 4 wheel drive tracks. New roads now provide access to Fishery Beach, and Short Beach, and will eventually access Banky Beach, the southern tip of the peninsula, Little Boat Harbour, Blossoms Beach and Native Dog Beach. Additional accesses are also planned to serve the Point Gordon-Black Point area, Lots 112 and 113, and the Tooleburrup Hill to Dillon Bay area.

Some of the new roads which are currently being constructed or have yet to be constructed involve alterations to existing titles and road reservations. Such alterations are expected to occur when roads are finally surveyed. Thus the existing titles at this stage do not reflect the location of the new roads in all cases.

The Council in association with the Coastal Branch of the Department of Planning and Urban Development is developing basic facilities for each beach on the peninsula. Fishery Beach and Short Beach have been addressed to date, and Little Boat Harbour is expected to be next.

The peninsula provides access to two main boat launching and anchorage locations which serve both the fishing industry and recreational fishermen. These are Little Boat Harbour and Fishery Beach. While the access road to Fishery Beach traverses the study area, the actual beach and anchorage are outside the study area.

From a resource and management point of view, the peninsula constitutes a little used area which is currently being opened up to the public for recreational activity, and amounts to a major management liability and responsibility for the traditional custodians of the peninsula, the Wellstead family. While some of the property owners enjoy the area as a recreational retreat, others do not utilise their landholding. The body of the peninsula is in fact currently used principally for rural residential purposes.



POINT HENRY PENINSULA

EXISTING LAND USAGE

Figure 8

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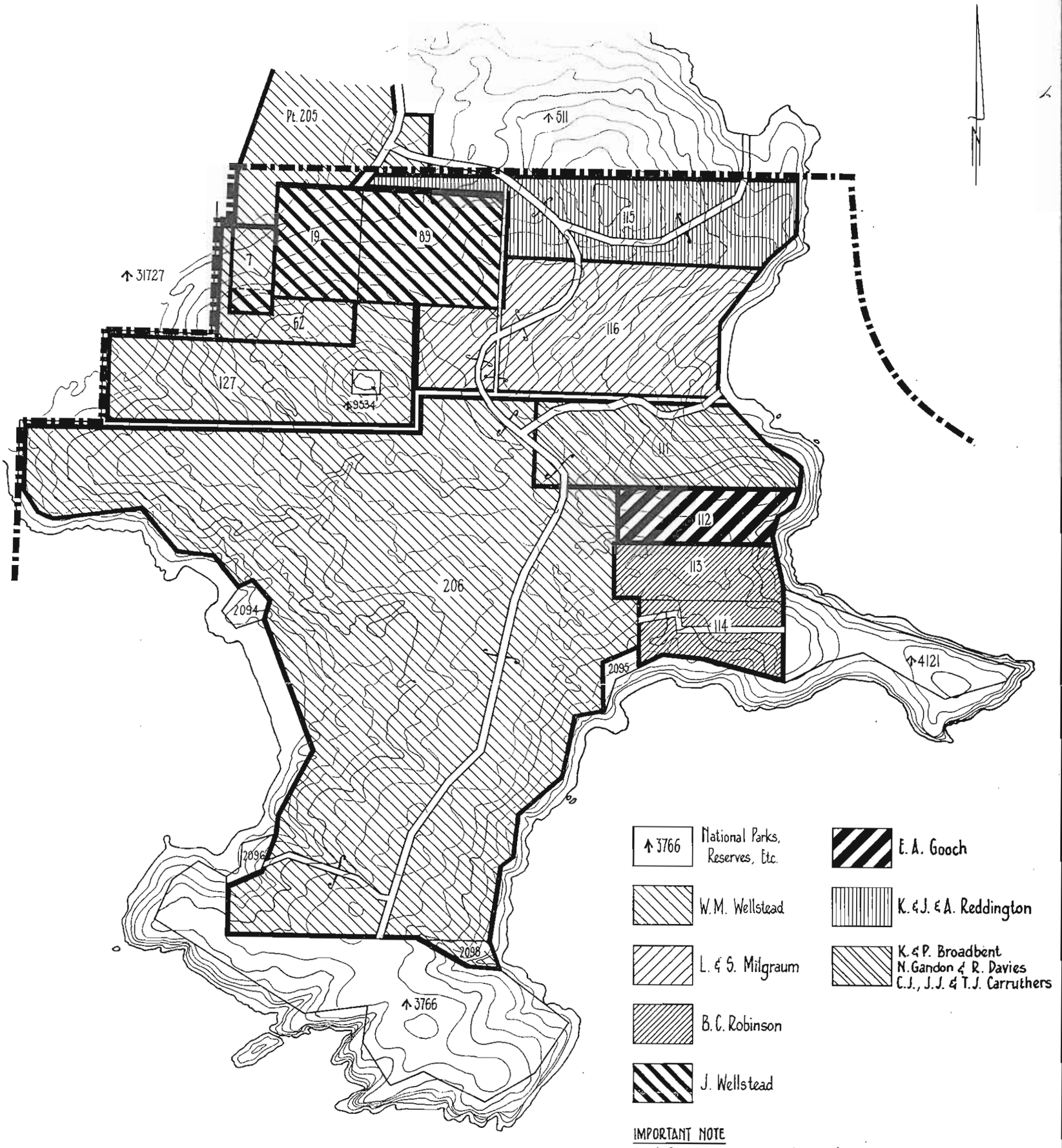

IMPORTANT NOTE

The information contained hereon is based on existing titles as at March 90, but not all road reserves are shown, since new roads are being constructed and are expected to lead to modifications to road reserves and property boundaries in the short term.

Figure 4

POINT HENRY PENINSULA

LAND OWNERSHIP DIAGRAM

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2.6 Planning Proposals

2.6.1 Council and Department of Planning and Urban Development Proposals

The Shire of Jerramungup Town Planning Scheme No. 1 was gazetted on the 20th July 1990.

This Scheme shows most of the study area as rural zoned land.

No Special Rural Zones have been designated within the Scheme. However, the Scheme Report contains three policies one of which refers to the future growth of the Bremer Bay townsite and suggests an area for Special Rural zoning south of the townsite. The Point Henry area is considered to be the only area in the Shire where Special Rural development may be appropriate.

Under current planning policy established by the Department of Planning and Urban Development, Special Rural rezoning is only permitted if consistent with the findings of a Rural Strategy or Limited Rural Strategy.

Since Council indicated that it has not the resources to prepare Rural Strategies the principal land owner on the peninsula has commissioned the undertaking of this Limited Rural Strategy.

The peninsula is not required for urban or other land uses under the Planning Scheme, and the acquisition of further land for recreation purposes is not envisaged under the new Town Planning Scheme.

2.6.2 Land Conservation Proposals

The study area lies within the area covered by the Environmental Protection Authority's System 3 Conservation Reserves Report. Although the two large reserves 3766 and 4121 in the Point Henry and Point Gordon areas are System 3 reserves, there are no recommendations in the System 3 report specific to the study area.

However, management plans covering the study area have been prepared by the Department of Conservation and Land Management and the then Department of Conservation and Environment. These comprise the "South Coast Region Draft Management Plan" (April 1989), and the "Jerramungup Coastal District Draft Management Plan" (November 1984).

The potential of the peninsula has been discussed with the Albany office of the Department of Conservation and Land Management. It was indicated that the peninsula is considered to be too close to Bremer Bay to be of interest for National Park or conservation reserve purposes. It is recognised that Bremer Bay is increasing in popularity as a tourism destination, and that the peninsula is appropriately located to provide more recreational opportunities for tourists.

The Department of Conservation and Land Management prefers to concentrate its resources on the main part of the Fitzgerald River National Park, which occupies an extensive area to the immediate north-east of Bremer Bay.

Under the "South Coast Region Draft Management Plan" no changes in tenure,

vesting or purpose are envisaged for the study area.

However, near the study area some rationalisation of the boundaries of the Fitzgerald River National Park is proposed. The expansion of the National Park through the upgrading of the classification of adjoining reserves, will be balanced by a change in the classification of the isolated part of the National Park which adjoins the western side of the study area, from "A Class Reserve" (A 31737) to "Other Reserve". It is proposed that management of this reserve will become the responsibility of the Shire Council.

A Draft Management Plan for the Jerramungup Coastal District was published in 1984. This Plan specifically addresses the study area.

The Plan points out that:

> "The five beaches on this peninsula offer a range of conditions suited to swimming, fishing, surfing, diving, boat launching and picnicking. However the area has received little use as beach access has been through private property and limited to 4WD tracks. The recommendation to facilitate recreational use of the peninsula by vesting the foreshore reserve with Jerramungup Shire Council and providing public road access will greatly increase land use and complement the development of Bremer Bay." (p.27)

Recommendations in the Plan include access and facilities for Little Boat Harbour, Blossoms Beach, Native Dog Beach, Banky Beach and Short Beach, and the provision of a carpark on the top of Tooleburrup Hill so that the public can gain vistas of the coastline.

Importantly, the Management Plan also recommends a full-time ranger for the coastal district responsible for patrol and public education, garbage control, and minor development and maintenance works.

The plan recommends that "the Ranger's duties (be extended) to include this area when the proposed upgraded roads will increase visitor numbers". (p30)

2.6.3 Development Proposals for Beaches

Progress in line with that envisaged in the Plan is now occurring. A Council committee, attended by a representative from the coastal planning section of the Department of Planning and Urban Development, is working towards the provision of facilities for the designated beaches as access roads are constructed. Fishery Beach and Short Beach have now been attended to, and will be followed by the upgrading of facilities at Little Boat Harbour. Funding has been provided jointly by the Department of Planning and Urban Development and the Shire Council.

The beaches will be developed to differing degrees to reflect their differing roles. A higher level of facilities are thus proposed for Short Beach and Little Boat Harbour, compared with the other beaches.

2.7 Cultural Heritage

The Wellstead family settled at Peppermint Grove on Point Henry Peninsula in the 1850's and descendants of the family continue to own and manage much of the peninsula. However, apart from the homestead buildings on Lot 7 which form part of the existing residential complex, there are no further items of particular interest on the remainder of the peninsula, relating to our pioneering days.

In earlier times the area was visited by Aboriginal groups. It is understood that their camps were of a short term nature since they preferred inland locations. The Western Australian Museum's Department of Aboriginal Sites advises that there are two known Aboriginal sites in the study area. These consist of an artifact site at Blossoms Beach, and a camp and water source site near the Wellstead homestead. Written advice has been supplied by the Department of Aboriginal Sites.

The owner of the homestead referred to above indicates that he is not interested in subdivision in the vicinity of his residence.

The other site is near the coastal fringe where Special Rural development is not envisaged.

An officer of the Department has previously searched for surface scatters of marine shells and other occupational debris which are believed to be located on the Point Henry headland. However, he was unable to find any of these sites possibly because of thick undergrowth.

It is pointed out that any potential development would be of relatively low density and would be set back from the coastal fringe and headlands. There would thus be ample opportunity for roads and dwellings to avoid known sites in the detailed planning stages.

Council's approved Town Planning Scheme identifies places considered by Council to be of historic, architectural, scientific, scenic or other value, as " Places of Heritage Value", and lists these in Schedule No. V. Of the two places listed, neither is on the peninsula.

2.8 Implications of Rural Subdivision

This section identifies implications of rural-residential subdivision, which particularly affect administration responsibilities of the Shire of Jerramungup.

The impacts addressed include rates, economic impacts, management implications for the Shire, and the requirements of the new population.

2.8.1. Rates

The issue of rates has been a contentious one particularly in the Bremer Ward of the Shire of Jerramungup. In 1987 new valuations by the Valuer General's

Department (the first since 1980) lead to corresponding increases in rates levied on properties. The re-evaluations reflected the higher prices being paid for scenically attractive rural holdings.

Bushland lots on the peninsula which are unused, or used for residential purposes only, experienced an increase in the annual rates levy from 2.3 to 7.8 times, between 1987 and 1988. In 1988 rates for the properties on the eastern side of the peninsula varied between approximately $800 and $2,100. On a block valued at $35,000 in 1988, the rates levied were $1,837.50.

Understandably, owners continue to be very concerned and upset by their rates, particularly since the properties are either not used in any way or are only occasionally visited for recreational purposes, and minimal use is made of Council facilities and services. Due to their size, and to current clearing restrictions, these lots are also unsuitable for farming or other income producing activities.

As the demand for lots in scenic locations increases, but the supply fails to keep pace, the valuations and consequently the rates on such properties can be expected to escalate, unless a different rate is struck for such properties.

Council has indicated, in recent times, that it may consider applying a different rate to those rural properties which are used for residential purposes only, and do not generate an income. A different zoning on such land, to ensure that the land is only used for residential purposes and that other conditions are complied with, has been mooted by Council.

The rates issues and options were outlined in a report prepared in September 1989 by the Shire of Jerramungup entitled" Special Design Area Land Use: Differential Rating".

The Department of Planning indicated to Council that rezonings on the Peninsula, for any purpose, could not be considered on a piecemeal basis, and, as a prerequisite, in line with the Department's rural policy, specified that a Rural Strategy, or at least a Limited Rural Strategy, should be prepared.

The subject Limited Rural Strategy is thus of significance to landowners on the peninsula, for differing reasons. For some, it is seen as the vehicle for establishing criteria and conditions for Special Rural development. For others, however, who are not in the foreseeable future interested in such development, it is seen as a step which appears to have to be undergone to achieve such zoning changes as the Council believes are necessary to justify lower rates.

It is reasonable to expect that eventually rates on properties used for rural-residential purposes only, which have no further subdivision potential, will be subject to a different rate.

The revenue generated by Special Rural development will, of course, be dependent on the amount of subdivision and the differential rate eventually applied to such development.

2.8.2 Economic Impacts

In addition to generating more rates, Special Rural development on the peninsula will have the advantage of increasing the demand for services provided by local businesses, thus improving the level of economic activity in the region and encouraging a diversification and stability in the economical base. This is of special value to the region since it is heavily weighted towards primary production. Hand in hand with tourism and recreational activity, Special Rural development in the Bremer Bay area can assist to buffer the local economic downturns in agricultural markets.

2.8.3 Management Implications

Management Implications of Recreational Use of Peninsula

By actively pursuing programmes to open up the five peninsula beaches to the public, the Council faces currently greater management responsibilities in the area, irrespective of the Special Rural development proposals.

These include:

- maintenance of beach areas, erosion control, protection of surrounding vegetation and landforms, litter control, prevention of fires, camping control, provision of beach nodal facilities, prevention of dumping of domestic animals, control of use of vehicles off-road, control of spread of noxious weeds and die-back, and maintenance of carparks, access ways (pedestrian and vehicular) and other facilities.
- maintenance of the network of access roads.
- appointment of a ranger and honorary rangers to manage the beaches.

The Jerramungup Coastal District Draft Management Plan (1984) noted that:

> "Tourism is continuing to grow in the Bremer Bay environs and Council recognises that the coastal zone requires an intensive level of management."

It was recommended that a full-time ranger for the coastal district be employed to undertake the following duties:

"1. Patrol and Public Education
The ranger will be required to prohibit or report activities that oppose the management objectives. He will serve as a public relations officer between Council and visitors to the area. He should also be involved in providing advice for management plans.

2. Garbage and Litter Control
During holiday periods, garbage and toilet cleaning operations need to be undertaken on a regular basis. At other times, these duties will be undertaken as required. The ranger will be assisted by Council to organise busy bees for litter removal on remote beaches.

3. The ranger will undertake a variety of minor development and maintenance works during non-holiday periods. They will include small soil stabilisation and beach management projects, landscaping, and the erection and maintenance of signs and fences."

The Peninsula is facing change and increased need for management irrespective of Special Rural development proposals.

Management Implications of Rural Residential Development

Management implications associated with locating rural residential land uses adjacent to recreation and conservation areas include the following:

- control of indiscriminate access from rural residential properties to the coastline and scenic areas;
- control of domestic animals;
- control (prohibition) of use of vehicles off-road;
- fire protection;
- control of spread of noxious weeds and diseases, particularly die-back.

Additional management responsibilities include the policing of Planning Scheme controls, rubbish disposal, and the provision of community and recreation facilities. All these functions are currently provided by Council.

The close proximity of the peninsula to the Bremer Bay settlement, an existing and growing focus of council services, minimises the administrative inconvenience which occurs with more outlying developments.

Since Bremer Bay township is growing at a rapid rate, Council can expect to commit more resources and administration to the area regardless of development on the adjoining peninsula.

It makes practical sense for a Special Rural area for the Shire to be located where change is occurring and where it can benefit from the eventual upgrading and increase in services and administrative activities which will need to be provided for Bremer Bay.

Facilities provided at Bremer Bay are outlined in Section 6.6.

2.8.4 Requirements of the New Population

It is expected that purchasers of Special Rural properties would be atypical compared with the general population, comprising mainly part-time residents occupying property for holiday retreat purposes, and retired people from the immediate hinterland as well as areas further afield. People providing services to Bremer Bay and local districts, as well as families with jobs in the area including local fishermen, could provide a core of permanent residents.

As is the case for Bremer Bay, a demographic graph for the Special Rural development may be very irregular, and may change dramatically in a relatively short time as the estate grows.

Bremer Bay is very much a holiday settlement with 52% of residences vacant in winter. It is expected that development on the peninsula could show a similar pattern of occupancy.

Due to the proximity of the peninsula to Bremer Bay, it is probable that many potential new residents would locate on the peninsula if there was a choice, and that the characteristics of the population would not be substantially different from the townsite's. Apart from a relatively higher proportion of over 55 year olds, other age groups are not likely to show particular trends until the settlement is fully developed and stabilises.

It is not envisaged that the residents in any Special Rural development would have notably different requirements from Bremer Bay residents, as far as Council services are concerned.

SECTION 3 : PHYSICAL CHARACTERISTICS

This section provides an overview of the physical characteristics of the study area. The characteristics addressed are physiography, slope, vegetation, geology, soils, erosion, water resources, climate and fire hazard.

3.1 Physiography

As Figure 5 indicates, the landforms are varied, with rolling hills, valleys, some deeper ravines, a mobile dune system and a scenic coastline. Steep granitic coastal slopes give way intermittently to sandy beaches, each with its own character. Limestone, granitic and sand landforms are evident.

A spine of higher ground winds down the peninsula in an overall north-south direction. From this, several main spurs descend in generally easterly or westerly directions, to the ocean. The main spine and spurs are generally broadly rounded.

The highest point is Tooleburrup Hill, a rounded hill with some granitic outcrops, 156m high, from which views in all directions are attained. The views of the peninsula gained from Mt Tooleburrup are of broad low green undulations surrounded by ocean.

A number of short drainage lines descend to the coast. These are occupied by small intermittent streams during winter. There is only one permanent stream on the eastern side of the peninsula near the tip of Point Henry, on Lot 2098.

3.2 Slope

The peninsula is generally undulating, with intermittent areas of flat land. As the slope map (Figure 6) shows, approximately three-quarters of the peninsula is occupied by slopes which are less than 10%.

The central part of the peninsula tends to contain the more gentle slopes, with steeper land adjoining the coastline and some valleys, and around Tooleburrup Hill.

It should be noted that the slope categories are generalised and are subject to more detailed surveying, or on site checks.

Slopes of 0^{o}-6^{o} are generally considered ideal for dwelling purposes. Slopes between 6^{o} and 10^{o} may need more site works, special construction techniques, and careful location of septic absorption sites and access routes. Slopes between 10^{o}-14^{o} are less desirable and slopes over 14^{o} are too steep to consider.

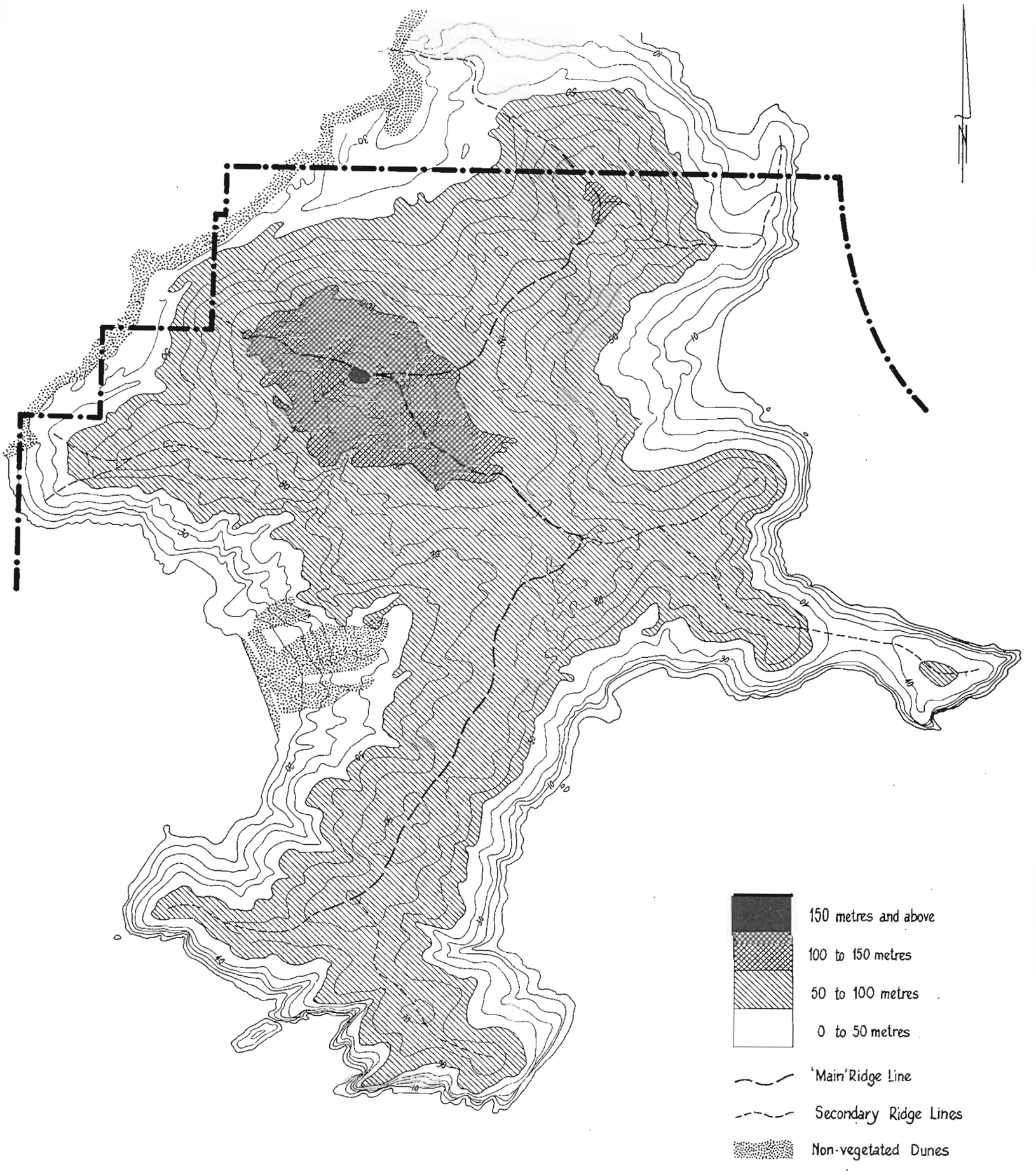

Figure 5

POINT HENRY PENINSULA

PHYSIOGRAPHY DIAGRAM

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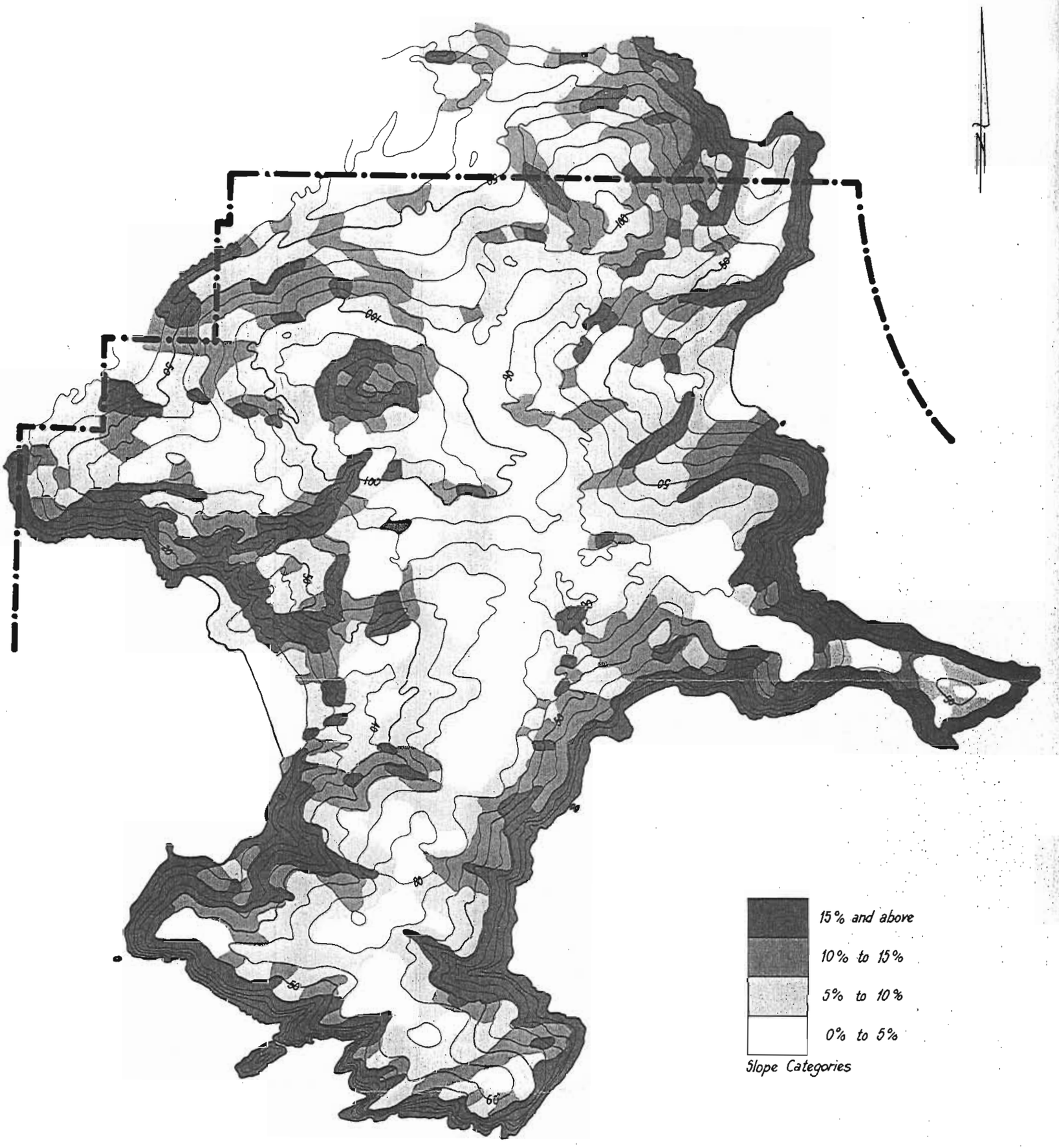

Figure 6

POINT HENRY PENINSULA

SLOPE CATEGORIES MAP

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3.3 Vegetation

The peninsula is covered by generally dense vegetation in an intricate mosaic of plant communities. The vegetation types have been mapped by Dr Arthur Weston. His report on the native vegetation and significant flora of Point Henry Peninsula is included as Appendix 3 in this report. The major vegetation types identified by Dr Weston are shown in Figure 7.

There are several important reasons why the vegetation has been studied in some detail. Most significantly, the various plant communities provide habitats for a diversity of fauna species. Controls to protect the vegetation will thus have the effect of protecting associated fauna.

Another reason why the vegetation has been studied in some detail is that it dominates foreground and midground views, and influences the viewer's perception of the peninsula.

Vegetation also provides clues on the depth, type and quality of underlying soil.

Dr Weston's summary of the vegetation of the peninsula informs that:

> "Essentially, the principal vegetation communities on the peninsula are:
>
> - mallee shrublands, low woodlands and low forests to 15m tall dominated by peppermint (*Agonis flexuosa)* and *Acacia cyclops*, chiefly on sandy, sheltered soils,
> - *Eucalyptus angulosa* mallee thickets, on a few limestone ridges slopes and gullies,
> - mixed heaths, often characterised by *Dryandra pteridifolia* and other domed shrubs on granite uplands, by *Hakea trifurcata* on the northeastern granite point, by *Dryandra sessilis* on upland limestone soils and by *Phebalium rude* and *Spyridium globulosum* on steep coastal slopes,
> - thickets of *Melaleuca pentagona, Melaleuca lanceolata* and *Melaleuca sp.*, and
> - coastal vegetation of established aliens and native grasses, sedges and small shrubs.
>
> No declared rare flora (DRF) species, Priority species or other significant was identified during the survey. It is possible, however, that at least one DRF or Priority species or other significant species is present, although the botanical survey done was reasonably thorough and representative for the time of the year when it was done. The majority of significant species which might occur on the peninsula are not in flower in July and therefore could easily have been missed during the survey."

The possibility of declared rare flora species on the site was also checked with the Department of Conservation and Land Management's Albany office. C.A.L.M. advised that no declared rare flora species have been recorded for the peninsula, and Ken Newbey in Newbey, K.R. (February 1987), stated that he did not identify any such species during his site visit.

Ken Newbey notes that the most common vegetation community is dominated by coastal peppermint (*Agonis flexuosa*) which varies from 5-6m tall inland, to 3-4m closer to the ocean. Under it grow sedges and woody shrubs mainly up to 2m high.

The vegetation is generally in excellent condition and although many of the flats were cleared and planted with pasture, most populations of pasture grasses have disappeared.

Newbey refers to the vegetation as "attractive but does not have a high uniqueness value."

Newbey (February 1987) also points out that:

> "An important aspect of the vegetation is the large proportion of plant species which regenerate by suckering after fire. Some species that regenerate from seed also grow quickly e.g. some Wattles (Acacia species). The main plants that stabilize most of the peninsula's soil are Coastal Peppermint and a few sedge species. The former has an extensive root system while sedges have dense and shallow root systems. Both regenerate freely after fire and Coastal Peppermint makes quick growth. Depending on the amount of exposure, they may grow to 2.5m high by 2.5m wide 18 months after fire."

It is proposed that clearing for housing and road purposes should be to the minimum extent compatible with achieving a satisfactory level of fire protection, and further that housing should be located so that it is screened from view of roads and adjoining lots. These aspects are further addressed in Section 7 of this report.

3.4 GEOLOGY

3.4.1 Geological History

The peninsula owes its origins to the formation of a large body of gneiss and granodioritic gneiss, between 1300 and 1500 million years ago. Tooleburrup Hill, now a rounded mound 156m in height is the highest remaining part of this formation. Other outcrops of gneiss are visible throughout the peninsula and are particularly evident as cliffs around the perimeter of the peninsula, and on the Point Gordon and Point Henry headlands.

A number of major events have sculpted the original Proterozoic gneiss.

Between 40 and 43 million years ago, the sea level rose about 150m above its present level, and weathered away any soils and overlying strata which may have developed.

The next important event occurred about 125,000 years ago, during the last major Ice Age, when the sea level fell about 80m below it present level. The low sea level and dry climate which accompany an Ice Age, had a major impact on the bare granite hill. Large areas of coastal sea floor, including all of Dillon Bay, were exposed e.g. all of Dillon Bay. Sands and silt on the sea floor became windblown under the dry climate. They were blown over the granite hill from the west to form a series of sand dunes. The sands and silts contained large amounts of calcium carbonate in the form of ground-up seashells.

Remnants of these dunes persist as a thin covering of coastal limestone, which underlies most of the peninsula. In places this limestone outcrops as low stony ridges rarely exceeding 2m in height.

The last minor Ice Age occurred about 15,000 years ago, when again the climate was markedly drier than at present. The vegetation on some sand dunes became too sparse for stability and the dunes became mobile. Although the climate later became milder, the Blossoms Beach dunes remained unvegetated. However most sand became stabilised with vegetation.

3.4.2 Geological Units

The main geological units have been mapped by the Geological Survey of Western Australia as Proterozoic gneiss (Ꝑhn), dune and beach sand without vegetation (Qf), sand with vegetation (Qn), and coastal limestone (Qpl), as shown on Figure 7. While the geology has given rise to the scenically interesting and varied landforms of the peninsula, no specially significant features exist.

3.4.3 Economic Geology

The report prepared by the Geological Survey of Western Australia, which accompanies the "Bremer Bay" geological map indicates that there are no formations on the peninsula of interest from an economic geology point of view.

There are no mining leases in the study area.

3.5 Soils

As reflected in the pattern of vegetation communities, the soils of the peninsula constitute a complex mosaic of different profiles. For the purposes of the Limited Rural Strategy, three main soil types have been identified.

- soils which have developed over the granitic bedrock
- soils which have developed over limestone
- deep sands

These soil types intermingle with outcrops of the granitic bedrock and limestone ridges. Frequently, within a short distance, widely varying soil types can be encountered.

The soils map (Figure 9) has been prepared from the stereoscopic study of colour aerial photographs, and site inspections (including soil auguring), and has been checked against the vegetation map and local knowledge.

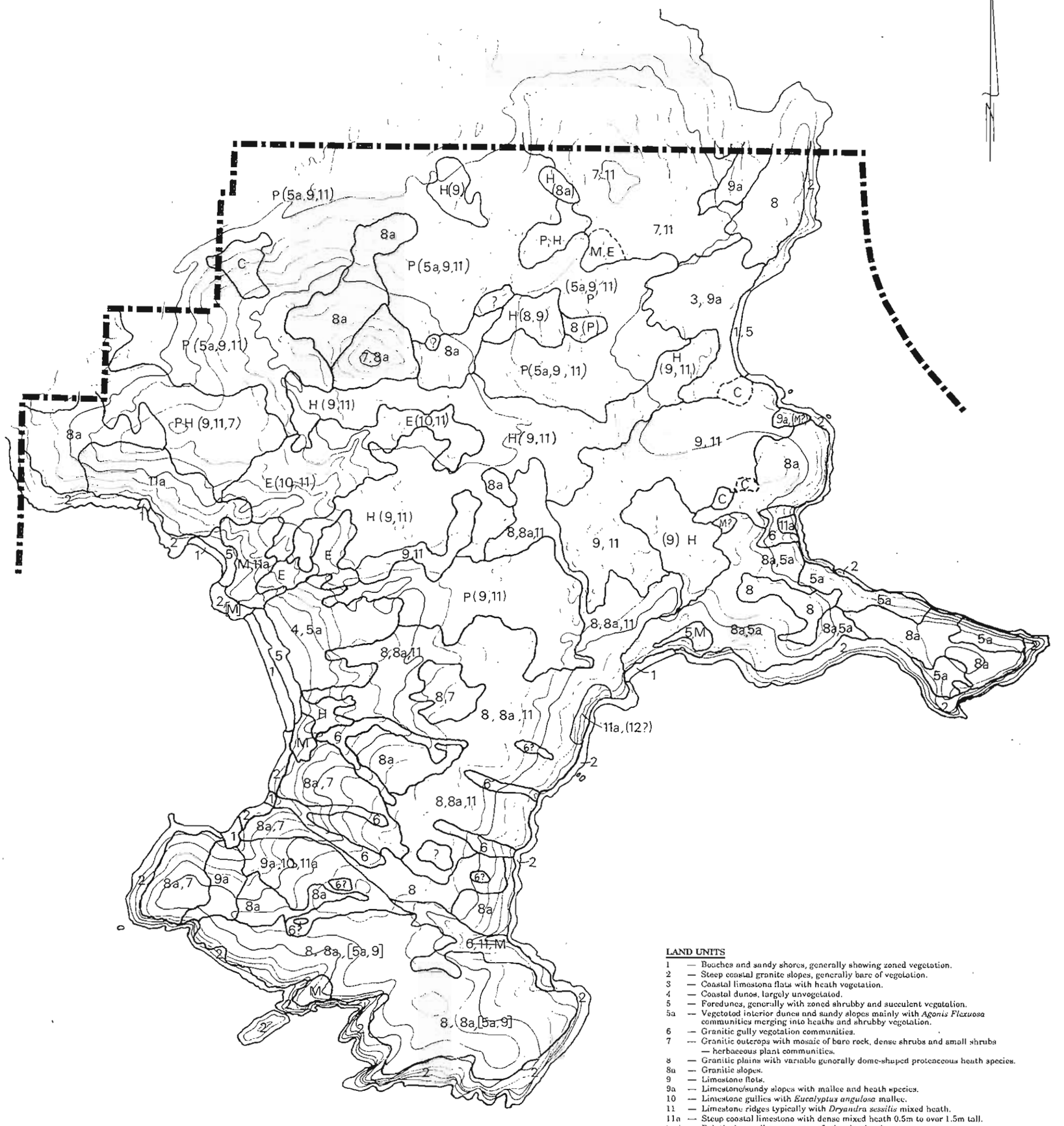
The above soil categories are further discussed below.

3.5.1 Deep sands

Sandy soils over 1m in depth occur either as extensive deposits and ridges, or in pockets, throughout the peninsula. These soils are well drained and may be much deeper in places. In dune swales a greater development of a humic layer occurs. On the deeper sands, peppermint (*Agonis flexuosa)* woodland grows taller. While most of the sandy soils are acceptable for the forms of low density development envisaged, some dune sands near the southern end of the peninsula, and the neck of the Point Gordon headland, are very prone to erosion. Minimal, or no disturbance, of vegetation on the slopes of such sand dunes is essential to minimise erosion. Blowouts which occurred before settlement exist behind Blossoms Beach and on Reserve 31737, to the west of the study area.

3.5.2 Soils which have developed over gneiss

Soils over the granitic bedrock have a typically reddish-brown colour and contain sand, loam and clay in varying proportions, and at various depths in the soil profile. Generally these soils do not appear to be deep. They are estimated to be up to about 1m in depth, but are often quite shallow (15cm-20cm), and intermingle with granitic outcrops. Changes in soil depth may, however, occur quite rapidly. Shallow granitic soils become waterlogged and may remain boggy for some months. Care must be taken with construction and effluent disposal in the vicinity of these soils. No development shall occur where the granitic bedrock is close to the surface.



LAND UNITS

1 — Beaches and sandy shores, generally showing zoned vegetation.
2 — Steep coastal granite slopes, generally bare of vegetation.
3 — Coastal limestone flats with heath vegetation.
4 — Coastal dunes, largely unvegetated.
5 — Foredunes, generally with zoned shrubby and succulent vegetation.
5a — Vegetated interior dunes and sandy slopes mainly with *Agonis Flexuosa* communities merging into heaths and shrubby vegetation.
6 — Granitic gully vegetation communities.
7 — Granitic outcrops with mosaic of bare rock, dense shrubs and small shrubs — herbaceous plant communities.
8 — Granitic plains with variable generally dome-shaped proteaceous heath species.
8a — Granitic slopes.
9 — Limestone flats.
9a — Limestone/sandy slopes with mallee and heath species.
10 — Limestone gullies with *Eucalyptus angulosa* mallee.
11 — Limestone ridges typically with *Dryandra sessilis* mixed heath.
11a — Steep coastal limestone with dense mixed heath 0.5m to over 1.5m tall.
| | — Relatively small occurrences of other land units.

VEGETATION

C — Clearing.
E — *Eucalyptus angulosa mallee.*
H — Heath Communities.
M — *Melaleuca lanceolata* and *Melaleuca* species thickets on seasonally wet areas.
P — *Agonis flexuosa* low woodland and low forest.
* For more details on vegetation types see Appendix 3.

Figure 7

POINT HENRY PENINSULA

LAND UNITS AND VEGETATION

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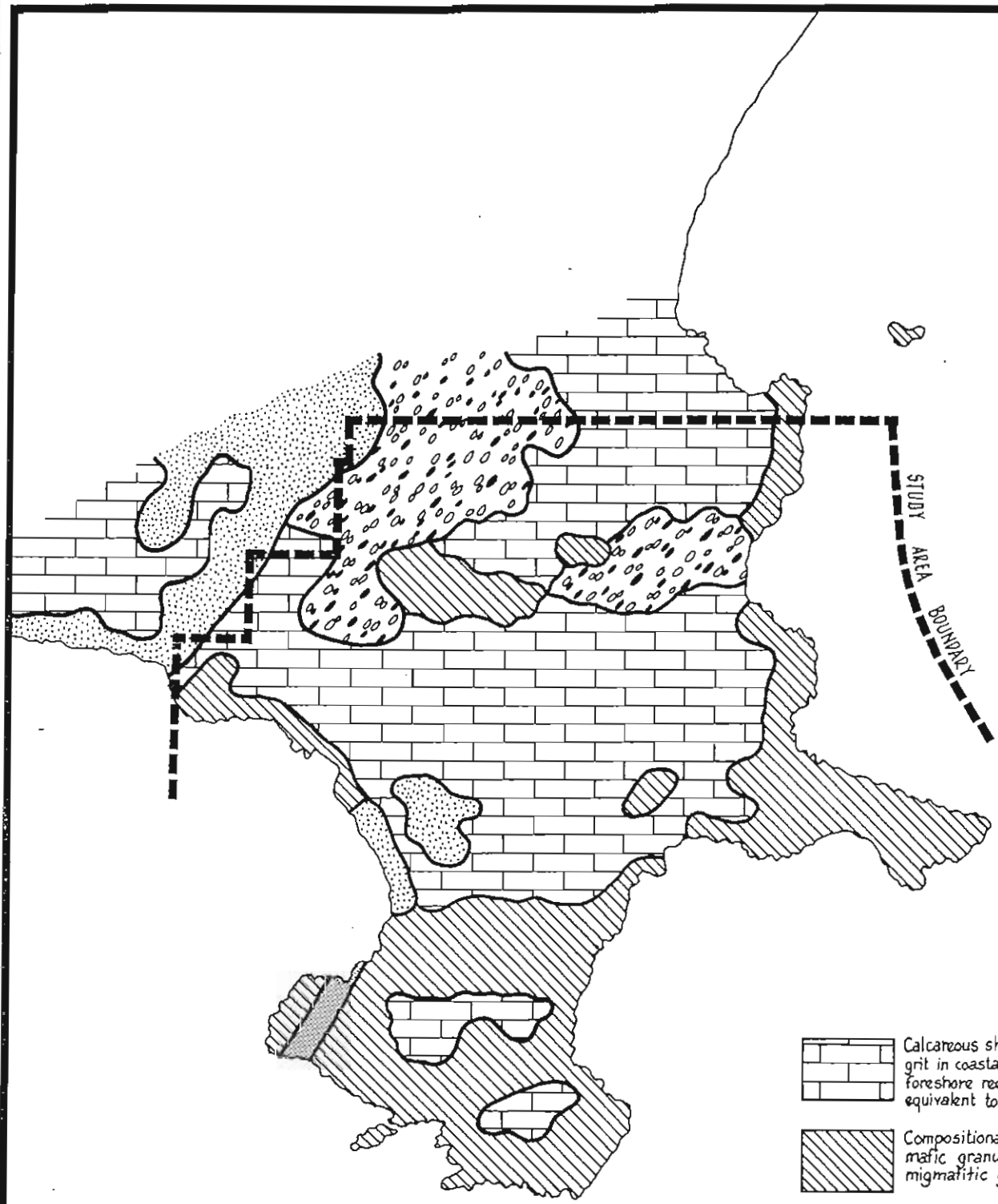

Calcareous shelly sandstone and grit in coastal dunes, sheets and foreshore reefs, may be equivalent to Tamala Limestone.

Compositionally layered gneiss, mafic granulite and migmatitic granulite.

Eolian sand in vegetated dunes.

Mobile sand in un-vegetated dunes and beach deposits.

Augen gneiss.

Figure 8

Compiled from the 'Bremer Bay' sheet of the 1:250,000 Geological Series prepared by the Geological Survey of Western Australia.

GEOLOGY OF THE POINT HENRY PENINSULA

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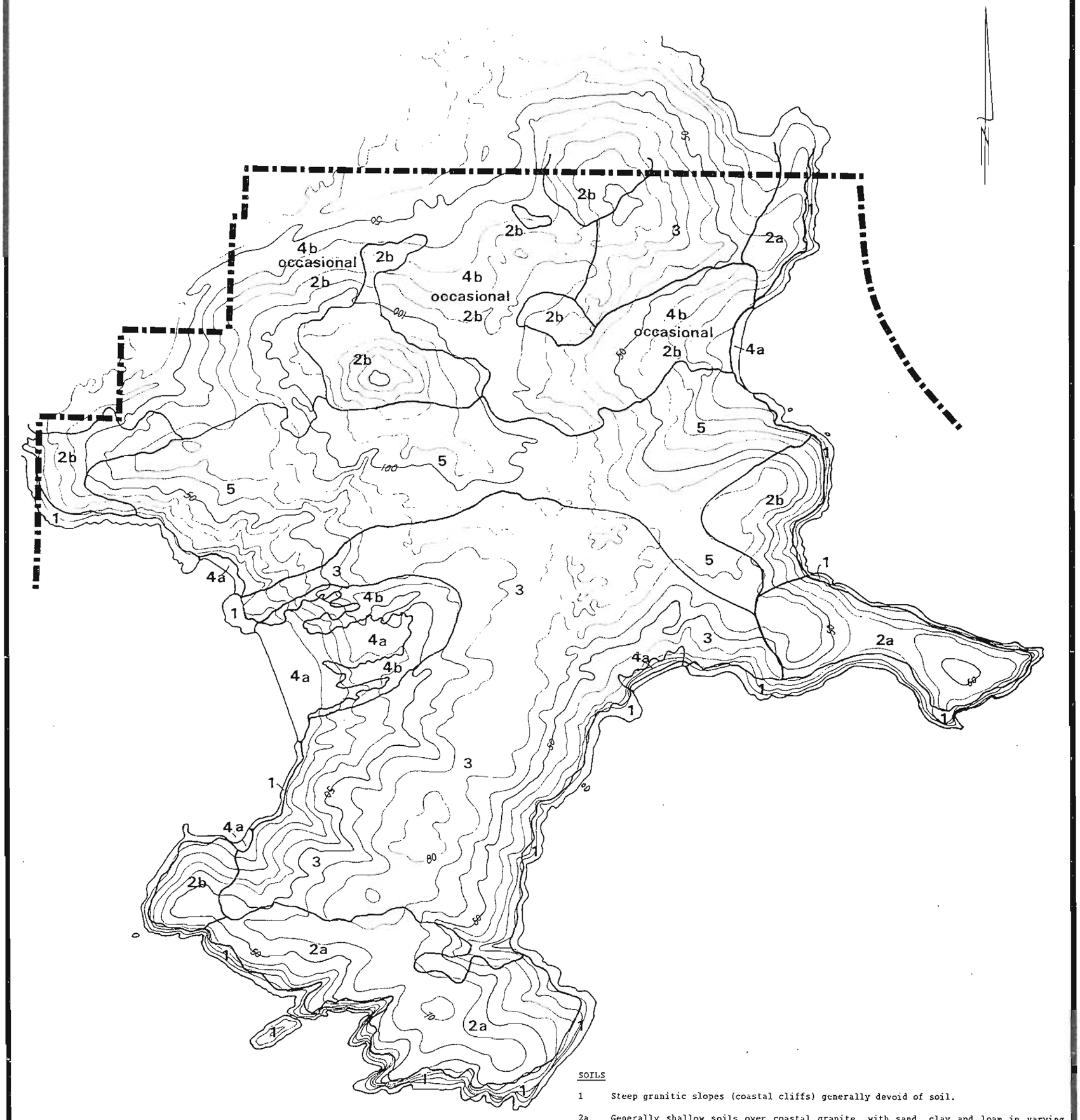
DATE: 11 Sept. 90 DRAWN: D.BRIMSON

NOTE:
All Areas and Dimensions are subject to survey.



SOILS

1 Steep granitic slopes (coastal cliffs) generally devoid of soil.

2a Generally shallow soils over coastal granite, with sand, clay and loam in varying mixtures.

2b Granitic outcrops and soils of variable depth, including pockets of deeper soils over the granitic bedrock.

3 Soils very variable, comprising a complex mosaic of limestone ridges, sand at variable depth over limestone, granitic outcrops, sand and clay over granitic bedrock, and sand ridges.

4a Exposed sand on beaches and in sand dunes. Behind Blossoms Beach the foredune is stabilizing. However, the dunes further from the beach remain mobile.

4b Deep sandy soils with dense vegetation cover.

5 Predominantly sand of variable depth over limestone, and limestone ridges.

Figure 9

POINT HENRY PENINSULA

SOIL TYPES

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Revised in April 1991.

3.5.3 Soils which have developed over limestone

These soils also are of varying depths, from a few centimetres in the vicinity of limestone outcrops, to over 1m in the flats. Near the outcrops, shallow sandy soils over rubbly weathered limestone are typical, while in hollows, fertile colluvial limestone soils with a black surface layer containing a high humus content, are found. The soils vary between light grey and black in colour, and are well drained. Where limestone is close to the surface, again care must be taken to find the best location for building and effluent disposal areas. No development shall occur where limestone is close to the surface.

3.6 Erosion

3.6.1 Erosion due to Natural Forces

While most of the peninsula is in good condition, there is evidence of erosion due to natural forces in three notable areas:

- the mobile dune system west of the study area
- the mobile dune system behind Blossoms Beach
- the recently eroded cliffs behind Banky Beach.

Aerial photographs of the three areas have been studied. Photographs were obtained for the years 1969, 1976, 1982 and 1987.

These photographs show that the foredune immediately behind Blossoms Beach is revegetating, as are the northern and southern parts of the dune system behind the beach. However, there is evidence that prior to this period, there was a setback and vegetated dunes were damaged. This may have been due to grazing activity which has since ceased.

The leading edge of the Blossoms Beach dune system is advancing in a north-easterly direction. While distortion of aerial photography makes it difficult to make statements on the rate of advancement, preliminary study indicates that the rate may be up to 1m per annum on some limited parts of the leading edge. For rural residential development to occur in the vicinity, it is important that either a buffer of minimum width of 100m is provided and/or efforts are made to stabilise the system.

A study of aerial photographs also shows that the eastern edge of the extensive dune system north of Dillon Bay adjoining the study area is stabilising through revegetation, and poses no threat to the study area. The leading edge of the system is, however, still gradually advancing in a north easterly direction.

It is relevant to note that efforts made in the past by the Wellstead family to plant a section of the dunes near the homestead proved successful.

Banky Beach has experienced erosion by wave and storm action. A severe storm

in the early 1980's caused the sand and limestone cliff behind the beach to collapse and recede significantly.

However, since the coastline is generally edged by granitic cliffs which are relatively resistant to the constant pounding by the ocean, wave erosion may be limited to Blossoms Beach (R. Oma, 1986) and Banky Beach. It is thus appropriate that land in the vicinity of such beaches is not developed. It is understood that swells are mainly from the south-west, but to a lesser extent may come from the south-east (R. Oma, 1986).

Short Beach is protected by a reef not far off shore. The boundaries of the reserve behind Banky Beach have already taken into account recession due to storm and wave action.

The identification of environmental protection areas behind the beaches is addressed in Section 7 of this report.

The peninsula is subject to wind, water and wave erosion. Wind erosion is generally more significant closer to the coast and on eastern and western exposed slopes. The degree of wind pruning of the vegetation and its average height are indicators of locations where strong winds are experienced.

Although the rainfall is not considered to be particularly erosive, sheet and gully flow on sloping land can result in water erosion where the soil has been disturbed and the land surface is not sufficiently stabilised.

3.6.2 Erosion by Human Action

Although, as stated, the peninsula is overall in good condition, man made erosion is evident and a potential problem. Controls to ensure that any modifications to the environment do not lead to land degradation, are necessary.

Existing erosion due to man's activity is evident along some 4WD tracks, and particularly by sections of the new roads, which are yet to be completed. A section of sand dune near the southern end of the peninsula has also become unstable as a result of past grazing activity. Sand ridges with steep slopes are particularly prone to erosion.

The fact that the peninsula is generally in excellent condition, following over 100 years of grazing, however, clearly shows that erosion can be avoided if careful management practices are employed.

The necessity for management controls to ensure that further development is not associated with erosion is addressed in Section 7 of this report.

3.7 Water Resources

It is believed that there are limited permanent natural supplies of water on the peninsula.

With the exception of a stream on the eastern side of the peninsula near Point Henry, which flows all year round, all water courses are of a seasonal nature only.

Advice from those with local knowledge, and the Groundwater Hydrology Section of the Mines Department, is that substantial underground water supplies are unlikely to occue in the study area. However, several soaks are known to exist, and, given the limestone substrata, it is likely that underground water may be available in some locations. The extraction of ground water does not require a licence within the study area.

There are groundwater supplies to the north of the study area. However, in this area the extraction of groundwater does require the approval of the Water Authority of Western Australia. Water Authority officers advise that it is not likely that approval would be granted for the physical transfer of water from this area to provide new lots in the study area with a water supply.

Owners currently make their own arrangements for water and, as is typical for rural residential developments, it is expected that this would continue to be the case for any further dwelling permitted on the peninsula.

Water supply for rural residential development is addressed in Section 6.2.

3.8 Climate

The peninsula enjoys a generally pleasant climate with mild wet winters and warm summers.

At Bremer Bay the mean rainfall is 627mm per annum, with on average, 117 rain days being experienced each year. Between the months May to October inclusive, 72% of the annual rainfall is experienced. Only 10% of the annual rainfall occurs between December and February inclusive.

The closest station recording wind and temperature information is at Mettler. The daily maximum temperature ranges between 16.1°C in July and 25.4°C in January (mean 20.6°C). The daily minimum temperature is between 6.2°C in June and July and 14°C in February (means 9.5°C).

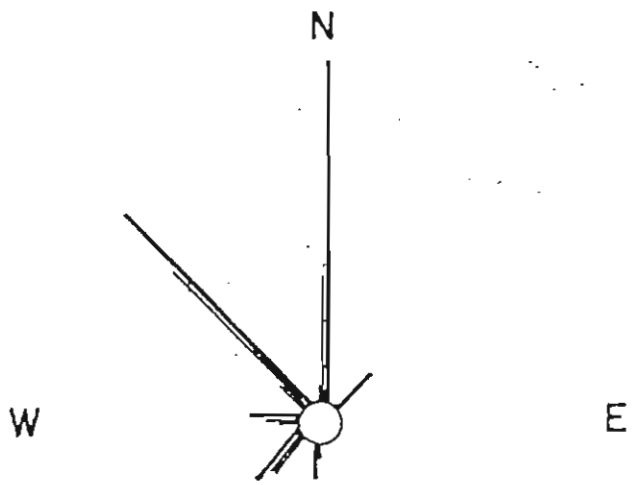
Information on the wind pattern prepared by R Oma (1986) is reproduced below.

> "The wind pattern shows major seasonal and daily variation (see diagram overleaf). In winter, winds are predominantly low to moderate speed, north-north westerlies in the mornings shifting to moderate speed, north-west to south-westerlies in the afternoon. In summer, winds are low-moderate speed, east-south westerlies (with a predominance of south easterlies), in the morning intensifying in the afternoon."

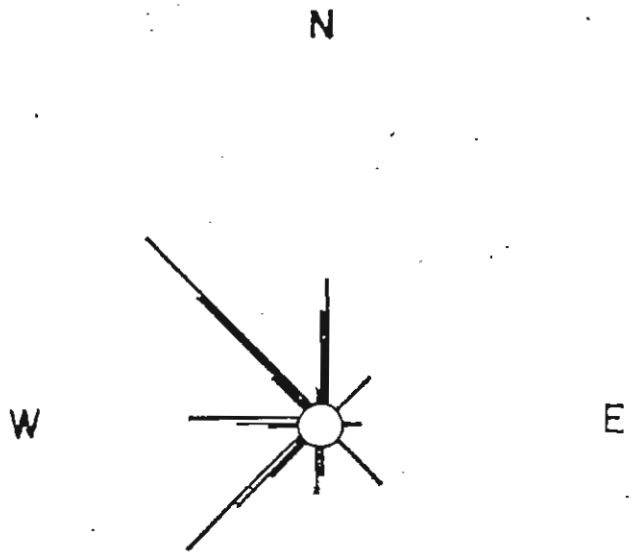
Local advice also confirms that the strongest winter winds are from the west, and the strongest summer winds tend to be easterlies. Protection for dwellings from winds coming from both these general directions is thus important, particularly closer to the coast where the winds are more keenly experienced.

Albany wind roses from the report by R. Oma (1986) are included below.

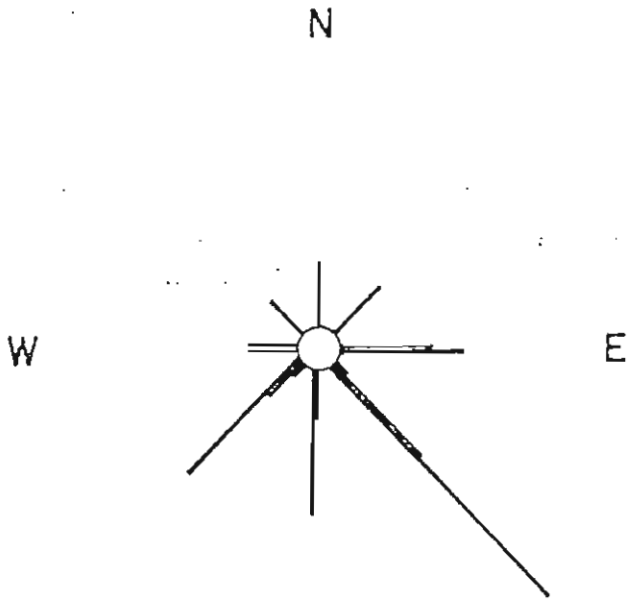
ALBANY WIND ROSES



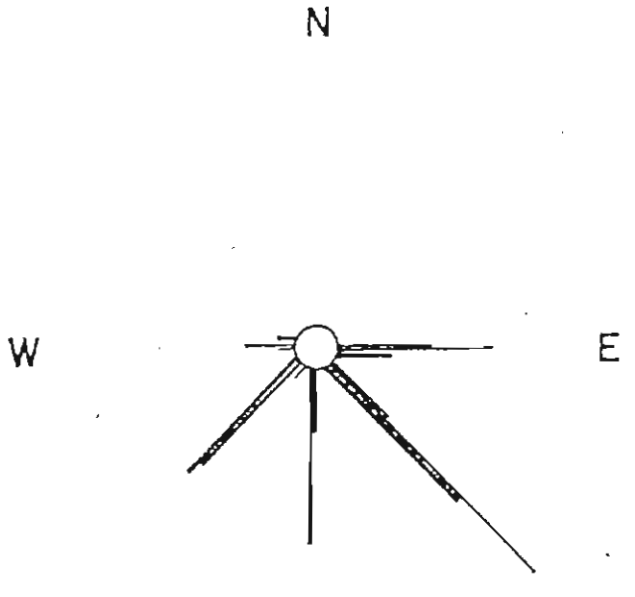
WINTER AM



WINTER PM



SUMMER AM



SUMMER PM

WIND SPEED

0 - 10 km/hr

11 - 30 km/hr

WIND FREQUENCY %

0 10 20 30

3.9 Fire Hazard

The cover of medium dense to short dense vegetation over the peninsula provides a supply of fuel for fires, and contributes to the current moderate to high fire hazard rating for the area. However, areas within a high fire hazard rating are limited to the steepest slopes, and the area has a good fire history in that fire outbreaks have not occurred since 1973.

Planning for bush fire protection is now a major requirement associated with rural residential development in fire prone areas.

Procedures to ensure proper fire safety measures are implemented have been developed by the Department of Planning and Urban Development in association with the Bushfires Board of W.A., and are outlined in the policy document entitled "Planning for Better Bush Fire Protection."

This policy requires detailed fire management plans to be prepared and implemented through the rezoning and subdivision approval phases. Fire management plans are required to address overall fire protection measures having regard for the ultimate development of the area, as well as detailed fire protection measures for specific stages of development.

Fire management plans prepared in association with rezonings are required to address:

- Strategic firebreak systems and maintenance.
- Access and maintenance of accessways.
- Water supply.
- Fuel reduction management
- Supply and maintenance of fire fighting services.
- Responsibilities for the above.

Implementation of the requirements of the plan is achieved principally through the subdivision approval process whereby action must be taken before clearances are signed by the appropriate authorities, prior to final endorsement of a plan of subdivision by the Department of Planning and Urban Development.

Preliminary plans of subdivision for parts of the study area have been discussed with the Bush Fires Board to ascertain the fire protection measures which are likely to be required.

The fire control measures under consideration as a result of those discussions include the following:

- Strategic fire breaks, as opposed to individual fire breaks.
- No fencing of boundaries.
- Adequately located roads to provide access for fire fighting vehicles and egress for residents in case of fire.
- Clearing within building envelopes to the Bush Fires Board recommendations (e.g. 20m of fuel reduced area to surround dwellings).
- Supply of water for fire fighting purposes in the north and the south of the study area. (Bore water is available in the northern part of the study area, and a permanent stream on Lot 2098 is capable of supplying a water tank at the southern end of the peninsula.)

The provision of the above measures will be required to have regard for both environmental and visual impacts. For example, slashing techniques, rather than bulldozing are preferred to minimise the susceptibility of fire breaks to erosion.

SECTION 4 : LAND CAPABILITY

4.1 Methodology

Land capability assessments have been undertaken to determine the parts of the peninsula which are capable of sustaining specified land uses without significant land degradation occurring.

A methodology has been prepared by the Department of Agriculture specifically for the purposes of Rural Strategies, and this methodology has been followed in this assessment.

The land capability assessment was undertaken by Mr John Ewing, engineer, in conjunction with Land Planning Consultants.

Mr Ewing undertook a site visit specifically for the purpose of the land capability study during June 1990.

4.2 The Land Use Assessed

The only land use which is under consideration on privately owned property is development in association with low density rural retreats. Thus the land capability study looks at the potential of the different land units on the peninsula to accommodate this use only.

Taking into account the perceived demand requirements for rural retreats in the area, and the objective to protect the environmental character of the area, the potential of each land unit to accommodate rural retreat development with the following characteristics is assessed in this section of the report:

- low density development;
- minimal clearing, limited to purposes associated with a residence, fire protection to the satisfaction of the Bush Fires Board, and access ways and services;
- on-site effluent disposal; and
- no keeping of animals, nor horticulture.

The study area is not required for, nor especially suitable for, agricultural purposes. Development of a node at urban densities is not considered appropriate on planning grounds. Bremer Bay is the existing appropriate focus for such development. Concentration of urban activity at the Bremer Bay townsite encourages more efficient use of the existing servicing infrastructure.

Recreational landuses are not proposed on private land. However, there is a commitment on the part of the appropriate authorities to developing the peninsula beaches for recreation purposes. In recent years, land has been reserved behind beaches, and roads are under construction to access the beaches. The matter of the development of the peninsula for recreational purposes has been addressed in studies by the Department of Conservation and Environment (The Jerramungup Coastal District Draft Management Plan), and is tackled by Council's Coastal Committee in conjunction with the Department of Planning and Urban Development's Coastal Planning Section.

Accordingly the land use assessed in this section is limited to rural retreats.

4.3 Land Qualities Assessed

The relevant land qualities which are required to be assessed for rural retreats (rural residential development) are as follows: ease of excavation, foundation stability, water logging hazard, water erosion hazard, wind erosion hazard, wave erosion hazard, flood hazard, soil absorption ability, water pollution hazard, soil salinity and bush fire hazard.

These were assessed, taking into account the relevant land characteristics specified in the Department of Agriculture's methodology, through on-site inspections, informal soil examinations, liaison with local people, and the stereoscopic study of aerial photographs.

4.4 Mapping Units

The land qualities above were assessed for each of the identified mapping units on the peninsula. Mapping units are defined as areas of land which display notable differences in land characteristics.

The selection of mapping units is complicated in the subject study area since the land is most variable and may contain a wide range in soil, local landform and vegetation types within, say, a 100 metre radius. However, having regard for the low intensity rural residential land use proposed, mapping units have been identified. These have been determined through:

- the overlay of maps showing the topography and drainage catchments, geology, soils, slope categories and vegetation communities;
- the consideration of erosion and climatic (wind) factors;

- o the stereoscopic study of colour aerial photographs;
- o a study of previous reports on the peninsula by K. Newbey (1987), and R. Oma (1986); and
- o field visits undertaken during 1990 by Mr J. Ewing, Ms M. Dawson and Dr A. Weston.

Figure 10 shows the mapping units identified on the peninsula.

A description of each mapping unit and assessment of the land qualities is included in Appendix 4.

4.5 Land Capability Summary

The overall capability of each mapping unit for low density rural-retreats is summarised in the table below.

The capability classes range from II to V, and have the following meanings in this particular capability analysis:

- II The mapping unit is capable of supporting a higher density of rural retreats, subject to management and development controls, compared with the other classes.
- III The mapping unit is moderately capable of supporting rural retreats, subject to management and development controls.
- IV The mapping unit is less capable of supporting rural retreats, and suitable sites for building envelopes are relatively scarce.
- V The mapping unit is not capable of supporting rural residential use.

The most suitable units from a land capability point of view were identified as units C and L, followed by units A, E and H.

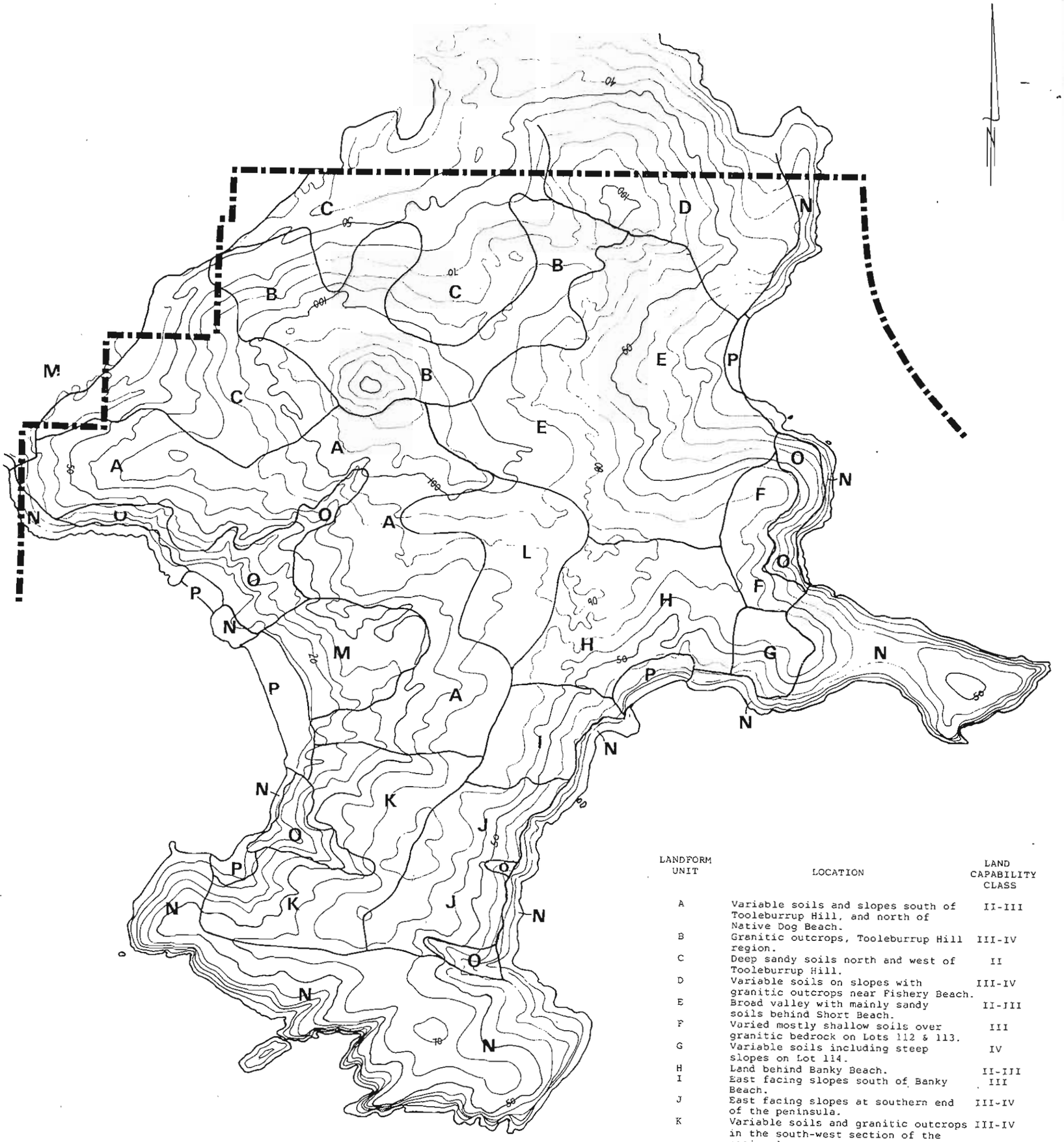
These are followed by units B, D, F, I, and then units K, J and G.

The mapping units with the lowest capability for supporting rural retreats are units M, N, O and P.

In determining what land is, in the final analysis, suitable for rural residential development, other factors also must be considered. These include the ease of servicing, demand, land owner willingness to subdivide, planning objectives, and landscape, heritage and amenity values. These factors are all reflected in the limited rural strategy proposals in Section 7.

LAND CAPABILITY SUMMARY TABLE

LAND UNIT CLASS	DEGREE OF LIMITATION FOR RURAL-RESIDENTIAL DEVELOPMENT	CAPABILITY
A	SLIGHT-MODERATE	II - III
B	MODERATE	III - IV
C	SLIGHT	II
D	MODERATE	III - IV
E	SLIGHT-MODERATE	II - III
F	MODERATE	III
G	HIGH	IV
H	SLIGHT-MODERATE	II - III
I	MODERATE	III
J	MODERATE	III - IV
K	MODERATE	III - IV
L	SLIGHT	II
M	VERY HIGH	V
N	VERY HIGH	V
O	VERY HIGH	V
P	VERY HIGH	V



LANDFORM UNIT	LOCATION	LAND CAPABILITY CLASS
A	Variable soils and slopes south of Tooleburrup Hill, and north of Native Dog Beach.	II-III
B	Granitic outcrops, Tooleburrup Hill region.	III-IV
C	Deep sandy soils north and west of Tooleburrup Hill.	II
D	Variable soils on slopes with granitic outcrops near Fishery Beach.	III-IV
E	Broad valley with mainly sandy soils behind Short Beach.	II-III
F	Varied mostly shallow soils over granitic bedrock on Lots 112 & 113.	III
G	Variable soils including steep slopes on Lot 114.	IV
H	Land behind Banky Beach.	II-III
I	East facing slopes south of Banky Beach.	III
J	East facing slopes at southern end of the peninsula.	III-IV
K	Variable soils and granitic outcrops in the south-west section of the peninsula.	III-IV
L	Generally deep sandy soils, densely vegetated, in the centre of the peninsula.	II
M	Blossoms Beach dune system, including a surrounding buffer.	V
N	Steep granitic coastal cliffs and adjoining granitic promontories.	V
O	Steep vegetated slopes not included in other units.	V
P	Beaches and immediate hinterland.	V

NB. See Appendix 4 for a description of each landform unit.

Figure 10

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LAND CAPABILITY MAPPING UNITS

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SECTION 5 : LANDSCAPE ASSESSMENT

Since the scenically attractive coastline is considered to be an important feature of the peninsula, aesthetic factors have been analysed in some detail, and influence the Limited Rural Strategy proposals.

These analyses address scenic quality and visually significant areas in order to establish priorities in landscape management.

The method of analyses undertaken are based on methodologies which have been developed by the Department of Conservation and Land Management.

5.1 Landscape Character Types

For visual resource management purposes, the State has been divided by the Department of Conservation and Land Management into Landscape Character Types ie areas with common distinguishing visual characteristics based upon landform and land cover patterns in vegetation, water and land use.

Within these Landscape Character Types, criteria to determine areas of high, medium and low scenic quality have been established.

In the study area, two Landscape Character Types have been identified - Coastline (the coastal perimeter of the study area), and Esperance Plain (previously known as Southern Slopes). These are described in Table 5.1 overleaf.

5.2 Scenic Quality

The Department of Conservation and Land Management has developed criteria for each level of scenic quality in the Coastline and Esperance Plain Landscape Character Units. The criteria are shown in the table below and are mapped in Figure 11.

The scenic quality classification differentiates the entire landscape into three levels of scenic quality based on the diversity, uniqueness, prominence and naturalism of landforms, vegetation and waterforms, and the degree of harmony of human activity with the natural landscape.

The areas of high scenic quality identified include the coastal perimeter, the Black Point and Point Henry headlands, all steep land and the highest area on the peninsula. The remainder is of moderate quality, except for the northern most part of the study area which displays little diversity.

The roads at this stage constitute land use elements of low to moderate scenic quality and the houses are of moderate scenic quality.

Areas of scenic quality are considered in conjunction with observed areas, to arrive at landscape management areas, at the end of Section 5.

TABLE 5.1 SCENIC QUALITY

LANDSCAPE CHARACTER TYPE	SCENIC QUALITY	LANDFORM	VEGETATION	WATERFORM	LANDUSE
Coastline	General Description	*Extends to landward limit of marine influences. *Includes long wind-swept beaches, quartzite cliffs rising 80m, extensive sand drifts (both consolidated and unconsolidated) and inlets.	*Low dense heath with very occasional patches of Melaleuca low woodland. *Mallee woodland associated with inlets.	*Inlets generally barred from the sea and associated riverlines often steep-sided	*Occasional site developments - low key day use and camping in carefully chosen locations only.
	High	*Cliffs and headlands. *All islands, stacks, off-shore sandbars and reefs. *Rock features, caves, faultlines, obviously banded sedimentary rocks. *Irregular coastline edges often emphasised by distinctive rock out-croppings, bays, inlets, and sand deposition patterns. *Primary dunes which display areas of active weathering, steep slopes and/or sand blown edges.	*Windshaped, gnarled or dwarfed vegetation unusual in form, colour and texture. *Single tree, shrubs or patches of vegetation which become focal points due to isolation or position in relation to rocks or water. *Strongly defined patterns of woodland, dune vegetation, Melaleuca scrub and/or barren rock.	*All estuaries, inlets, lakes and swamps. *Unusual ocean shoreline motion as eddies due to islands, reefs, surf zones and shoreline configuration.	*Human - imposed spot developments which are in harmony with naturally established forms, lines, colours and textures. *Harsh edge contrasts not evident.
	Moderate	*Expanses of beach of uniform width and colour without rock outcroppings or focal features. *Irregular coast edges without bays, inlets, promontories, stacks or cliffs.	*Predominantly heath or beach grasses with some variation in colour, texture or pattern. *Some contrast caused by different colours.	*Uniform ocean shoreline and motion characteristics with little diversity.	*Human-imposed spot developments in which form, line, colour and texture of introduced element borrow significantly from natural factors but some discordant visual impacts are clearly apparent. *Transition between landuses combining both gradual and abrupt edges, seldom appearing as an unbroken line.
	Low	*Expanses of uniform (indistinctly dissected) landform.	*Extensive areas of similar vegetation such as heath or beach grasses, with very limited variations in colour or texture.	*Water, where present, rates no lower than moderate in this LCT.	*Developments in which form, line, colour and texture of introduced elements contrast sharply with natural features. *Severly disturbed area with little natural vegetation. *Transition between land-uses sharp and geometric, generally appearing as a line.
Esperance Plain	General Description	*Rugged hills rising to 500m generally along the coastline. *Flat to undulating plain 80-300m in elevation, cut by steep-sided gorges.	*Scrub and low scrub of Banksia, Allocasuarina and Adenanthos on ranges. *Open to very open mallee on plain.	*Ranges: steep-sided short stream-lines only flowing after heavy downpours. *Plains: steep-sided gorges associated with major river-lines, V-shaped valleys in northern part, elsewhere swamps.	*Main developments are roads and tracks to the coast, fire breaks and limited number of walk trails.
	High	*Rugged hills and stony rises. *Expanses of bare rock warped and folded. *Steep-sided gorges.	*Areas of high plant diversity which display distinctive colour and textural patterns. *Packets of vegetation which become focal points due to isolation, unusal form, position in the landscape, or canopy variation. *Areas of colour which distinguish a plant group from its surroundings	*Ranges: Intermittent short steep streams which briefly flow following rain. *Plains: gorges with intermittent pools.	*Human-imposed spot development which are in harmony with naturally established forms, lines, colours and textures. *Harsh edge contrasts not evident.
	Moderate	*Flat to gently sloping areas with limited features of visual interest. *Rounded hills generally similar in gradient to surrounding landforms.	*Patterns evident in vegetation but lacking uniqueness or distinction relative to surrounding vegetation. *Transition from low ocean side vegetation to heath and mallees gradual.	*Seasonal swamps and occasional shallow creeklines.	*Human-imposed developments in which form, line, colour and texture of introduced elements borrow significantly from natural factors but some discordant visual impacts are clearly apparent. *Transition between landuses combining both gradual and abrupt edges seldom appearing as an unbroken line.
	Low	*Extensive flat areas with limited features of specific visual interest.	*Extensive areas of similar vegetation cover.	*Waterforms absent.	*Developments in which form, line, colour and texture of introduced elements contrast sharply with natural features. *Severly disturbed areas with little natural vegetation. *Transition between landuses sharp and geometric, appearing

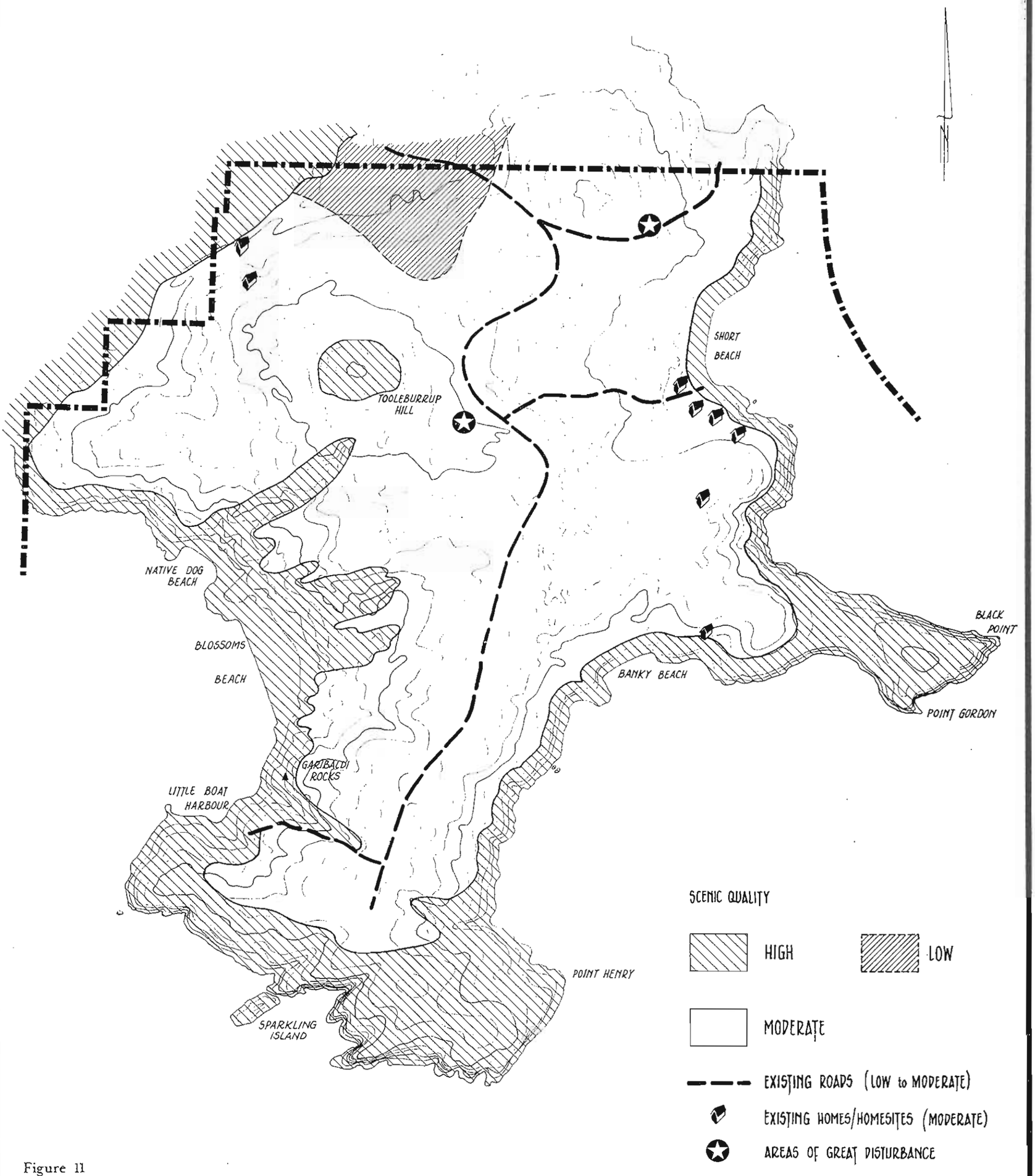

Figure 11

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SCENIC QUALITY

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5.3 Visually Significant Areas

Areas which are considered to require special attention to ensure that the visual quality of the peninsula is protected, are identified in this report as Optimal View Positions, Visual Focus Points, and Views from Roads. These are mapped in Figure 12.

Optimum View Positions, ie favourable positions from which to view substantial areas of high scenic quality, and elevated positions from which panoramic views are gained, are as follows:

- All beaches - It is considered that foreground views from Short Beach and Fishery Beach should contain few altered features, but glimpses of sympathetic development in the midground to background are acceptable. Introduced elements visible from Banky Beach, Native Dog Beach and Little Boat Harbour may be less acceptable.

- Tooleburrup Hill - It is considered that views of introduced elements in the foreground may not be acceptable. However, views of intermittent harmonious alterations in the midground to background are considered to be acceptable, and may add interest to the views.

- The northern and eastern headlands (Point Henry and Black Point headlands) - Again views of development in the foreground are considered to be unacceptable. Views of intermittent harmoniously designed introduced elements in the midground and background may add to the visual experience.

- Fisheries Beach Road, Short Beach Road and Little Boat Harbour Road - Views of the coastline are gained from these roads. Again it is considered that introduced elements in the foreground would detract from the visual experience, but more distant views of sympathetically designed introduced elements would be acceptable.

- The coastline generally - From numerous positions near the coastline, scenic views can be obtained. Low density development, and a generous setback of all development from the coastline, would protect the quality of views seen from the coastline.

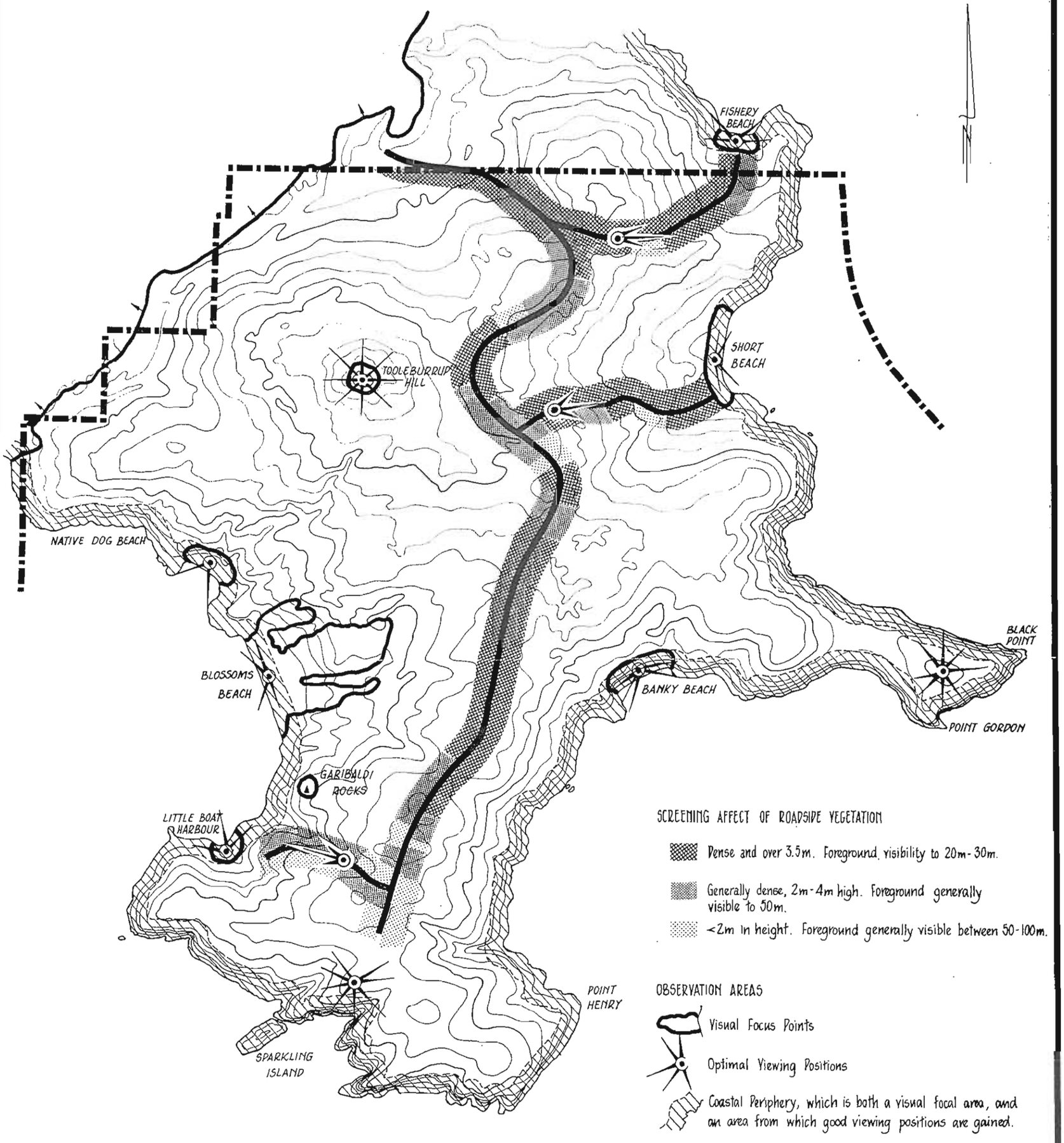

Figure 12

POINT HENRY PENINSULA

VISUAL IMPACT AREAS

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5.3.2 Visual Focus Points

Areas or features which are visual focus points due to their position in the landscape or unusual location, their scale or a combination of landform, landcover pattern or water, include the following:

- The dune system behind Blossoms Beach - To protect this focal area restrictions on clearing and the construction (or the visibility) of introduced elements in the vicinity of dunes are recommended.

- Garibaldi Rocks - (prominent granitic tors near the coast between Blossoms Beach and Little Boat Harbour) Restrictions on clearing and the construction (or visibility) of introduced elements in proximity to this feature are recommended.

- All beaches - (See notes on the Focus Points above)

- The coastline of the peninsula generally - (See notes on the Focus Points above)

- The distant coastline around Dillon Bay, Bremer Bay and Glasse Island

- Tooleburrup Hill - Since this hill is broadly rounded it is not a very significant feature in the landscape. However, it remains the highest point and restrictions on development or the visibility of development above 120m AHD are recommended. The top of the hill is within a reserve.

5.3.3 Views from Roads

The Department of Conservation and Land Management has developed a methodology for "Seen Area Mapping" requiring identification of areas seen from roads. However, since views from numerous other locations, not only roads, are also important on the peninsula, this method is of limited value for the purposes of this Strategy. Views from roads do remain of significance, nonetheless, and relevant aspects of views from the existing roads are outlined below:

- The main spine road - From this road generally views are limited to the dense roadside vegetation which is often over 4m - 6m in height in the northern part of the study area. However, in places wider views of the undulating landforms of the peninsula, or glimpses of ocean are obtained. In many places visibility extends only 20m or so. Generally, wider views are obtained from the southern end of the road where the vegetation is lower.

- Fishery Beach Road - While dense vegetation by the road in many places prevents the observer seeing more than 20m - 30m beside the road, wide midground views of the valley to the south and also more distant attractive views of the ocean (not the coastline), are obtained.

- Short Beach Road - Again the dense foreground vegetation restricts foreground views but does not inhibit some midground views of the adjoining valley and the ocean, and distant views of the far coastline, from being gained.

- Little Boat Harbour Road - Scenic views are gained of the adjoining incised valley, the coastline, and Dillon Bay in the background. Lower vegetation and the topography ensures that all alterations to the environment in the foreground on the north side of the road would be visible. Development on the southern side of the road, over the spur, however, could occur without being visible.

Figure 12 indicates the visibility of the foreground from the above roads.

The main spine road and roads to the beaches (including those yet to be built) will become increasingly used for recreational purposes by persons who seek to enjoy the natural environment around the coastal fringe. In recognition of this use, and the landscape character which will attract the potential rural residential population, it is recommended that foreground views should be protected through restrictions on clearing and the construction (or visibility) of introduced elements. Setback restrictions could vary to take into account the density and height of the vegetation beside the road, as well as topography.

It is considered that introduced elements in the midground and background are acceptable provided that they are intermittent, non-dominant, and are harmoniously designed.

5.4 Visual Alterations

Existing visual alterations on the peninsula comprise residential developments, roads, beach access areas, clearings associated with residences and some pits for road making materials. Most alterations are on a small scale and do not detract from the overall visual experience. In fact, the observation of houses and roads, when these are in the midground or background and are not dominant, adds variety and interest to the visual experience.

However, with future developments, great care should be taken with the positioning of pits and roads, and houses should be well set back from roads and the coastal fringe to protect visual amenity.

The visual privacy of rural retreat occupiers is considered important, and to achieve this it is recommended that envelopes are located so that neighbouring envelopes are not visible.

5.5 Landscape Management Areas

Superimposing the scenic quality map (Figure 11) with the observed areas map (Figure 12), areas of significance from a landscape management viewpoint, are identified. These are shown on Figure 13.

Future roads to the beaches are also taken into account in this assessment.

Proposed policies for these areas are outlined below:

TABLE 5.5

LANDSCAPE MANAGEMENT ZONE	LOCATION	VISUAL PROTECTION POLICIES
A Scenic Areas	Coastal periphery and Tooleburrup Hill	*Aesthetic considerations of high importance - visual protection controls to be imposed. *Alterations to environment to be generally inevident including roads, services, buildings and fire protection facilities) *Some minimally evident alterations for recreation purposes only. *Building colours to be harmonious with the surrounding environment and roofs to be of non-reflective materials.
B Main Peninsula Roads - Visual Protection Zone	Land adjoining main peninsula road, & roads to beaches.	*Aesthetic considerations important. Controls to protect foreground views along roads to be imposed. *Alterations to environment (for roads, fire breaks, services etc) to be minimal and to harmonise with the natural environment. *Building colours to be harmonious with the surrounding environment and roofs to be of non-reflective materials. *Residences on lots adjoining these roads are not to be evident from roads. *Generally the height of buildings will be limited to one storey unelss it can be shown that to build higher will not cause detrimental visual intrusion to the landscape.
C	Remainder of Peninsula	*Aesthetic considerations important especially in southern and eastern extremities of peninsula. Visual protection controls to he imposed. *Alterations to environment to be restricted to building envelopes, strategic fire breaks, accessways and services. Alterations for the purposes of roads and services to be minimal. All alterations to harmonise with the natural environment. *Building colours to he harmonious with the surrounding environment and roofs to be of non-reflective materials. *Residences not to be evident from the nearest roads, reserves, or other nearest residences. *Generally the height of buildings will be limited to one storey unelss it can be shown that to build higher will not cause detrimental visual intrusion to the landscape. *Setback of lots from the Coastal reserves shall have regard for visual and management implications.

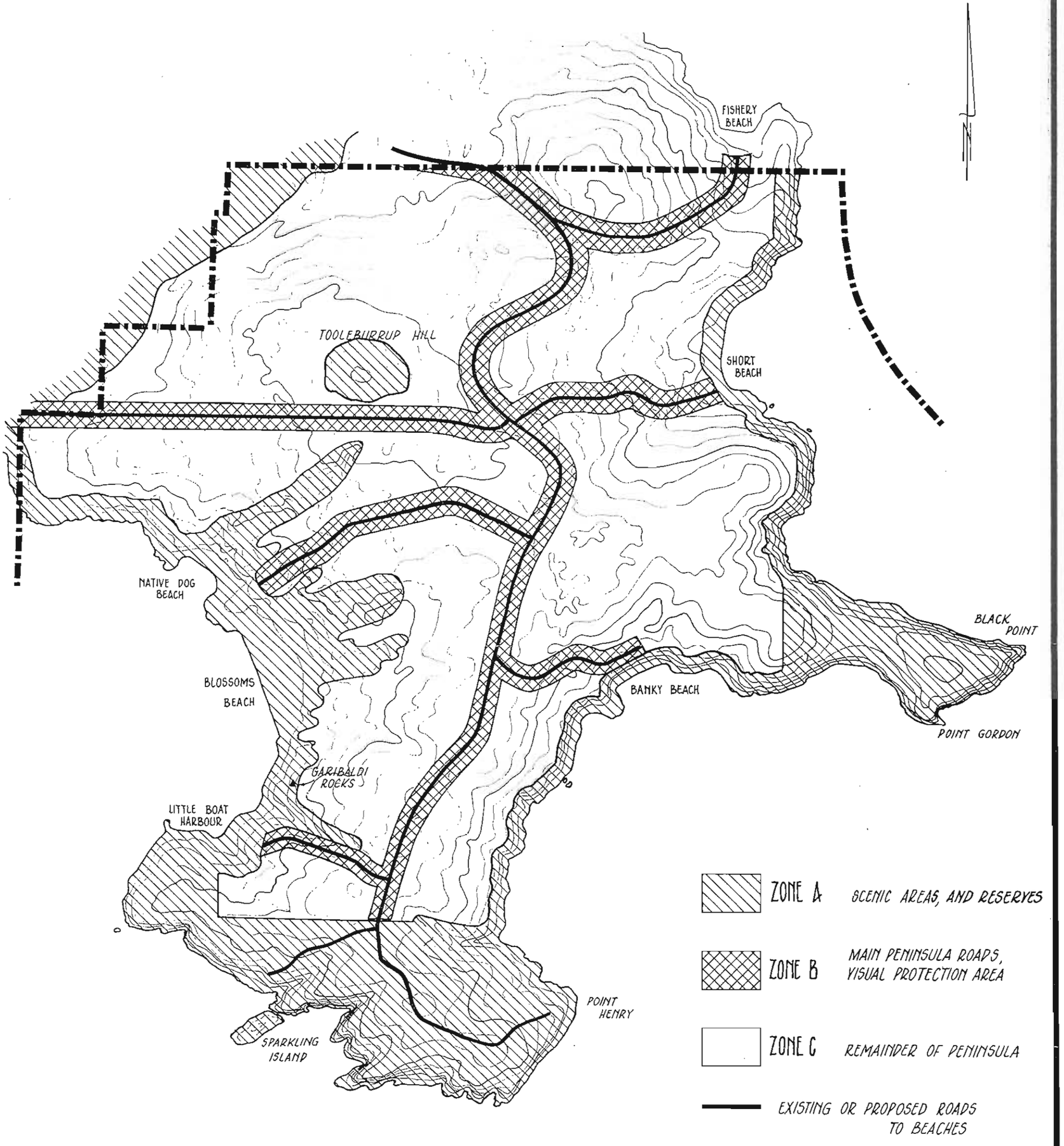

Figure 13

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LANDSCAPE MANAGEMENT ZONES

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SECTION 6 : SERVICES

This section contains an assessment of the existing availability of services, and addresses the provision of services expected in association with rural residential development.

The services addressed are roads, water supply, effluent disposal, drainage, SECWA and Telecom services, community requirements and employment.

6.1 Roads

For many years, the road reserves on the peninsula remained unconstructed. However, roads are now being constructed by the Main Roads Department in conjunction with Council to access the beaches on the peninsula. This will occur over a number of years as funds become available. Currently there is good access to Fishery Beach and Short Beach, and work is underway on the main spine road and the road to Little Boat Harbour.

At this stage only the road to Fishery Beach has been gazetted. The other roads have as yet not been finally surveyed, and are yet to be shown on titles. Closure of road reservations which are not required can also be expected.

Erosion of the incomplete roads is occurring and highlights the importance of satisfactorily completing sections of road, and addressing drainage, in a short time-frame.

The roads currently being constructed to access recreation locations provide a network of roads over the peninsula.

It is envisaged that additional roads would be required to serve rural residential development, and would be constructed to the standards specified by Council. These need to be carefully located to minimise the potential for erosion, and to have minimal visual impact.

The engineering consultant for the project, Mr John Ewing, advises that:

> "Roads can be constructed throughout the area using materials on site for sub base. Base course material is available within reasonable distance. Earthworks will not be expensive and drainage can be achieved. Certain areas, in swales, will need to be set aside for drainage purposes."

6.2 Water Supply

There are few known permanent water sources on the peninsula which could provide water for rural residential purposes. However, in common with accepted and general Special Rural practice, it is expected that any rural residential development would rely on rainwater, supplemented by other supplies where available. There may be variable supplies of bore water available in some parts of the study area. Natural soaks provide water at several locations on the peninsula.

The Water Authority of Western Australia has advised that the subject area is outside the proclaimed Bremer Bay Groundwater Area. Within this groundwater extraction area, which adjoins the northern boundary of the subject land, the extraction of groundwater is required to be licensed. The Water Authority advises that development on the peninsula should expect to be independent of the

Bremer Bay supply, since there are concerns about the adequacy of the fresh water supply for the growing Bremer Bay townsite.

The Water Authority of Western Australia also currently has reservations about making water extracted from the proclaimed Groundwater Area available to lots within the study area.

Mr John Ewing, the engineering consultant for the project, has prepared a report for determining tank capacity requirements taking into account the roof area and local rainfall. This can be supplied by Land Planning Consultants if required.

A 92,000 litre water storage tank, the standard requirement in many Special Rural zones, will generally adequately supply over 400 litres per day.

A water supply for fire fighting purposes could be provided for the southern part of the study area by the permanent creek in Lot 2098. A supply for the northern part of the study area could be provided by bore water.

6.3 Effluent Disposal

On site effluent disposal is proposed.

Several alternative methods of effluent disposal are available and approved by the Health Department of Western Australia.

The type of system permitted is subject to approval by the Shire of Jerramungup, and will depend on the size of the residence served and ground conditions (slope and soil type).

Alternative systems include septic tanks and soak wells, septic tanks and leach or evaporation drains, and biocycle systems. Council officers are satisfied that appropriate systems exist for the varied peninsula soil types.

Special restrictive effluent disposal criteria are not considered justified given that a relatively low density of rural residential development is proposed, the study area is not within a proclaimed groundwater or public water supply area, and there are no permanent wetlands or waterways in the rural residential precincts.

6.4 Drainage

Runoff will result from the construction of dwellings, other buildings, paved areas and access ways.

Since only a low density of development is envisaged, drainage resulting from the development of lots, can and will be, satisfactorily accommodated on-site. The location of accessways on lots should be subject to approval, to ensure that erosion will be prevented.

The consultant engineer for the project, Mr J.O. Ewing advises that drainage areas associated with roads will be required.

6.5 SECWA and Telecom Services

Local SECWA and Telecom officers advise that the existing infrastructure is capable of being extended to serve the peninsula.

SECWA reticulation currently extends into the northern part of the study area, and the Jerramungup office is liaising with landowners to determine the route of a line to serve the eastern properties.

Radio telephone services are provided to the residences on the eastern side of the peninsula. However, further development would justify a conventional underground service.

6.6 Community Facilities

Since Bremer Bay, 3.5km from the northern boundary of the study area, is the only township within a 100 km radius, all basic community services are provided.

The town has a service station and general store which also provides post office facilities. There is a caravan park with a kiosk, a hotel and motel, a church, craft shop, library and primary school.

A second caravan park, which also will provide kiosk facilities, is under construction adjoining the northern boundary of the study area.

Recreational facilities include a golf course, tennis courts and bowling green.

The Education Department advises that the existing school would provide for children from the peninsula. It is recognised that many peninsula properties would be occupied for holidays only and that the average generation of primary school children per lot would be less than average. Jerramungup provides a District High School for children up to Year 10, while Albany, 180 kilometres away, would provide for students after Year 10. There is a hostel at Albany for boarders.

Visits to the town are made by health care professionals, on a regular basis.

A municipal rubbish tip is located between the study area and Bremer Bay.

Accordingly, residents on the peninsula would not have to make excessively long trips to benefit from a range of services and facilities.

As Bremer Bay has shown a relatively rapid rate of growth over the past few years, and is likely to increase in popularity as the Point Henry peninsula beaches are opened up, a greater number of services will no doubt be provided over the next few years.

6.7 Employment

Although Bremer Bay is a small community, it is growing, and an increase in employment opportunities will result. The main potential for growth appears to be in the fields of tourism and services to residents. However, there is also potential for the fishing industry to expand, especially if the Fishery Beach project proceeds. Current employment opportunities include contract services to the agricultural district, building trades, fish processing, some manufacturing and service industry, retailing and personal services.

Since many properties on the peninsula are likely to be sought after for holiday purposes, or prove attractive for retirement, the supply of employment opportunities is not a critical factor.

In this section it has been shown that services adequate to meet the expectations of a rural residential population can be satisfactorily provided.

SECTION 7 : THE LIMITED RURAL STRATEGY - POLICY AREAS AND DEVELOPMENT GUIDELINES

7.1 Planning Precincts

This section of the Rural Strategy identifies areas which are considered suitable for different densities of rural retreat land use taking into account the socio-economic factors identified in Section 2, the physical characteristics of the peninsula and land capability considerations (Sections 3 and 4), the landscape assessment (Section 5) and servicing considerations (Section 6).

The three following planning precincts have been determined:

- Recreation and Environmental Protection
- Rural Residential
- Restricted Rural

The characteristics of these precincts and the proposed land use and management controls for each are outlined in Section 7.2 below. Figure 14 identifies the proposed precincts.

The application of stringent landscape and environmental protection controls is considered of prime importance in each precinct, having regard for the objectives to provide opportunities for rural residential living in a scenically attractive environment, and to increase recreational use of the coastline.

7.2 Precinct Policies and Implementation Strategies

7.2.1. Recreation and Environmental Protection Precinct

This precinct covers the following categories of land:

- Landscape Management Zone A (land of high scenic quality)
- Land capability units M,N,O, and P of capability class V (land not generally capable of supporting rural residential land use).
- Existing reserved land and land that is proposed for recreation purposes under the Jerramungup Coastal Management Plan.
- Land south of Little Boat Harbour, land in the south eastern portion of the Peninsula, and land generally north of the road to Fishery Beach as shown on Figure 14.

Policy Statements

- In these areas protection of the natural environment is the prime objective.
- For recreational uses of various types and fire protection purposes, only, some restricted clearing and minimal development may occur.

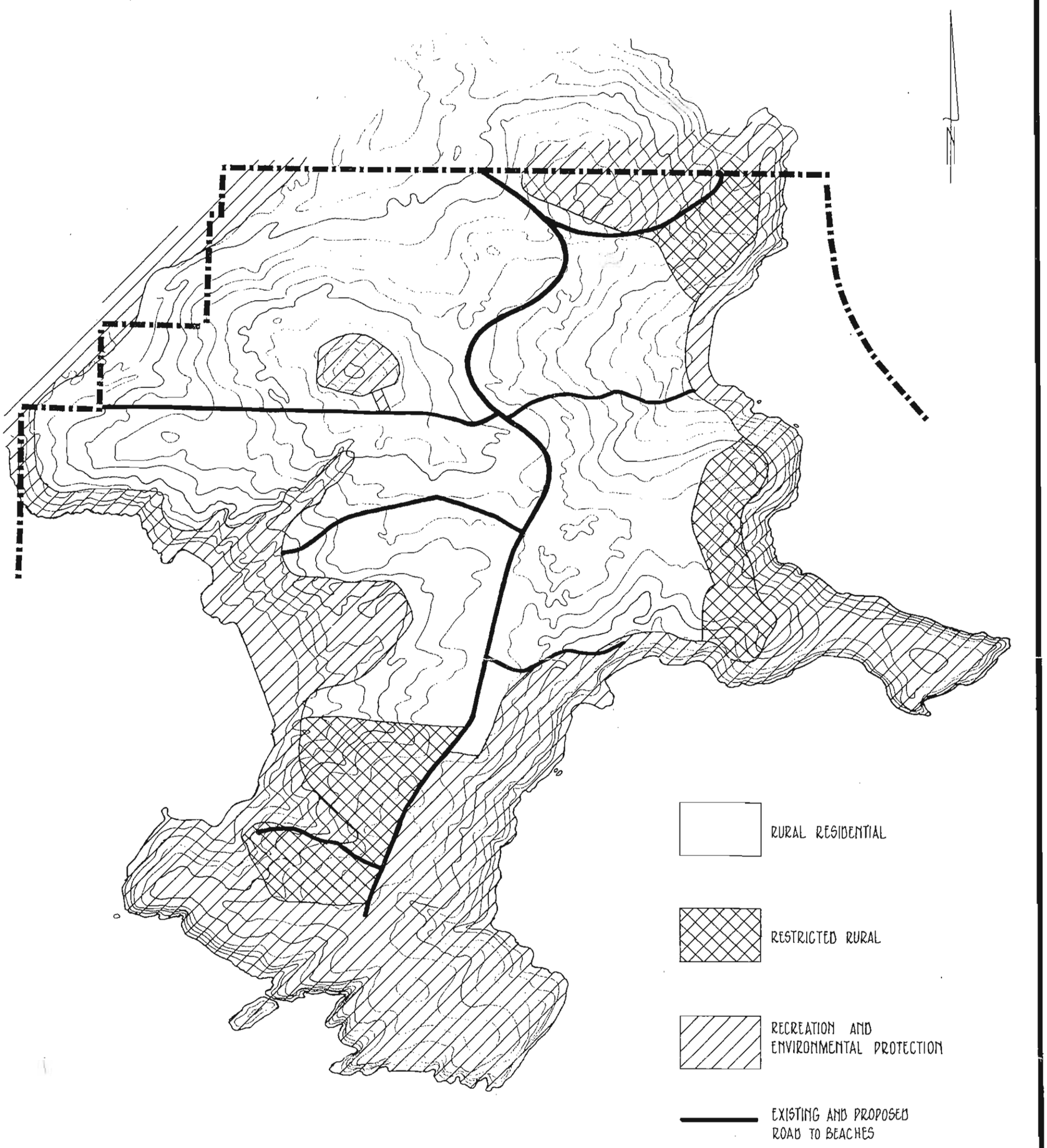

Figure 14

POINT HENRY PENINSULA

LIMITED RURAL STRATEGY PLANNING PRECINCTS

614 Newcastle Street,
LEEDERVILLE 6007.

Telephone(09)227 5899
Facsmile (09) 227 5862

LAND PLANNING CONSULTANTS
Incorporating G.R.Crimp & Partners

SCALE: 1:25,000 REF. Nº: 1156/90.03
DATE: JULY 1991 DRAWN: D.A.S.B.

Implementation of Policy Statements

- Specific Coastal Management Plans and Reserve Management Plans shall be prepared for each section of this precinct. The Department of Planning and Urban Development's Coastal Section, in conjunction with Council, is currently involved in such planning.

- This precinct shall generally be reserved land, with the exception of minor areas which are subject to landscape protection controls under private ownership. No development shall be permitted in this precinct unless it is in accordance with an approved Management Plan.

- Implementation shall have regard for the recommendations of the Jerramungup Coastal Management Plan and all planning statements relating to the coastal area. Implementation of proposals envisaged by Council and the Department of Planning and Urban Development shall be the responsibility of the appropriate authorities.

- Management Plans shall address the management issues identified in Section 2.8.3 of this report.

7.2.2 Rural Residential Precinct

This precinct includes land capability mapping units with a capability classification of I, II and III i.e. units which have a high to moderate overall rating for low intensity rural retreat development.

The land capability mapping units in this precinct comprise units A, B, C, E, H, part I and L. Land of high scenic quality is excluded.

The lot sizes suggested for these units under the sub-heading in this section "Implementation of Policy Statements" are based on preliminary on-site investigations to determine the optimal locations for dwellings. The optimal locations for dwellings are where slopes are less than 6%, soils are deep and suitable for effluent disposal and building, there is protection from easterlies and westerlies, and the dwelling site is not prominent from the Optimal View Positions (see page 43) or adjacent dwelling sites.

The suggested lot sizes are based on average characteristics for the land capability unit. However, as pointed out in previous sections of this report, the peninsula has a very diverse nature. Different lot density criteria for parts of these units may be considered should the detailed on-site investigations undertaken in conjunction with rezoning applications reveal, to the satisfaction of the authorities, that this is warranted.

Owners of land in the north west corner of this precinct have indicated that their preference, at this stage, is to retain their properties in large holdings. Subdivision in this portion of the precinct thus appears unlikely, at least in the foreseeable future.

Policy Statements

- This land is identified as being suitable for low density rural residential development.
- Subject to owner willingness to subdivide, this land may be rezoned and developed from the time of approval of the Limited Rural Strategy.
- Should an owner not wish to subdivide then the Restricted Rural rezoning option shall be available (see Section 7.2.3).
- Visual and environmental protection are significant objectives for this precinct.
- Foreground views along the main roads and roads to beaches shall be protected.

Implementation of Policy Statements

- Concept and subdivision guide plans shall be prepared in association with rezoning to Special Rural or similar type zoning. Subdivision guide plans shall indicate the location of building envelopes on all lots. Building envelopes, which are to be selected by on-site analysis, shall be required to satisfy criteria with respect to slope, soils (depth and suitability for effluent disposal), wind protection, soil conservation and visual prominence.
- The setback of lots from the coastal reserve shall take into account both visual and management factors.
- Lot density controls shall be included in rezonings. Subject to further investigations, the minimum lot size in land capability units C and L shall be 2ha with a minimum average lot size of 3ha. The minimum lot size in land capability units A, B, E, I and H shall be 3ha, with a minimum average lot size of 4ha.
- Land use to be restricted under rezoning to Single Residential, and the keeping of stock to be prohibited.
- Subdivision roads and fire services shall be provided to the standard required by the relevant authorities.
- Environmental, fire, heritage, and visual protection controls shall be included in rezoning provisions. Visual protection policies are specified in Table 5.5. Clearing controls shall apply to land outside building envelopes.
- Visual protection controls shall apply to the roads, as shown on Figure 13, to protect foreground views.
- Rezoning provisions and subdivision approvals shall address the management issues identified in Section 2.8.3.

7.2.3 Restricted Rural Precinct

In the Restricted Rural precinct, visual and environmental protection are important objectives.

In this precinct, the onus is on the proponent/owner to establish to the satisfaction of the relevant government authorities that subdivision and hence development would not cause detrimental impact, in terms of land capability and visual intrusion. Unless this can be achieved applications for rezonings to permit low density Rural Residential development will not be considered.

This precinct includes land capability mapping units part D, F, G, part I, J, and part K, with land capability ratings generally between III and IV.

Where the proponent can show to the satisfaction of the authorities that defined areas can support rural residential, then a rezoning to accommodate this development may occur, and the implementation criteria listed in Section 7.2.2 shall apply.

It is envisaged that owners of land in this precinct will be encouraged to retain large holdings through the operation of rating incentives.

Currently, the owners of rural residential holdings on the peninsula feel that the present rural rating levy is inappropriate. This matter was addressed in Section 2.8.1.

It is not considered necessary or desirable to impose a very high rates burden on owners who do not wish to subdivide or who cannot subdivide, especially if the subdivision of adjoining properties is resulting in the generation of more rates.

While the peninsula is capable of supporting rural retreats at various densities, it is not the intention of the Strategy to induce landowners to seek approval to subdivide, to overcome high rating levels.

The option for landowners to seek rezoning from Rural to a Restricted Rural type zoning, if accompanied by rating incentives, could be the way to achieve not only higher environmental standards on large holdings, but also, a rating level more consistent with other rural residential properties in the State.

Policy Statements

- Protection of views and the environment are significant objectives for this precinct.
- Owners of holdings with subdivision potential under this Strategy shall be encouraged to seek rezoning to a Restricted Rural type zoning.
- The onus shall be on the proponent/owner to establish to the satisfaction of the relevant government authorities that subdivision would not cause detrimental impact in terms of land capability and visual intrusion, before rezoning and subdivision for low density rural residential purposes shall be considered.

- Land within the Restricted Rural Zone shall be subject to landuse, environmental and landscape protection controls. Land rezoned to Restricted Rural shall not be subdivided for a minimum of 5 years. The potential for rezoning and subdivision after this time is subject to review of the Rural Strategy, which should occur as part of the 5 yearly review of Council's Town Planning Scheme.

Implementation of Policy Statements

- Land in this precinct may be rezoned to Restricted Rural, or, subject to the satisfaction of the relevant authorities, to a zone permitting low density rural residential development.

- Land use, development, visual and environmental protection controls shall be included in Restricted Rural rezonings (or rezonings with similar intent). Table 5.5 specifies visual protection policies.

- Rezonings permitting low density rural retreats shall comply with the Implementation Criteria in Section 7.2.2 above.

- A review of rates for properties zoned Restricted Rural in the Limited Rural Strategy Study Area shall be undertaken.

7.3 Release of Land for Special Rural Purposes

While a sufficient demand to require the rezoning of land for Special Rural purposes has been established, predictions on the number of lots which can be absorbed by the market can only be rough estimates at this stage.

This is particularly so because no comparable land is for sale in the general region.

Albany real estate agents, however, who deal with the sale of rural residential land in the region estimate that in the current climate 20-30 lots per annum may be absorbed by the market. The rate of lot sales will of course reflect the prices being asked for lots, and the relative attraction of the stage of land being released. Expectations are that the demand will escalate in 2-3 years as the prices of comparable land closer to Perth increase, and cyclical market conditions improve.

Non-contiguous development of land on the peninsula is not expected to be associated with any particular difficulties, provided that the normal situation prevails whereby the developer pays for subdivision costs.

It is not expected that the peninsula will be developed to the maximum extent possible under this Limited Rural Strategy, especially in view of the availability of Restricted Rural rezoning.

However, the maximum generation of lots has been determined, as tabled below, for the purposes of estimating the upper limits of the demand for services.

Planning Precinct	Gross Precinct Area	Lot Density (based on gross precinct area)	Maximum Lot Generation
Rural Residential	929 ha	1 lot/3.5 ha in land capability units C and L 1 lot/4.5 ha in land capability units A, B,I and H	215 lots
Restricted Rural*	141 ha	say 1 lot/10 ha	14 lots

* Calculations of lot generation in this table are based on the assumption that lots are rezoned to Rural Residential (or similar zone).

On the basis that 20-40 lots may be absorbed each year, it is estimated that the peninsula has the potential to meet the demand for rural residential lots for 8 years.

A sufficient number of rezonings should be permitted to proceed to satisfy the expected demand for at least 2-3 years supply of lots. However, after the initial rezonings are approved it is considered appropriate that the rate of processing of further rezoning proposals be considered in the light of the conditions which prevail at the time.

7.4 Conclusion

As required by the brief, this Limited Rural Strategy for the Point Henry Peninsula identifies areas suitable for rural residential (Special Rural) development.

The Strategy identifies three precincts, as follows:

- The Recreation and Environmental Protection Precinct - no rural residential development permitted.
- The Rural Residential Precinct - rural residential development permitted subject to rezoning controls.
- The Restricted Rural Precinct - retention of large holdings encouraged. Rezonings to accommodate rural residential development may be permitted if the owner/proponent can satisfy the authorities that subdivision would not cause detrimental impact, in terms of land capability and visual intrusion.

A Restricted Rural zoning is proposed for landowners who wish to retain large land holdings primarily as rural retreats. A number of owners have indicated that their preference is to retain large holdings. The Restricted Rural zoning is expected to be associated with rating incentives to ensure that the currently high rural rating levels do not unduly influence owners to subdivide.

Regardless of whether rural residential development proceeds on the peninsula, significant changes will occur, as increasing numbers of recreational visitors are attracted to the peninsula in consequence of the current road construction and beach development programmes. It is considered that an increased level of rural residential development can satisfactorily accompany these changes, provided that stringent land use, environmental and visual protection controls apply to each precinct, in accordance with the policies and implementation guidelines outlined in Section 7.

APPENDIX 1 - STUDY BRIEF

App 1

SHIRE OF JERRAMUNGUP

ENDORSED LIMITED RURAL STRATEGY BRIEF

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Fax : (09) 227 5862

March, 1990

Our Ref : 1156.010

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1.0 GENERAL

The Shire of Jerramungup proposes to undertake a Limited Rural Strategy, to identify land suitable for special rural subdivision to meet demand within the next 2-3 years.

It is proposed the study be conducted by G.R. Crimp and Partners in close liaison with Council, and authorised officers nominated by the Council. The "Guidelines" produced by the Department of Planning and Urban Development in 1989 have generally been adhered to in the following Brief Proposal.

2.0 BACKGROUND INFORMATION

Council's proposed new District Planning Scheme (Town Planning Scheme No. 1) has been advertised and Council is considering the submissions.

That Scheme contains three Scheme Policies. One of these Policies refers to possible future growth of the Bremer Bay townsite and suggests an area for possible Special Rural Zoning. That area is to the south of the townsite and extends onto a peninsula known as Point Henry.

The choice of portion of Point Henry as a possible Special Rural area goes back to 1986. In early 1987 Council requested preliminary comments from the State Planning Commission on a proposal to subdivide Kent Location 206.

Bearing in mind the location of the Shire, it is considered the only area where Special Rural Zoning may be appropriate is at the scenic coastal location of Point Henry. It has become apparent to the landowner of Location 206, by numerous enquiries that there is a demand for lots of a Special Rural nature.

In mid 1986, the State Planning Commission advised all local authorities that as it was re-evaluating its various rural policies, it was not prepared to process any further special rural proposals until such time as an interim document was released. The State Planning Commission released its Rural Land Use Planning Policy in 1989.

This Limited Rural Strategy will assess the suitability of the development of not only Kent Location 206 but generally the area to the south of the Bremer Bay townsite as a whole.

3.0 STUDY OUTLINE

3.1 Objectives

To have in place a limited strategy for the creation of a special rural zone within the Shire of Jerramungup that will:

A. Define areas within the area from the southern boundary of the Bremer Bay townsite to the B Class Reserve 3766 of the south point of Point Henry which are considered suitable for special rural land use.

B. Give direction and guidance to Council and developers with regard to the creation of the special rural zone.

C. To ensure that the areas selected are located within a landform which is not in a natural hazard area with constraints to development such as steep slopes, blowouts, wind exposure and fire hazards and capable of sustaining a more intense form of land use activity without detriment to important landscape features both visual and the general landscape amenity, availability of prime agricultural land, the management cost of adjoining landowners and the adjoining reserved lands; and

D. Satisfy consumer demand for the next 2-3 years after the finalisation of the limited strategy.

3.2 Study Area

It is proposed that the area to be examined comprises and is limited to the area identified on the attached map.

4.0 PRELIMINARY STUDIES

The consultant will be required to produce an assessment of the major physical, economic and social characteristics of the study area and a brief assessment of demand for special rural subdivision. These assessments are to be orientated towards collecting data required to select suitable land for subdivision for the type of special rural development identified in the demand analysis.

4.1 Economic

It is intended to examine the economic base of the subject area, and the relevance of economic activities within that area to the district generally. It is proposed to draw statistics held by the Australian Bureau of Statistics and various other government bodies. In so doing, the following aspects are to be dealt with:

A. The importance of agriculture to the district, and the identification of marginal areas;

B. The potential and implications of the developing tourist industry within the area;

C. The economic impact of the special rural zone on the rating base of the Shire; and

D. The cost to the Shire of maintaining existing rural zones such as management and servicing costs (including the control of dogs, fire control, etc.).

It is expected that information pertaining to the latter issues be derived primarily from the Shire of Jerramungup.

4.2 Social

The Study will also address issues relating to perceptual implications of special rural zone development, such as:

A. The visual impact of the special rural area (refer also to 4.4);

B. The impact of possibly altering population characteristics within the particular locality (this is also to include an appraisal of public attitudes towards the special rural zones through liaison with groups such as the professional fishermen and the Bremer Bay Progress Association;

C. The impact of the special rural zone on the provision of services such as education; and

D. The identification of land use conflicts (such as proximity to existing industrial areas, tourist routes and roads, and productive agricultural areas).

E. The maintenance of the cultural heritage of the area.

4.3 Demand Analysis

The consultant will attempt to ascertain the types of special rural zone lots which are in demand. The analysis should look at hobby farms, rural retreats, stable complexes, intensive agriculture and any other categories that are appropriate.

The demand analysis should include:

.. General land use survey of the locality;

.. Discussion with local real estate agents and valuers;

.. Discussion with Council officers; and

.. Examination of subdivision and development applications over all rural land in the local authority.

The demand analysis will provide the primary selection criteria for special rural development such as:

.. Range of land use;

.. Lot sizes;

.. Importance of aesthetic factors; and

.. Services required eg.,

- water requirements
- bus services
- rubbish services
- standards of road construction.

The demand analysis will also provide an estimate of the number of lots required for development to meet demand over the next 2-3 years.

4.4 Physical

The consultant will undertake a general assessment of the major physical characteristics of the Study Area including the following factors:

.. Topography;

.. Vegetation;

.. Soils;

.. Major landscape features eg. rivers;

.. Existing land uses eg. location of major transport routes, Crown reserves, townsites, various rural land uses;

.. Major planning proposals eg. proposals for the new Shire of Jerramungup Town Planning Scheme No. 1 and the proposed System 3 Conservation Reserve Report by the EPA;

.. Identification of mining leases within the study area and the constraints imposed by areas already mined;

.. Identification of Archaeological sites within the study area;

.. Availability of water for domestic and stock purposes;

.. Management implications in locating more intensive development next to conservation areas;

.. Identification of catchments to all major water bodies and the potential effects of nutrient input associated with landuse changes. Highly phosphorous leaching soils in these catchments should be identified;

.. Flood risk and flood plain management;

.. Fire hazard assessment; and

.. The impact of subdivision on further growth of urban areas of Bremer Bay is to be examined.

5.0 PRELIMINARY EXCLUSION OF UNSUITABLE LAND

A preliminary assessment of material presented in section 4.0 should be undertaken to exclude obviously unsuitable areas from more detailed analysis.

Such areas may include:

.. Land required for future urban development or land affected by other relevant planning or environmental considerations;

.. Prime agricultural land;

.. Conservation areas;

.. Land which is obviously unsuitable for more intensive development eg., high fire hazard risk, exposed to winds, steep slopes, blowouts, proclaimed water catchment, irrigation, drainage areas, land subject to inundation high flood risk, high risk of nutrient input to adjacent water bodies, land affected by proposed, existing or past mining activities;

.. Existing land uses incompatible with proposed land use and associated buffers eg. noxious industries

.. Existing land uses of significance to the local economy eg. agricultural or tourist use;

.. Land remote from service centres which would not be economic to service. The consultant is to establish maximum distances from service centres and outlying areas should be excluded along with tourist routes and areas of outstanding beauty which are not considered suitable for more intensive development;

.. Land with unreasonably high management cost (eg. fire control, etc.); and

.. Land with high landscape value.

6.0 AREA SELECTION

Following the above exclusion process, smaller areas will be identified as being suitable for final assessment to select land to meet study objectives.

This assessment should take place in three stages:

i) The determination of specific selection criteria for each land use identified in the demand assessment eg. land use, water requirements, aesthetic requirements, service needs.

ii) Land capability analysis.

iii) Socio-economic analysis.

The first two stages shall be undertaken in conjunction with the Department of Agriculture. That Department is to be contacted before and during the assessment procedure.

The assessment shall include:

.. A clear statement of the types of land use (including agricultural uses) being considered within the special rural zone;

.. A statement of the land/soil conditions which must be satisfied if given land uses are to be feasible eg. soils, water logging, salinity; and

.. A clear demonstration that the areas ultimately chosen for particular land uses meet the land/soil conditions required above.

Once land has been identified which is capable of supporting the range of land uses required, socio-economic factors can be introduced to select special rural policy areas and to meet demand over the study period. At this level, socio-economic issues may include factors such as the following:

.. Ease and costs of management;

.. Ease and cost of servicing;

.. Landowner willingness to subdivide;

.. Staging for subdivision and development; and

.. Landscape analysis.

Policy statements are to be prepared regarding future development and management of each area selected.

Policy statements will include issues such as:

.. Need for a concept or overall plan or subdivision guide plan for the whole policy area prior to or in conjunction with zoning;

.. Fire management;

.. Land uses;

.. Service requirements and standards;

.. Lot sizes; and

.. Environmental protection.

7.0 ADMINISTRATION

During the course of the study the consultant will liaise with the following:

.. Water Authority of WA;

.. Department of Agriculture;

.. Mines Department;

.. Department of Planning and Urban Development;

.. Environmental Protection Authority;

.. Department of Conservation and Land Management;

.. Great Southern Development Authority;

.. State Energy Commission;

.. Bush Fires Board;

.. Health Department;

.. Jerramungup Land Conservation District Committee;

.. W.A. Museum (Dept of Aboriginal Sites); and

.. any other agencies considered necessary.

The Consultant shall attend meetings as required and shall present and explain the report and proposals to Council.

A report is to be prepared which includes:

.. Background analysis;

.. Strategy maps showing major features and location of selected policy areas; and

.. Policy statements regarding the ongoing management of the area.

All resource data used in the assessment should be attached as an appendix. references used and agencies contacted (with officers names) should also be listed.

Upon endorsement of the report by Council, it will be forwarded to the Department of Planning and Urban Development for adoption. Ten copies of the report should be made available to the Department of Planning and Urban Development for circulation to referral authorities. Photocopies with maps which are difficult or impossible to interpret are not acceptable.

APPENDIX 2 - CONTACTS AND REFERENCES

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CONTACTS

Authorities and Individuals contacted during the preparation of the Point Henry Limited Rural Strategy include the following:

Authorities

Agriculture, Department of	- Tom Sweeney and Jill Lissen (Jerramungup office) - Roni Oma (Rural Strategy Advisory Committee)
Bush Fires Board	- Mr Greg McKay (Regional Manager)
Conservation and Land Management, Department of.	- Kelly Gillen (District Manager) - Mr Richard Hammond, landscape architect
Environmental Protection Authority	- Gabby Corbett, Gary Wissen
Great Southern Development Authority	- Mark Staniford
Jerramungup, Shire of	- Frank Pecska (Shire Clerk) - Mark Chester (Deputy Shire Clerk at the time). - Simon Fraser (Building Dept.)
Land Administration, Department of	- Central Map Agency
Marine and Harbours, Department of	- Mr R. Brindley and Philip Bray
Mines, Department of	- Hydrogeology Section

Main Roads Department	- Albany office
Planning and Urban Development, Department of	- Peter Duncan and James Dorn (Albany office). - Stephanie Clegg (Coastal Planning Section, Perth office).
South West Tourism Association	- Mark Exeter
State Energy Commission of W.A.	- John Usher, Jerramungup
W.A. Museum, Dept. of Aboriginal Sites	- Mr Nic Green and Liz Bloor
W.A. Tourism Commission	- Valerie Noy (Research Division, Perth).
Water Authority of Western Australia	- Bob Sillifant (Regional Manager), Clive Mariano (District Engineer)

Real Estate Agents

The Professionals
- Watson and Capararo (Albany)

Nationwide Realty Roy Weston (Albany)

Landowners

Mr W.M. Wellstead
Rev. K. Broadbent
Mr T. Carruthers
Mr R. Davies
Mr J. Wellstead
Mr E.A. Gooch
Mr B. Robinson
Mr & Mrs L. and S. Milgraum C/- Mark Majzner
Mr K. Reddington

Consultants

Mr John Ewing - Engineer
Mr Arthur Weston - Botanist

APPENDIX 3

NATIVE VEGETATION AND SIGNIFICANT FLORA ON POINT HENRY PENINSULA, BREMER BAY

By Dr. A.S. Weston

APPENDIX 3

NATIVE VEGETATION AND SIGNIFICANT FLORA ON POINT HENRY PENINSULA BREMER BAY

By

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SEPTEMBER 1990

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FIGURE

APPENDIX

1.0 INTRODUCTION

This report presents the results of a botanical survey of Point Henry Peninsula, the land between Bremer Bay and Dillon Bay, undertaken between July 19 and 22, 1990 and on October 14, 1990. It includes a map and discussion based upon the survey and upon stereo-interpretation of 1:20,000 scale colour aerial photographs flown in January 1987, reference to other aerial photography, relevant articles and reports, examination of Western Australian Herbarium collections and discussions with botanists. The report, and the survey upon which it is based, is intended to supplement and clarify vegetation and flora aspects of reports and land classifications by Oma (1986), Newbey (1987a, 1987b) and Ewing (1988, 1990).

The Point Henry Peninsula referred to in this report is an area of approximately 2,500 ha due south of Bremer Bay and includes Point Gordon, Black Point and Point Henry and all of the land south of the east-west boundary south of Fishery Beach and west to the enclave of Fitzgerald River National Park.

During the July botanial survey, the native vegetation of the peninsula was photographed and described at selected representative sites which cover the range of vegetation found there. The photographs are available for reference but are not included in this report.

2.0 VEGETATION

2.1 Regional Vegetation

Beard (1976) maps the native vegetation potential (i.e. what native vegetation would be there if it had not been cleared) of the region that includes the Point Henry peninsula at a scale of 1:250,000. He also maps it a scale of 1:1,000,000 (Beard 1980). Both maps are accompanied by explanatory texts. On both maps the native vegetation potential of the Point Henry Peninsula is shown as being scrub or low scrub on granite in the Bremer vegetation system, but the text (Beard 1979) describes it as "an intricate mosaic of plant communities" in the littoral fringe of the coastal plain between Pallinup River and Hood Point.

According to the text, the intricate mosaic includes the following vegetation elements:

- groves of *Agonis flexuosa* on sand in low-lying and sheltered sites,
- thickets of *Dryandra sessilis* and other shrubs on exposed ridges of sand and limestone,
- bare rock and low, domed shrubs of a variety of species, including *Acacia cyclops, Dryandra pteridifolia* and *Banksia dryandroides,* on granite summits and pavements,
- larger domed shrubs of species of *Banksia, Darwinia, Melaleuca* and *Acacia* in sheltered areas on granite,
- a sequence of communities on coastal sandhills and limestone dominated by species including *Scaevola crassifolia, Westringia dampieri, Agonis flexuosa* mallee, *Eucalyptus angulosa, Acacia cyclops,* other species of *Acacia*, and
- mallee of *Eucalyptus decipiens* and mixed heath on long-weathered, leached soils inland of the coastal dune.

The first four elements are well-represented on Point Henry Peninsula, the fifth is less well-represented, and the last is absent.

2.2 Vegetation of Point Henry Peninsula

In general, Beard's descriptions of the plant communities in the intricate mosaic between Wellstead Inlet and Point Gordon fit the principal vegetation communities observed during the July, 1990 field work on the peninsula. Essentially, these principal communities are:

- mallee shrublands, low woodlands and low forests to 15 m tall dominated by peppermint (*Agonis flexuosa*) and *Acacia cyclops*, chiefly on sandy, sheltered soils,
- *Eucalyptus angulosa* mallee thickets, on a few limestone ridges slopes and gullies,
- mixed heaths, often characterised by *Dryandra pteridifolia* and other domed shrubs on granite uplands, by *Hakea trifurcata* on the northeastern granite point, by *Dryandra sessilis* on upland limestone soils and by *Phebalium rude* and *Spyridium globulosum* on steep coastal slopes,
- thickets of *Melaleuca pentagona, Melaleuca lanceolata* and *Melaleuca* sp., and
- coastal vegetation of established aliens and native grasses, sedges and small shrubs.

These principal vegetation communities and other, more restricted communities were sampled during the July field work at representative and particular sites, where plants were collected and later identified to genus and, in most cases, species. A list of species was compiled for each site, and, based upon the lists, aerial photo interpretation and other observations, Newbey's land unit classification and vegetation descriptions were extended.

The distribution of the land units, cleared land and major vegetation types are shown in Figure 1, and the vegetation of the units is described below.

2.2.1 Vegetation Descriptions

Major vegetation types and the symbols used for them on the land unit and vegetation map are:

P *Agonis flexuosa* low woodland and low forest (3 m to 8 m tall)
commonly with *Hakea oleifolia, Acacia cyclops, Hibbertia cuneiformis, Spyridium globulosum, Rhagodia* sp., *Acacia* sp., *Leucopogon revolutus, Leucopogon ? australis, Phyllanthus calycinus, Chorizema ilicifolia, Kennedia prostrata, Hardenbergia comptoniana, Sollya heterophylla, Stylidium adnatum, Patersonia ? occidentalis, Isolepis nodosa, Lepidosperma* spp., *?Schoenus* sp., *?Tetraria octandra, Loxocarya ? flexuosa, Poa* sp., *Dichondra repens, Oxalis corniculata* and a variety of orchids including *Pterostylis* spp., *Acianthus reniformis* and *Corybas ? despectens;* prominent established alien species include *Asparagus asparagoides, Dipogon lignosus* (Dolichos Pea), *Lycium ferocissimum* and *Leptospermum laevigatum;* some other native species that are common in heath vegetation are also common in the understorey, at least locally

E *Eucalyptus angulosa* mallee (3 m to 6 m tall)
moderately dense mallee with a patchy, generally sparse shrub understorey, generally of *Leucopogon* sp., and a dense herbaceous layer principally of *Loxocarya ? flexuosa, Lepidosperma ? costale* and *Opercularia hispidula*

M *Melaleuca lanceolata* and *Melaleuca* sp. thicket (2 m to 6 m tall)
typically dense and with few other shrubby or understorey species

H Heath (0.5 m to 3 m tall)
typically with a mixture of dominants and with mixtures of species which vary with substrate (limestone, granite, sand and heavier substrates), exposure and, probably, burning history; this vegetation type comprises the majority of species of perennial plants on the peninsula

C Clearing and partial clearing
pasture grasses and legumes and a variety of established alien weeds, in some cases with scattered shrubs and patches of native vegetation, with buildings and with roads and tracks

The land units shown on the land unit and vegetation map and their vegetation types and corresponding Newbey land units are:

1. Beaches and Sandy Shores (Newbey: 1 Beach)
generally zoned, low, herbaceous vegetation comprising *Euphorbia paralias, Cakile maritima, Arctotheca populifolia, Tetragonia decumbens, Isolepis nodosa, Sporobolus virginicus, Spinifex hirsutus,* other, less common or typical species, and, near springs, *Samolus repens* and *Lobelia alata*

2. Steep Coastal Granitic Slopes (Newbey: 2 Coastal Granite Slope)
generally bare of vegetation, but sometimes seepage herbaceous plants and stunted shrubby vegetation as at Point Black (see description under Land Unit 8A)

3. Coastal Limestone Flats (Newbey: 3 Coastal Limestone Flat)
a heath, often under 1 m tall and patchy or sparse, of *Spyridium globulosum, Acacia cyclops* (with relatively small, thick leaf), *Scaevola crassifolia, Olax phyllanthi, Leucopogon ? parviflorus, Pimelea ferruginea, Leucopogon* sp., *Acacia littorea, Westringia dampieri* and *Carpobrotus* sp.

4. Coastal Dunes, largely unvegetated (Newbey: 4 Dunes, in part)

5. Foredunes, generally vegetated (Newbey: 5 Foredune)
commonly dense, 0.5 m to 2 m tall, zoned shrubby and succulent vegetation which includes *Scaevola crassifolia, Pimelea ferruginea, Olearia axillaris, Calocephalus brownii, Atriplex ? isatidea, Lepidosperma ? gladiatum, Myoporum* sp., *Carpobrotus ? virescens* and *Westringia dampieri*

5A. Vegetated Interior Dunes and Sandy Slopes
mainly the *Agonis flexuosa* communities described under 'P' above, merging into heaths and shrubby vegetation of *Dryandra sessilis*, *Lepidosperma* spp., *Acacia* spp. and *Spyridium globulosum*; the heaths are typically 1m to 2 m tall but, especially where the *Dryandra* and the *Spyridium* are not dominant, are shorter and more open and have a prominent ground layer of sedges and sedge-like plants

6. Granitic Gullies (Newbey: 6 Granite Gully)
typically, there is a dense growth of *Lepidosperma* species, *Baumea* species and other sedge and sedge-like plants 0.5 m to 1 m tall, often with a dense, 2m to 5 m tall overstorey of *Acacia cyclops* or *Melaleuca ? cuticularis* shrubs or small trees

7. Granitic Outcrops (Newbey: 7 Granite Outcrop)
mosaics of bare rock, dense shrubs and small shrub-herbaceous plant communities, often with *Borya nitida* and other resurrection plants

8. Granitic Plains (not No. 9 or No. 7) (Newbey: 8 Granite Plain)
variable, generally proteaceous heaths and taller, shrubby *Acacia* communities; the dome-shaped heaths of Point Henry are characterised by *Darwinia diosmifolia* and *Dryandra pteridifolia* and other proteaceous species; Land Unit 8 on the northeastern point is characterised by a thick, short-leafed form of *Hakea trifurcata*; the granitic plains inland between Blossoms Beach and Little Boat Harbour have conspicuous open areas of established alien grasses and other herbaceous plants, remnants of pasture vegetation

8A. Granitic Slopes
variable heaths and shrubby vegetation generally similar to those of Land Unit 8; the granitic slopes inland between Blossoms Beach and Little Boat Harbour, like the plains, have conspicuous open areas of established alien grasses and other herbaceous plants, remnants of pasture vegetation; granitic slopes at Point Black on the margin between Land Units 6 and 8A have the following species, in vegetation to 1.5 m tall: *Melaleuca cuticularis, Rhagodia* sp., *Calocephalus brownii, Eutaxia obovata, Westringia ridida, Enchylaena tomentosa, Disphyma crassifolium, Carpobrotus ? virescens, Gahnia trifida, Isolepis nodosa, Lobelia alata* and *Sporobolus virginicus.*

9. Limestone Flats (Newbey: 9 Limestone Flat)
heath vegetation, commonly between 0.5 m and 2.5 m tall and with *Dryandra sessilis, Hakea ruscifolia, Hakea ? varia,Spyridium globulosum, Banksia vilocea, Leucopogon* spp., *Acrotriche ? pluriloculari*s, *Lepidosperma* spp.and restionaceous sedges

9A. Limestone/Sandy Slopes
Eucalyptus angulosa mallee and a variety of heaths, including ones characterised by *Dryandra sessilis* and *?Oxylobium* sp. and the same as those described for Land Unit 9

10. Limestone Gullies (Newbey: 10 Limestone Gully)
Eucalyptus angulosa mallee as described above, in Vegetation Type E, is typical on the western side of the peninsula

11. Limestone Ridges (Newbey: 11 Limestone Ridge)
typically *Dryandra sessilis* mixed heath as described for Land Unit 9

11A. Steep Coastal Limestone (Newbey: Steep Coastal Limestone 12 Facing SE & 13 Not facing SE)
dense mixed heath 0.5 m to over 1.5 m tall with *Scaevola crassifolia, Phebalium rude, Westringia rigida, Acacia littorea, Acacia cyclops, ?Thomasia* sp., *Spyridium globulosum, Templetonia retusa, Leucopogon obovatus, Leucopogon ? parviflorus, Hibbertia cuneiformis, Oxylobium* sp., *Olax phyllanthi, Olearia axillaris, Clematis pubescens, Rhagodia* sp., *Platysace compressa, Muehlenbeckia adpressa, Sollya heterophylla, Pimelea ? ferruginea, Lepidosperma ? gladiatum, Lepidosperma ? costale, Adriana quadripartita, Zygophyllum* sp., *Isolepis nodosa* and *Carpobrotus ? virescens*

2.2.2 Vegetation Map

Figure 1 shows the distribution of vegetation as major communities and in terms of the land units defined in Section 2.2.1. The major communities are indicated by the letters C, H, E, M, P, and the land units are indicated by the numbers 1 through 11A.

Because the vegetation of the peninsula is generally an intricate mosaic of communities, particularly on the central uplands, two or three units are in some places mapped as one land unit (and vegetation) complex, e.g. "9,11". Also, in a few places, particularly where there has been clearing, a unit is mapped with a dashed line around it to indicate it is a blend and mosaic of the mapped unit with the neighbouring unit.

2.3 History and Condition of Vegetation

Max Wellstead's ancestors were the original European settlers of the Point Henry Peninsula, over a hundred years ago. According to Max, his forebears cleared large parts of the peninsula by chaining (by pulling swamp yate, *Eucalyptus occidentalis*, logs across the ground with horses) and burning and began running sheep on the property in the early 1880s. Alien grasses, including kikuyu grass (*Pennisetum clandestinum*), were planted in some, but not all, cleared areas.

Prior to the stock being taken off the peninsula in 1972 the vegetation of the freehold land on the peninsula was burnt on a three-year rotation, approximately a third of the vegetation at a time. The last set of rotational burning was in 1969, 1970 and 1971. Since then a strip was burnt about five years ago in the Garibaldi Rock area, between Blossoms Beach and Little Boat Harbour, as a fire break. Another long strip was burnt three years ago across limestone ridges and sand valleys in the Short Beach area.

The current native vegetation on the peninsula's freehold land began, grew and spread since the rotational burning stopped and stock were taken off the property in the early 1970s. This vegetation is now, with few exceptions, dense and at a mature or close to mature height. The exceptions are clearings near houses and other buildings, and granitic soils in Land Units 8 and 8A which are still covered alien grasses and other herbaceous plants. Where undisturbed by fire or grading this vegetation is now stable and protects its underlying soil from erosion.

In general, the native vegetation, particularly that dominated by peppermint, paperbarks and other non-proteaceous plants, appears to be in good condition. Some of the heath vegetation dominated by proteaceous plants, particularly by *Dryandra pteridifolia* and on Point Henry Peninsula, strictly speaking, many of the shrubs are dead and dying.

3. FLORA

Although a detailed description or listing of the flora of the Point Henry Peninsula is not encompassed by this report, many of the species identified during the July survey are referred to in the vegetation descriptions. In addition, an informal species list is being prepared.

4.0 SIGNIFICANT PLANT SPECIES

4.1 Background

The significant species searched for during the botanical survey of Point Henry Peninsula are those on two sets of unpublished lists, plus others highlighted during discussions with Western Australian Wildlife Research Centre (WAWRC) botanists and in Ken Newbey's reports. The term 'significant species' is defined and discussed in the appendix to this report. The two lists are:

- Gazetted Endangered Rare Flora (Government Gazette, WA, of 1 June 1990), and
- Priority One, Two and Three Species on the Reserve Species List for the South Coast Region (SVL 13/9/89).

Endangered Flora (DRF) species within the ranges of which Point Henry Peninsula may lie are:

Acacia simulans
Adenanthos dobagii
Corybas sp. (Albany) (74.) L. Byrne 10
Verticordia helichrysantha
Verticordia sp. (Fitzgerald R.)

Point Henry Peninsula does not appear to lie within the range of any Priority One species. Priority Two and Three species within the ranges of which Point Henry Peninsula may lie are:

Priority 2
Acacia aff. *myrtifolia*
Anthocercis fasciculata
Astroloma sp.
Conospermum lancolata
Dampiera deltoidea
D. fitzgeraldii
Eriostemon cymbiformis
Eucalyptus x kalganensis
Gastrolobium heterophyllum
Gonoarpus trichostachyus
Grevillea fistulosa

Priority 3
Acacia robinae
A. aff. *sulcata*
Calycopeplus marginatus
Gastrolobium racemosum
G. stenophyllum
Melaleuca citrina
Villarsia lasiosperma
Xanthosia peduncularis

4.2 Significant Plant Species found on Point Henry Peninsula

No DRF species or likely habitats for most of them were found on the peninsula, and no other significant species were identified during the July survey or among the July survey collections currently being identified.

A species of *Corybas* orchid that was found in bud at the time of the survey and in full shade beneath peppermints on consolidated, inland sand dunes. This is the right habitat for DRF species "74, *Corybas* sp. (Albany) L. Byrne 10" (Hopper *et al.* 1990). However, the location and the August flowering time of the Point Henry Peninsula *Corybas* orchid are right for the wide-spread coastal species *Corybas despectens* (Hoffman and Brown 1984) but not for the undescribed DRF species.

No declared rare flora (DRF) species was found on the peninsula. It is not impossible, however, that a DRF orchid or other significant species does occur there. It is possible that at least one Priority species or other significant species was missed, although the botanical survey done was reasonably thorough and representative for a winter survey.

5.0 ACKNOWLEDGEMENTS

Botanists employed by the Department of Conservation and Land Management and Max Wellstead have provided advice, information and other assistance with the project.

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FIGURE

App 3

APPENDIX

GAZETTED, PRIORITY AND SIGNIFICANT SPECIES

Arthur S. Weston, Ph.D. (Botany)

In 1975, Western Australia's Fauna Conservation Act was retitled as the Wildlife Conservation Act, and in 1979 the Act was amended to provide protection for specified species of flora as well as of fauna. The first plant species to be declared by the Minister as protected rare flora under the Act were listed in the Government Gazette, WA, of 14 November 1980. Periodically the Minister publishes notices in the Government Gazette deleting and adding species to the list of protected flora. During the time a species, or other taxon, is gazetted as protected no-one is allowed to "gather, pluck, cut, pull up, destroy, dig up, remove or injure" a plant belonging to a wild population of that species without special written consent of the Minister (Rye and Hopper 1981; Hopper *et al.* 1990). Fines may be imposed for breaching provisions of the Act.

The first list of gazetted flora comprises 100 species, including a variety of one of the species. The current list, printed in the Government Gazette, WA, of 1 June 1990, comprises 247 species. Some of the species first gazetted in 1980 are absent from the current list, presumably because they have been found to be more abundant or wide-ranging than previously indicated by collections and records or because they appear to be well-protected in nature reserves and national parks.

In some cases a species is still on the list but under a different name. One example is the orchid *Drakaea jeanensis*, now listed as *Drakaea elastica*.

In general, species are gazetted or declared as rare flora (DRF) not only because they are rare (i.e. because fewer than a few thousand reproductively mature plants of the species are known to exist in the wild) or geographically restricted but also because their continued, long-term survival in the wild is believed to be threatened.

Gazetted rare species, also known as declared rare flora or Endangered Flora (see Hopper *et al.* 1990), are not the only Western Australian plants that are rare, geographically restricted, threatened or vulnerable. In fact, they probably constitute only a small proportion of such species. For example, Marchant and Keighery (1979) listed more than 2,000 species that were rare or poorly collected or were geographically restricted to a range of less than 160 kilometres.

This report discusses such species, particularly ones that are gazetted as declared rare flora (DRF) or are on the Reserve Flora list, which have been recorded in the Metropolitan Region.

1. Published Lists of Rare, Restricted and Poorly Collected Species

Australia-wide treatments of rare, geographically restricted and endangered species by Specht, Roe and Boughton (1974), Hartley and Leigh (1979), Leigh, Briggs and Hartley (1981) and Briggs and Leigh (1988) also contain Western Australian lists, which are based upon publications or other information provided by botanists in the various states. They cover presumably rare or threatened plants but do not deal with the adequacy of collection of any species.

Extinct and Endangered Plants of Australia, by Leigh, Boden and Briggs (1984), lists endangered and presumably extinct species and presumed threats to the continued survival of endangered species. The book also describes and illustrates many endangered and extinct species, discusses the inconsistent use of terms to indicate various degrees of threat and rarity, and describes the binary system developed by Hartley and Leigh (1979) to classify rare, restricted and threatened species.

The first Western Australian publication on rare and restricted flora, by Marchant and Keighery (1979), is based upon the numbers of specimens of each native Western Australian species lodged in the Western Australian Herbarium and the geographical range of the collections for each species. Marchant and Keighery classify most of their 2,022 listed species as geographically restricted, presumably rare or poorly collected.

Five reports dealing with rare, restricted and threatened species have been published by the Department of Fisheries and Wildlife. One, by Rye (1982), lists geographically restricted southwestern plants, and another, by Rye, Hopper and Watson (1980), is concerned with the distribution and conservation status of commercially exploited native plants. The first two lists of gazetted rare Western Australian flora are presented and the listed species are described and illustrated in Rye and Hopper (1981) and Patrick and Hopper (1982).

The species on the 1989 list of declared rare flora are listed, described and illustrated, generally with

colour photographs, in Hopper *et al.*(1990). Hopper *et al.* also list Reserve Flora and describe and illustrate a selection of presumed extinct Western Australian plants.

2. 'Significant' Species

The term 'significant species' as used in this report refers to species that are:

- rare, geographically restricted or apparently rare or restricted because they are poorly collected or recorded,
- at the limits of their ranges or in areas outside their normal ranges or habitats,
- particularly susceptible or vulnerable to environmental changes, especially ones caused by humans, either directly or indirectly,
- diminishing significantly in abundance or geographical range due to clearing and other environmental changes associated with agriculture, mining, recreation, urbanisation and provision of services, or
- poorly represented in secure conservation reserves.

The term 'significant' is used in this report instead of 'vulnerable', 'threatened', 'depleted' or 'endangered' because these terms either are too limited in their scope or implications or, as Leigh, Boden and Briggs (1984) put it, "have become highly emotive through popular usage, making it difficult to develop objective criteria for use in ascribing species to various categories". Leigh, Boden and Briggs and Hopper *et al.* (1990) discuss appropriate teminology in more detail.

All of the species in the lists referred to in Section 1 are significant species. Some significant species are gazetted as rare species; most are not.

The completeness and accuracy of most lists of significant Western Australian species are limited by the fact that they do not contain varieties, subspecies or undescribed species, some of which are also rare, and in that the intensity, uniformity and seasonal coverage of collecting and systematic surveying have been insufficient to distinguish between genuinely rare (and restricted) species and species which only appear to be rare (or restricted) because they have been poorly collected. Systematic surveying and collecting by Western Australian Wildlife Research Centre (WAWRC) botanists, and others, are correcting this deficiency.

In some cases, significant species are found in areas where they were not previously known to occur. For instance, *Villarsia submersa*, a small water-lily type plant, was believed to be restricted to a few small seasonal ponds between Bunbury and Busselton until recent years, when it was found near Denmark, west of Manjimup and, in 1989, in a few ponds in the Metropolitan Region. *Synaphea pinnata* is a plant species previously gazetted as rare (Government Gazette, WA, of 14 November 1980) which has since been found to be more common or widespread or better conserved than previously believed and is no longer gazetted.

In other cases, species are no longer found in areas where they have been previously recorded, often due to habitat destruction or alteration. However, there are are many species which emerge and flower for only one or a few years after fire, then disappear until after the next burn. For example, at least one population of the gazetted orchid *Drakaea elastica* recorded in the Metropolitan Area a few years ago has not been found recently.

Other sources of incompleteness and ambiguity in distribution and abundance information are:

- insufficient locality information given on the labels which accompany herbarium specimens,
- inaccurate identification of specimens, and
- treatment of groups of species as single species.

So little is known about the abundance, distribution and taxonomy of nonvascular plants that few such species are gazetted as rare flora or are included in lists of significant species, although many of them may also be rare or geographically restricted.

3. Gazetted Endangered Flora Species (DRF)

The first list of declared rare flora, gazetted in 1980, was based upon assessment of the Marchant and

Keighery (1979) list, addition of newly described species and local botanists' knowledge of species distributions and abundance. Gazettal of a species is now generally preceded by relatively detailed searches made in the field to locate populations of the species proposed as rare.

The list of gazetted flora does not include all, or probably even a majority of, rare species. The current list (1 June 1990) concentrates on the southwestern part of Western Australia and particular groups of species, which have, in general, been studied in greater detail than others. For example, members of the families Proteaceae, Myrtaceae, Leguminosae and Orchidaceae account for more than 150, well over half, of the gazetted species on the current list. It is likely that in the southwest alone there are many more ungazetted rare and restricted species than gazetted ones.

The two lists of gazetted rare flora in Rye and Hopper (1981) and Patrick and Hopper (1982) comprise fewer than 150 species, and the 1990 list contains fewer than 250 species, probably only a small proportion of Western Australian plants that could be considered as rare. Another list, in Rye (1982), contains 527 species of southern Western Australian flowering plants that are geographically restricted and includes most, if not all, of the species gazetted at that time as rare. The Rye list is based upon investigation of collections upon which the Marchant and Keighery (1979) list was based, taxonomic publications and rare plant records of the WAWRC.

Since the early 1980s WAWRC botanists have been compiling lists, descriptions, illustrations and records of significant species on a regional basis throughout Western Australia. The lists were originally compiled from herbarium records of the species listed in Rye (1982) and Marchant and Keighery (1979) and from taxonomic literature. These lists and records, along with relevant taxonomic studies, provide the basis for the lists of species proposed for gazettal and being considered for gazettal.

The WAWRC now has continuing programmes of research and, in addition to the list of gazetted species, has five unofficial priority lists of Reserve Flora for each of the eleven management regions into which CALM has divided the state:

- Priority One Species - species known from only a few localities, which are on lands under immediate threat, and are in urgent need of further survey work,
- Priority Two Species - species known from only a few localities, which are on lands not under immediate threat, and are in urgent need of further survey work,
- Priority Three Species - species known from several localities, some of which are on lands not under immediate threat, and are in need of further survey work,
- Priority Four Species - species presumed to be extinct, and
- Priority Five Species - species considered to have been adequately surveyed and are not endangered or in need of special protection but could be if circumstances change.

These lists are modified and updated as relevant information and results of survey work become available. Priority One, Two and Three species are under consideration for declaration as rare flora, pending the outcome of further survey work. Priority Five species are being monitored.

APPENDIX 4 - DESCRIPTION OF LANDFORM UNITS

UNIT A

Unit A mainly includes the area of land between the westerly spur from Mt Tooleburrup to Dillon Bay, the main ridge line, and the land behind the Blossoms Beach dune system. It also includes small adjoining areas which display similar constraints to rural-residential use.

Steep sections within this general area, including the coastal cliffs and limestone gully have been excluded from this land unit.

This unit includes predominantly sand of variable depth over limestone, with granitic outcrops and soils of variable depth over granite.

The unit is densely vegetated, with the height of the vegetation reflecting the depth of soil and exposure to wind. Where the soil is deep, *Agonis flexuosa* (native peppermint) grows to over 4m-6m tall.

While there are numerous suitable land envelopes for residences throughout this area, where soils are deeper, slopes are appropriate, and there is protection from strong winds and overlooking, care must be taken to avoid pockets of slope over approximately 10%, granite and limestone outcrops, shallow soils, and exposed locations. Preliminary work has identified many suitable locations for residences in this area. The area contains attractive landforms and scenery with ocean views possible and has high scenic amenity value.

This unit is set back from the mobile dune system a sufficient distance, so that encroachment of sand into Unit A in the very long term is unlikely, and the effects of wind borne sand are minimised.

LAND QUALITY RATING - UNIT A

The unit is appropriate for development provided suitable development controls are imposed, and care is taken to find the best locations for building envelopes and accessways.

Fire prevention controls will be important in this area.

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	Provided pockets of granitic outcrops and limestone are avoided.
Foundation Stability	High	Provided pockets of granitic outcrops and limestone are avoided.
Water Logging Hazard	Low	Provided pockets of granitic outcrops and limestone are avoided.
Water Erosion Hazard	Moderate	Pockets of steeper slope require

		care
Wind Erosion Hazard	Moderate	Wind erosion hazard decreases farther from coast
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Mod-High	Care in choice of building envelope required
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Mod	Suitable fire controls necessary

Land Capability Rating - Moderate (Class II - III)

UNIT B

This unit comprises areas of granitic outcrops in the vicinity of Tooleburrup Hill. It contains two dwellings and some farm buildings.

There are some areas of deep sandy soils and red soils, interspersed with granitic outcrops and shallow soils over bedrock.

Slopes are variable, being steeper near Tooleburrup Hill and in pockets to the north-west of Tooleburrup Hill.

The vegetation cover, while dense, is also quite variable in height. In sheltered locations the peppermints are over 6m in height.

With the exception of the higher slopes, most of the unit is protected from strong winds.

Care would be required to locate building envelopes and accessways in accordance with defined criteria, to ensure that the less suitable areas are avoided and that development is unobtrusively located.

LAND QUALITY RATING - UNIT B

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High-Mod	Provided care taken in the location of building envelopes to avoid granitic bedrock
Foundation Stability	High	Care in choice of envelope location required
Water Logging Hazard	High-Low	Care required in location of envelopes
Water Erosion hazard	Low-Mod	
Wind Erosion Hazard	Low	
Wave Erosion Hazard	Nil	
Flood Hazard	Low	
Soil Absorption Ability	High-Low	
Water Pollution Hazard	Low	
Soil Salinity	Low	
Bush Fire Hazard	Mod	Fire protection controls important

Land Capability - Moderate (Class III provided granitic outcrops are avoided)

UNIT C

This unit comprises generally deep sandy soils on gentle slopes, with tall native peppermint forest predominating. The area is protected from strong winds.

While land qualities are overall suitable for rural residential use, this unit does not have the potential for views and thus would be less in demand for rural-residential purposes, since the particular attraction of the area is its scenic coastal landscape.

A perusal of aerial photography between 1969 and 1987 and historical records show that the dunes to the west pose no threat to this unit. Revegetation along this edge of the dune area appears to gradually be occurring. Attempts by the Wellstead family to stabilise a section of the dune sands in the past, have been successful. A buffer at least 100m wide adjoining the dunes has been allowed for, however, to minimise the effects of windblown sand in windy weather.

Some care may be required near the other boundaries of this unit where soils may be shallow over the granitic bedrock.

LAND QUALITY RATING - UNIT C

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	
Foundation Stability	High	
Water Logging Hazard	Low	
Water Erosion Hazard	Low	
Wind Erosion Hazard	Low	
Wave Erosion Hazard	Nil	
Flood Hazard	Low	
Soil Absorption Ability	Mod-Low	
Water Pollution Hazard	Low	
Soil Salinity	Low	
Bush Fire Hazard	Low-Mod	Fire prevention controls necessary

Land Capability Rating - High (Class II)

UNIT D

This unit contains areas of granitic outcrops, limestone and some deep sand carrying peppermint woodland, south of Fishery Beach.

The unit contains a granitic hill 100 metres in height with generally moderate to steep slopes.

Fishery Beach is used by the fishing industry for boat mooring and unloading purposes. This beach is currently under investigation as the preferred location for a major boat launching facility to serve Bremer Bay.

As is typical of most of the peninsula this unit has some suitable areas for building envelopes, taking into account slopes, soils, vegetation cover, visual exposure, and protection from winds. However much of the land would be unsuitable and building envelopes would require careful selection.

LAND QUALITY RATING - UNIT D

LAND QUALITY	RATING	REMARKS
Ease of excavation	High-Mod	Care required in choosing building sites to avoid underlying rock
Foundation stability	High	Care required in choosing building sites
Water Logging Hazard	Low-Mod	Care required in choosing building sites.
Water Erosion Hazard	Moderate	
Wind Erosion Hazard	Low-Mod	
Wave Erosion Hazard	Nil	
Flood Hazard	Low	
Soil Absorption Ability	Variable	
Water Pollution Hazard	Variable	
Soil Salinity	Moderate	
Bush Fire Hazard	Moderate	Fire prevention controls required

Land Capability - Moderate (Class III - IV)

UNIT E

Unit E lies in a broad valley and is roughly bound to the west and south by the main ridge and a spur line.

The slopes, which are predominantly less than 10%, are towards Short Beach.

The soils are variable but are generally deep sands and sand over limestone. Some shallow soils over granitic bedrock are situated on the higher ground towards units B and F.

The valley is generally well drained and vegetated with a range of plant communities. Areas of steeper slopes and lower vegetation within this unit should be avoided for building envelope and access purposes.

The topography ensures scenic views are obtained throughout this unit. However, strong easterlies are experienced.

Provided that bush fire control measures are implemented, and care is taken to avoid steeper slopes and shallow soils, this unit is capable of accommodating rural residential use.

LAND QUALITY RATING - UNIT E

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	Possible areas of exception - near units B and F
Foundation Stability	High	
Water Logging Hazard	Low	
Water Erosion Hazard	Low	
Wind Erosion Hazard	Moderate	
Wave Erosion Hazard	Nil	
Flood Hazard	Low	
Soil Absorbtion Ability	Moderate	
Water Pollution Hazard	Low	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	Fire management measures necessary

Land Capability - Moderate (Class II - Class III)

UNIT F

This unit on the eastern side of the peninsula near the Black Point - Point Gordon promontory, contains elevated land with mostly shallow soils over granitic bedrock, and some pockets of deeper sand.

Some areas of this unit have excessive slope, are exposed to strong winds, and have low vegetation.

However, attractive views are gained, and some building envelopes may be possible where slopes and soils permit, protection from winds is achieved, and development can be unobtrusive.

LAND QUALITY RATING - UNIT F

LAND QUALITY	RATING	REMARKS
Ease of excavation	Low-High	
Foundation Stability	High	
Water Logging Hazard	Low-Mod	
Water Erosion Hazard	Moderate	
Wind Erosion Hazard	Moderate	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Moderate	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	

Land Capability - Moderate (Class III)

UNIT G

Unit G, which is located east of Banky Beach, comprises generally sandy soils of variable depth over granitic bedrock, which merge with outcropping limestone to the west. The unit is exposed to strong winds, has a generally low dense vegetation cover, and contains areas of steep slope.

However, the scenic quality is exceptional and the owner has selected a house site close to the southern boundary of his property.

LAND QUALITY RATING - UNIT G

LAND QUALITY	RATING	REMARKS
Ease of Excavation	Low-High	
Foundation Stability	Mod-High	
Water Logging Hazard	Low-Mod	
Water Erosion Hazard	Moderate	
Wind Erosion Hazard	High	
Wave Erosion Hazard	Low	
Flood Hazard	Nil	
Soil Absorption Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Moderate	
Bush Fire Hazard	Moderate-High	

Land Capability - Low (Class IV)

UNIT H

Unit H, which is bound by the main ridge line and a spur behind Banky Beach contains predominantly sandy soils and limestone ridges, although some granitic outcrops also occur. The predominating sand and limestone are well-drained. The vegetation is of variable height.

Although care would be required with the positioning of building envelopes, there are numerous locations where the soils, slopes, vegetation, accessibility and exposure factors are such that rural residential use can be supported.

LAND QUALITY RATING - UNIT H

LAND QUALITY	RATING	REMARKS
Ease of Excavation	Mod-High	Care required in the location of building envelopes
Foundation Stability	Mod-High	
Water Logging Hazard	Low	
Water Erosion Hazard	Low-Mod	
Wind Erosion Hazard	Moderate	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Moderate	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	Fire management measures necessary

Land Capability - Moderate (Class III)

UNIT I

This unit to the south west of Banky Beach contains predominantly sandy soils with a dense cover of peppermint and medium shrubs.

While there are good locations for building envelopes, care would be required to avoid exposed situations.

LAND QUALITY RATING - UNIT I

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	Care required in the vicinity of granite
Foundation Stability	Mod-High	
Water Logging Hazard	Low-Mod	
Water Erosion Hazard	Low-Mod	
Wind Erosion Hazard	Low-High	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	Fire protection controls necessary

Land Capability - Moderate (Class III)

UNIT J

This unit, in the south-east of the study area, is bordered on the west by the main ridge line.

The soils are variable and include sand, limestone, granitic outcrops and shallow soils over the bedrock.

Although most of the vegetation is low (below 2m) due to the shallow soils and exposed location, the pockets of taller vegetation indicate more protected sites which may have potential for residential purposes.

LAND QUALITY RATING - UNIT J

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High-Mod	Care in location of building envelope required
Foundation Stability	High-Mod	Care in location of building envelope required
Water Logging Hazard	Low-Mod	
Water Erosion Hazard	Mod-Low	
Wind Erosion Hazard	Mod-High	Care in location of building envelope required
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	

Land Capability - Moderate in selected locations (Class III - IV)

UNIT K

This unit, in the south western part of the study area, is bound by the southern granitic headland and the limit of the area of deeper sand behind Blossoms Beach.

Although the soils are predominantly shallow over outcropping granitic bedrock, there are pockets of deeper soil, sand ridges and a limestone ridge. The height of the vegetation, which varies from mainly low to 6m+ in sheltered location,s indicates favourable underlying soil conditions and protection from strong winds in places.

The unit adjoins Little Boat Harbour, a popular recreation location. Very scenic views over Dillon Bay are obtained.

Again a number of locations capable of supporting building envelopes can be found, taking into account factors associated with slopes, soils, exposure and accessibility.

LAND QUALITY RATING - UNIT K

LAND QUALITY	RATING	REMARKS
Ease of Excavation	Mod-High	Provided care taken in location of building envelopes
Foundation Stability	Mod-High	
Water Logging Hazard	Low-Mod	
Water Erosion Hazard	Low-Mod	
Wind Erosion Hazard	Mod-Low	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	Moderate	Fire prevention controls necessary

Land Capability - Moderate in selected locations (Class III)

UNIT L

This unit in the central part of the peninsula comprises generally deep sandy soils over granitic bedrock.

Generally the slopes are less than 10%, the area is protected from strong winds, and the vegetation is taller.

This unit contains land which is amongst the most capable, on the peninsula, for supporting rural residential development.

LAND QUALITY RATING - UNIT L

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	
Foundation Stability	High	
Water Logging Hazard	Low	
Water Erosion Hazard	Low	
Wind Erosion Hazard	Low	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Moderate	
Water Pollution Hazard	Low	
Soil Salinity	Low	
Bush Fire Hazard	Low-Mod	

Land Capability - High (Class II)

UNIT M

This unit comprises both mobile and stabilising sand dunes behind Blossoms Beach. The unit also includes a buffer zone around the dune system which may be affected by encroachment and wind born sand.

Immediately behind Blossoms Beach is a low foredune which shows considerable revegetation with pioneering species, since grazing ceased in the 1970's.

A perusal of aerial photographs for the years 1969, 1976, 1982 and 1987 shows revegetation and increasing stabilisation of the dunes in the northern and southern sections of this unit.

Although it does not appear that the dunes are being replenished with sand from the beach, the leading edge of the central mobile dune area is continuing to advance in a north-westerly direction. A preliminary perusal of aerial photos indicates, that there has been a maximum rate of advancement of 1m per annum for a limited area.

This unit is not appropriate for rural residential development.

LAND QUALITY RATING - UNIT M

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	
Foundation Stability	Very low	
Water Logging Hazard	Low	
Water Erosion Hazard	Moderate	
Wind Erosion Hazard	High	
Wave Erosion Hazard	Severe	At western edge of unit only
Flood Hazard	Nil	
Soil Absorption Ability	High	
Water Pollution Hazard	High	
Soil Salinity	Low	
Bush Fire Hazard	Low	Moderate on periphery of unit

Land Capability - Very Low (Class V)

UNIT N

This unit comprises the granitic cliffs and steep slopes adjoining the coastline, as well as the less steep hinterlands of these, where the granitic bedrock outcrops or is very close to the surface. Vegetation cover is less than 1m high or non-existent and soils also are shallow or non-existent. This unit is highly exposed to coastal winds.

This unit is not particularly capable of supporting development. Most of this unit is expected to be protected by reserves. However, some limited portions may remain in private ownership if covered by landscape protection controls.

LAND QUALITY RATING - UNIT N

LAND QUALITY	RATING	REMARKS
Ease of Excavation	very Low	
Foundation Stability	Mod-High	
Water Logging Hazard	Mod-High	
Water Erosion Hazard	Low-Mod	
Wind Erosion Hazard	High	
Wave Erosion Hazard	Low	
Flood Hazard	Nil	
Soil Absorption Ability	Low	
Water Pollution Hazard	Mod	
Soil Salinity	Low-Mod	
Bush Fire Hazard	Low-Mod	

Land Capability - Very Low (Class V)

UNIT O

Unit O consists of steeply sloping vegetated land with shallow soil covering. It includes some steep coastal slopes behind the granitic cliffs, the limestone ravine behind Native Dog Beach, and the gullies near Little Boat Harbour and Lot 2098.

Steep slopes are not capable of supporting rural-residential development unless non-standard development techniques are used.

While most of this unit should be protected by the extension of reserves, portions in some location may be satisfactorily included in private property provided landscape protection controls are imposed.

LAND QUALITY RATING - UNIT O

LAND QUALITY	RATING	REMARKS
Ease of Excavation	Low	
Foundation Stability	Mod-High	
Water Logging Hazard	Low	
Water Erosion Hazard	Mod-High	
Wind Erosion Hazard	Low-High	
Wave Erosion Hazard	Nil	
Flood Hazard	Nil	
Soil Absorption Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low	
Bush Fire Hazard	High	

Land Capability - Very Low (Class V)

UNIT P

This unit comprises the beaches and their immediate hinterlands (approximately 100m deep), with the exception of the Blossoms Beach hinterland, which is contained within Unit M. The hinterland requires protection to safeguard the environmental stability of this unit.

The unit is not capable of supporting rural residential use unless non-standard development techniques are employed.

LAND QUALITY RATING - UNIT P

LAND QUALITY	RATING	REMARKS
Ease of Excavation	High	
Foundation Stability	High-Low	
Water Logging Hazard	Low-Very High	
Water Erosion Hazard	Mod-High	
Wind Erosion Hazard	High-Very High	
Wave Erosion Hazard	High-Very High	
Flood Hazard	Nil	
Soil AbsorPtion Ability	Low-Mod	
Water Pollution Hazard	Low-Mod	
Soil Salinity	Low-Mod	
Bush Fire Hazard	Low-Mod	

Land Capability - Very Low (Class V)