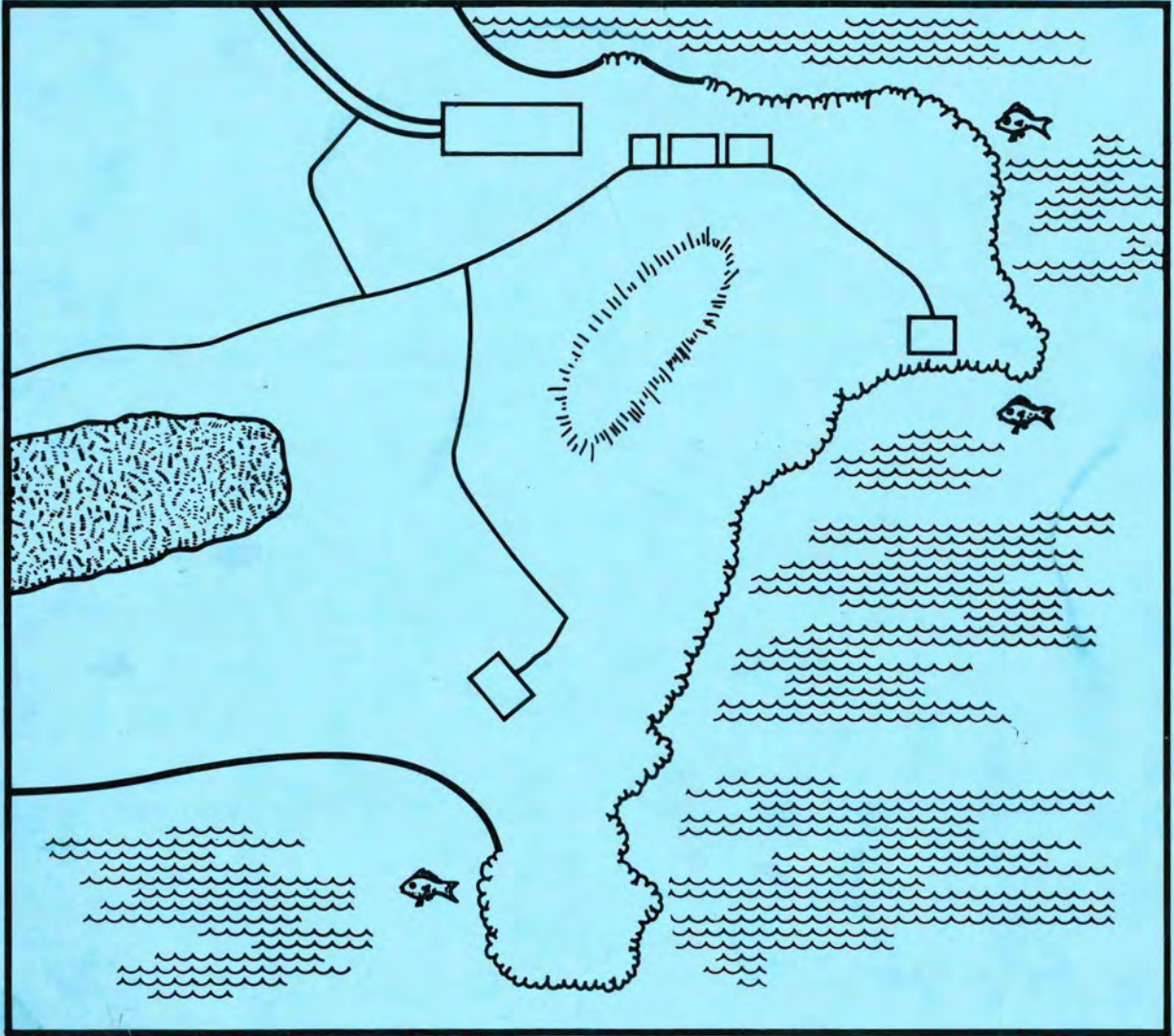


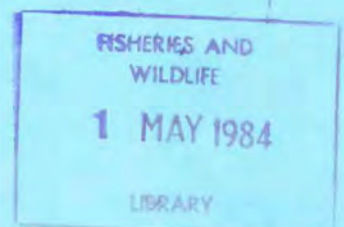
Starvation Boat Harbour

Coastal Management Plan



Department of Conservation and Environment
Western Australia

Bulletin 151
February 1984



Starvation Boat Harbour Coastal Management Plan

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Department of Conservation and Environment

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Ravensthorpe Shire Council



**Department of Conservation and Environment
Western Australia**

Bulletin 151

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1. INTRODUCTION

1.1 LOCATION/USE

Starvation Boat Harbour is located in Ravensthorpe Shire 50 kilometres east of Hopetoun. The major access to the site is via Fence Road which turns off the South Coast Highway. At this point Ravensthorpe lies 40 kilometres to the west and Esperance is 147 kilometres east (see Figure 1).

It is a popular local recreation venue which has suitable waters for boating, swimming and fishing and sheltered land areas for overnight stay.

1.2 RESERVE/MANAGEMENT AUTHORITY

Currently Starvation Boat Harbour is contained in Reserve 7580 (2,250ha) and Reserve 9393 (1,406 ha) which are vested with the Agriculture Protection Board (APB) for control of rabbits.

The initial move to consider the control and management of Crown land on the south coast came from the Environmental Protection Authority (EPA) Red Book, 'Conservation Reserves for Western Australia, 1976'. It suggested setting up a working group to advise on the coastal situation.

Following the initiative of the Ravensthorpe Shire Council (RSC) and with the approval of the EPA it was decided to set up local working groups containing 5 to 9 local residents and representatives from Government Authorities.

The Ravensthorpe Working Group emphasised the present and anticipated high recreation use of the coast. It expressed the need for the Shire to undertake a greater role in reserve management particularly with respect to the provision of local recreation amenities and coastal protection measures.

The Ravensthorpe Working Group report (1980) has been endorsed by the EPA. It recommended that two areas be excised from the ABP's reserve 9393 and 7580. One reserve would be suitably vested in the Ravensthorpe Shire Council for recreation purposes. This reserve may be expanded in time by the inclusion of additional APB land. The other reserve will be for the purpose of conservation of flora and fauna and vested in the Western Australian Wildlife Authority (WAWA) (see Figure 2).

1.3 TENURE AND MANAGEMENT OF ADJOINING LAND

The inland area adjacent to the proposed recreation reserve is recommended for vesting with the WAWA due to its diversity of flora, attractive natural landscape and limited access with consequent wilderness appeal.

Lake Shaster Nature Reserve, of 10517 ha, lies to the east of Starvation Boat Harbour. This reserve, vested in the WAWA contains a significant coastal wetland.

To the west lie the Jerdacuttup Lakes complex which the EPA has recommended as an A class reserve vested in the WAWA.

The area to the west, south of Southern Cross East Road extending to high water mark, is currently recommended as a reserve for the purpose of Recreation with vesting in the Shire of Ravensthorpe. The long-term proposal to upgrade Southern Ocean East Road will result in a slight alteration of reserve boundaries in establishing the centre line survey of the new road (See section 3).

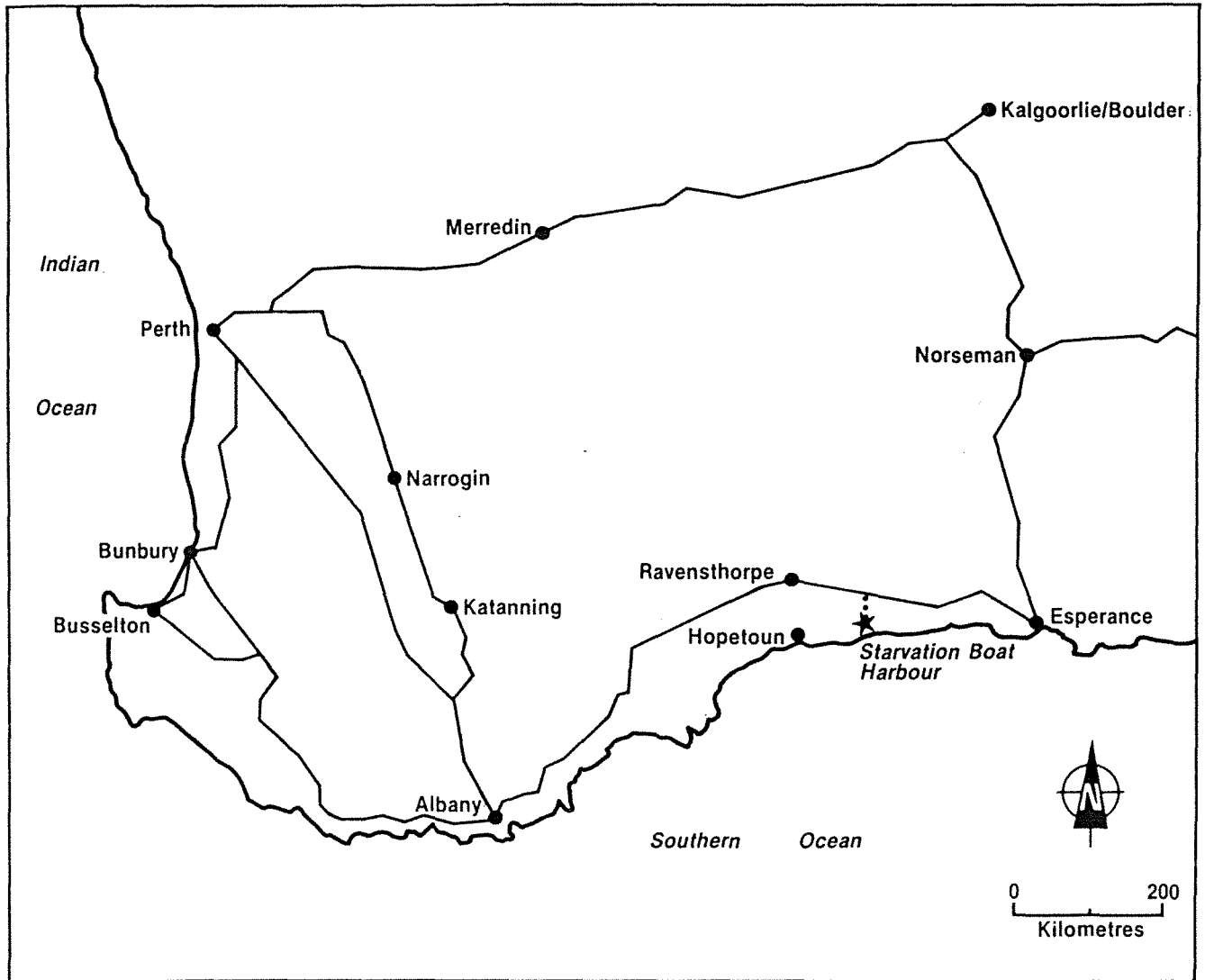


Figure 1. SOUTH COAST OF WESTERN AUSTRALIA, STARVATION BOAT HARBOUR LOCATION.

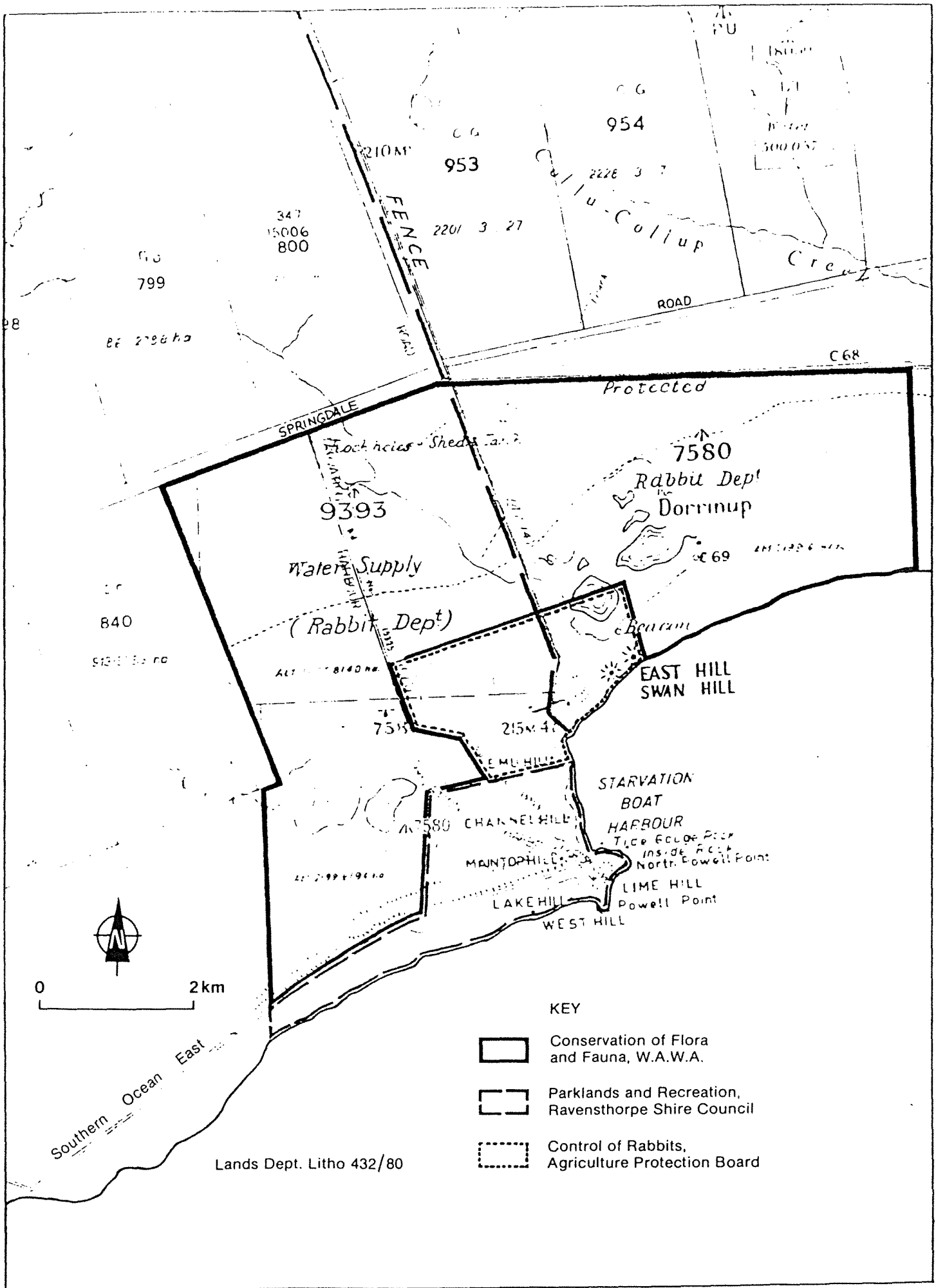


Figure 2. EPA 3.10 RECOMMENDATIONS FOR RESERVE BOUNDARIES, 1981.

1.4 PURPOSE OF MANAGEMENT PLAN

In 1981 the Land Act was amended to give the Minister the option to request Reserve Management Plans for reserves either to be, or already vested in the Local Authority.

The Starvation Boat Harbour Management Plan sets out the management strategy proposed by the Ravensthorpe Shire Council for the area recommended for vesting in its control. The plan aims at the five year work programme with the option for review of proposals if necessary. It has been drafted with the assistance of local persons who use Starvation Boat Harbour.

2. RESOURCES

2.1 GEOLOGY AND LANDFORMS by W. McArthur

The area has a basement of Precambrian granitic and metamorphic rocks which are mainly obscured by various consolidated and unconsolidated Quaternary Sediments. The nature and distribution of these materials produces landscape elements which react differently to use and management. There are four main geological members.

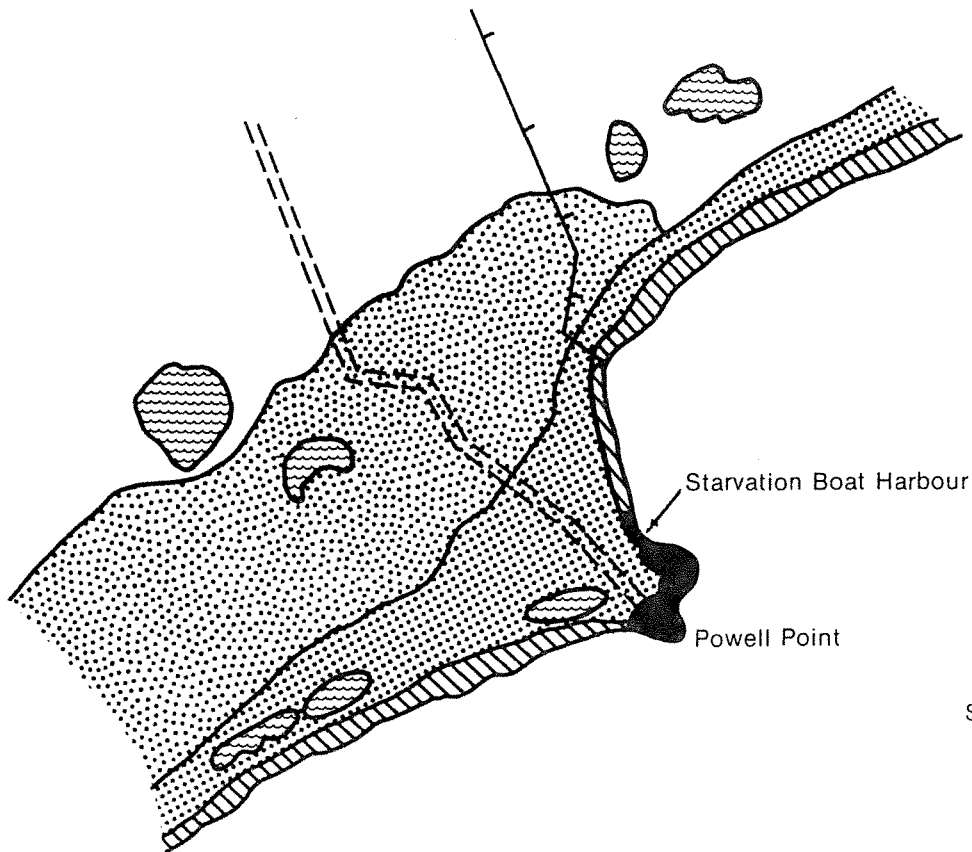
- (a) The entire area of Point Powell is underlain by Precambrian migmatites, meta-sediments, and meta-granites (Thorn, Lipple, and Sanders, 1977). These may be seen outcropping at Powell and north Powell Points and along the beach in Starvation Boat Harbour.
- (b) A low ridge of Coastal Limestone of late Pleistocene age lies parallel to the present coastline and a few hundred metres inland. This was formed from sand and shell fragments blown onshore from the continental shelf when sea level was much lower than at present. Later it was consolidated by solution and redeposition of lime.
- (c) Inland from the limestone ridge the country is covered by a thin veneer of sandy detritus often formed into hummock and linear dunes. The sand probably originated from weathering of Plantagenet sediment which once covered this area and was probably distributed in early Holocene times.
- (d) The Holocene coastal deposits, formed from beach sand and broken shell fragments, are represented by both beach ridges and dunes.






The ridges, which are left stranded as the shoreline recedes, may be seen immediately north of the boat launching ramp and again along the northern margin of the Harbour. The dunes are represented by two distinct phases of accumulation. The younger phase, present mainly to the west of Powell Point, are separated from the limestone ridge by a depression with lakes.

The older phase, present as remnants of dune material, extends inland from the south facing coast, for about three kilometres. Only the younger phase dunes are prone to instability when disturbed and those to the west of Powell Point show considerable damage.

2.2 CLIMATE/ASPECT

The area experiences a mild Mediterranean climate with the driest months between November and April. Hopetown has a Bureau of Meteorology recording station. The annual average rainfall recorded over 82 years is 502mm with 51 per cent falling between May and August.



	Coastal dune sand.	Holocene
	Coastal Limestone	Late Pleistocene
	Sandy detritus often blown into dunes and hummocks	Quaternary
	Migmatite	Proterozoic
	Lake	

(Older types may be covered with veneer of recent sand.)

Based On — 1:250,000 Geological Series Ravensthorpe S1/51-5,
(Thom, Lipple, Sanders, 1977)

Figure 3. STARVATION BOAT HARBOUR GEOLOGY

The average January maximum temperature is about 30°C and the average July minimum is 18°C. Cool breezes and cloudy weather predominate for most of the year.

The dominant wind direction and intensity for Starvation Boat Harbour can be summarized from the four years of records held by the Bureau of Meteorology, Perth.

Summer AM winds are mainly south westerlies which tend south, south-east towards the end of the season. The prevailing PM winds are south easterlies often reaching 11 to 20 kilometres per hour. North westerly winds are experienced throughout the day for June/July. In August/September AM winds tend westerly while PM winds tend south westerly. October/November sees a gradual return to the summer wind pattern.

The coast's orientation with respect to predominant winds and waves is of significance. The beaches open to the southwest experience high energy conditions and a massive steep dune has developed. The headland is protected by rock outcrop. Where sand deposits occur they are prone to erosion by prevailing south easterlies. The beach from Tide Gauge Rock east is the most sheltered from weather conditions and consequently represents the most popular recreation site. The adjacent bay has a south easterly aspect with fragile dunes displaying a two to three metre erosion scarp.

2.3 VEGETATION by G. Craig

The plant communities in the vicinity of Starvation Boat Harbour reflect the degree of shelter from salt spray and wind blast, and the degree of soil development. The more exposed, seaward slopes of foredunes are colonized by sea rocket (Cakile maritima), hairy spinifex (Spinifex hirsutus), Euphorbia paralias and Atriplex isatidea.

The foredune crests have low, wind-pruned vegetation including Scaevola crassifolia, Westringia dampieri, coast daisy-bush (Olearia axillaris), native pigface (Carpobrotus virescens) and knotted club rush (Scirpus nodosus). On the landward slope and swale of high foredunes (e.g. Powell Point) low shrubs and trees of teatree (Melaleuca lanceolata) dominate.

In areas of consolidated sand a mixed heath and shrubland can be found. Ridge fruited mallee (Eucalyptus angulosa) is often dominant with Spyridium globulosum, Acacia rostellifera and cockies' tongues (Templetonia retusa) being common.

At the base of the coastal limestone ridge at the proposed caravan park site a community of showy banksia (Banksia speciosa), one-sided bottle brush (Calothamnus quadrifidus) and bell-fruited mallee (E. preissiana) is present.

Further inland there are thickets of chittick (Lambertia inermis) and showy banksia (B. speciosa) and low heath with emergent tallerack (E. tetragonia).

The coastal vegetation of the APB reserve to the northeast of Starvation Boat Harbour was burnt in 1982. Fire represents a hazard to the entire area as it increases its vulnerability to erosion especially from vehicle tracks. Further, the regeneration of native plants is very slow and there is little research on the recovery time needed for them to be successfully reinstated.

2.4 WILDLIFE

The natural vegetation provides a habit for a wide variety of animals, including reptiles, frogs, birds and mammals.

The Ravensthorpe Shire Council will endeavour to collect biological information on the reserve through consultation with the Department of Fisheries and Wildlife and by a log kept by the Ranger (see section 6.2).

2.5 WATER

The Public Works Department has completed an initial hydrological survey to assess groundwater supplies. As a result of limited geophysical work it must be concluded that prospects of finding reasonable quantities of potable water in this area are quite poor.

2.6 CONSTRUCTION MATERIAL

Ravensthorpe Shire Council has some small sources of gravel material within the Starvation Boat Harbour Reserve. Council is aware of the harmful impact of dieback fungus (Phytophthora cinnamomi) and will investigate proposed gravel extraction sites, for example, by consultation with the Department of Fisheries and Wildlife. This should not represent a cost to Council.

When the gravel is extracted for road construction the pits will not be obtrusive and suitable restoration measures will be undertaken, i.e. replacement of top soil. In general the landscape will not be impaired by extraction or dumping activities.

3. EXISTING ACCESS ACTIVITIES AND FACILITIES

Fishermen first gained access to Starvation Boat Harbour via a coastal track from Hopetoun. The building of Fence Road made the area more accessible to farmers from Jerdacuttup and Ravensthorpe who enjoy the area's isolation and lack of development. The advent of four-wheel drive in Australia increased the number of people holidaying in remote locations and has placed many areas including Starvation Boat Harbour under pressure due to uncontrolled tracks and dune erosion.

In 1973 a gravel road leading directly to Starvation Boat Harbour was built and had the effect of opening the area to the general public. A gravel road linking Starvation Boat Harbour and Hopetoun is planned in the long-term. This road will be aligned to join the existing Starvation Boat Harbour Road northwards of the existing 4WD track in order to retain space for recreation landuse. A coastal route will probably increase visitor numbers.

Greatest use of the area is during summer weekends and holiday periods. Some professional fishermen also camp in the area (staying for up to one month). The site is one of the few suitable boat launching areas between Hopetoun and Esperance. The sheltered waters are also ideal for swimming and the Jerdacuttup School conducts regular swimming classes.

Figure 4 shows the location of facilities. The road access terminates in the main day users' carpark. In practice caravans also stop here. There is a vehicle access to the beach and boats can be launched using 4WD over the sand. People take the nearest track to the beach, which adds to the foreshore erosion problem. There are shade trees towards the rear of the carpark and pan toilets have been placed there. There is a track to the rubbish tip near the carpark entrance.

Numerous vehicle tracks lead to the best camping area sheltered by attractive trees. People tend to drive to a site and spread out their belongings. Camping in this manner has damaged the dune vegetation. Some fireplaces are provided and people have attacked the bush for firewood.

Other 4WD tracks lead to the main fishing spots. Here the vegetation is damaged where vehicles park and manoeuvre.

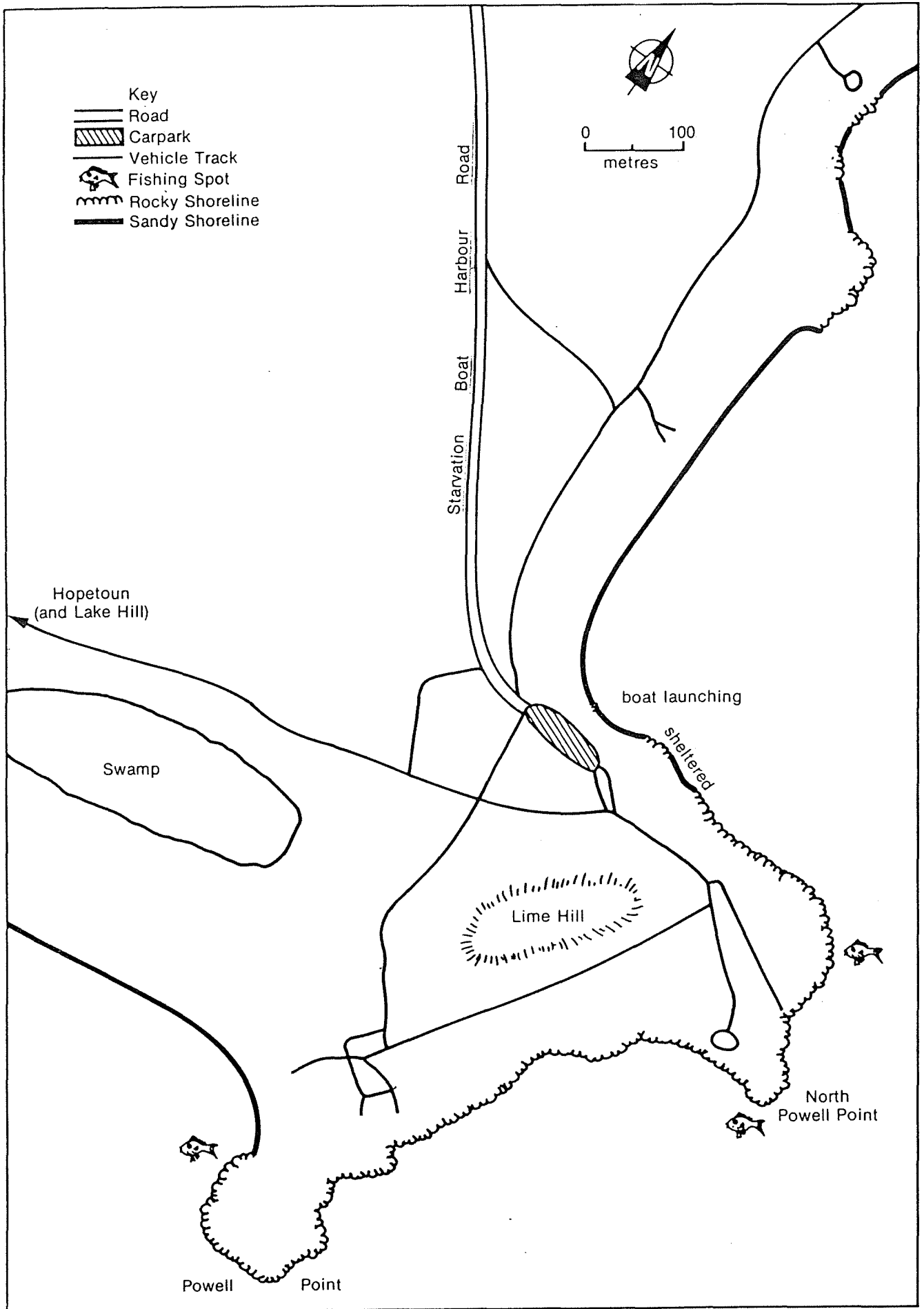


Figure 4. STARVATION BOAT HARBOUR PLAN OF EXISTING SITE



Photograph 1. Foreshore vegetation damage caused by camping activities.



Photograph 2. 4WD tracks need to be controlled to protect the vegetation and landscape amenity.

4. ASSESSMENT OF MANAGEMENT NEEDS

4.1 FUTURE LANDUSE PRESSURE

Starvation Boat Harbour has become more popular as a camp site and fishing venue in recent years. At peak times people compete for space. Visitors would benefit from proper management of areas designated for specific activities.

As more facilities are provided at Starvation Boat Harbour the area will attract more visitors. For example, the provision of a caravan park with tap water, toilets/changerooms and barbecues will increase the number of visitors.

A long-term planning objective for the area involves consideration for a townsite. The proposition is premature for treatment in this Management Plan. It will be dependent upon a suitable water supply and on meeting the requirements of relevant State Government Authorities. It may be considered in the 1989/90 review of the Management Plan.

4.2 IDENTIFICATION OF SENSITIVE/ROBUST AREAS

The coastal environment is essentially fragile to landuse due to the soil's fragile nature and susceptibility to erosion once the vegetaton cover is disturbed. Foredune and dune ridges are exposed to the wind which increases the erosion problem. These areas are also heavily used by people.

The biological balance of the inland swamps requires protection.

The high dunes at Powell Point are eroding and sand is being blown along a wind tunnel. There are also very steep dunes along the beaches adjacent to Southern Ocean East Road. Management is required to prevent damage to these areas.

The environment is more robust further inland, as soils are more developed and this permits a greater variety of vegetation to grow. Coastal heath often has a dense growth which also serves as a deterrent to people's tracks. It is a valuable component of the natural landscape and should be protected.

4.3 MANAGEMENT PRIORITIES

As the Reserve's management will need to be undertaken on a restricted budget, the key areas which require attention have been identified. Priority management is based on an area's use and the current level of environmental damage (see Figure 5 for the location of management sites).

Site 1 is the most heavily used area that focuses on the sheltered beaches. People's activities include swimming, fishing, boat launching and currently camping and caravanning.

Site 2 relates to the popular fishing spot around Powell Point.

Site 3 provides beach access at two currently used sites along the north eastern bay.

4.4 ADEQUACY OF EXISTING MANAGEMENT

Management to date largely relies on people 'doing the right thing' and 'tidying up' by Ravensthorpe Shire Council workers. Additional controls are necessary to preserve the attractive environment and facilitate people's use of the area.

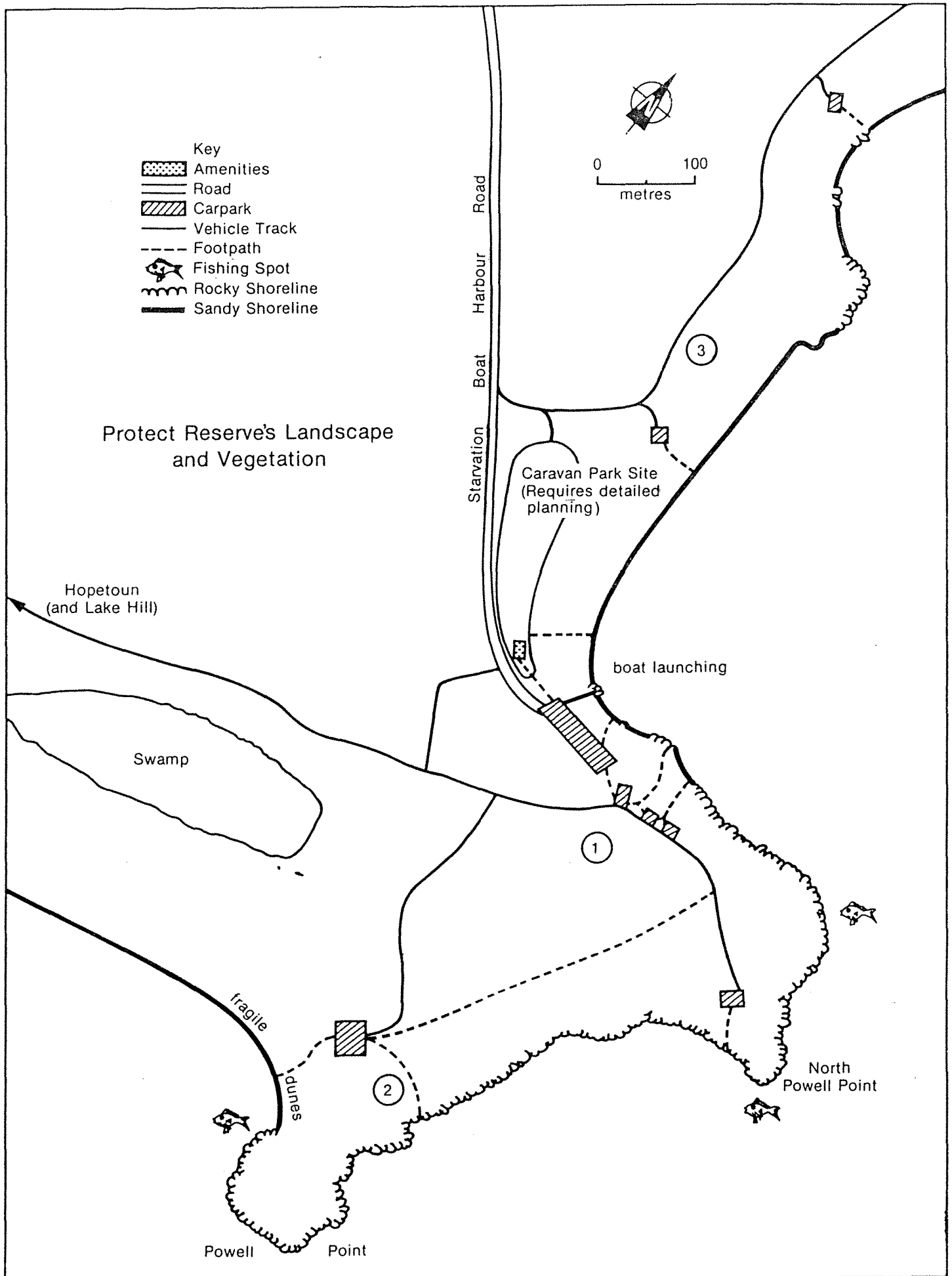


Figure 5. STARVATION BOAT HARBOUR PRIORITY MANAGEMENT SITES

5. MANAGEMENT PLANNING

5.1 MANAGEMENT AIMS

The following general management aims are identified for Starvation Boat Harbour Reserve when vested with the Ravensthorpe Shire Council.

1. Conserve vegetation and wildlife of the reserve.
2. Protect the coastal dunes.
3. Preserve the attractive landscape.
4. Undertake fire protection measures to reduce bushfire hazard.
5. Provide access and management in key use areas.

Starvation Boat Harbour is currently designated for 'Level 2' management in the Ravensthorpe Shire Policy for Recreation Amenities. It is intended to provide facilities for short-term stay, such as, a caravan park.

5.2 MANAGEMENT OBJECTIVES

1. Develop a system of vehicle tracks, carparks and paths to give access to the main attractions of the Reserve.
2. Develop camping, caravan and picnic facilities which provide for the needs of visitors.
3. Provide a boat launching ramp.
4. Provide a safe swimming area.
5. Undertake effective foreshore management to control beach access and protect dune systems.
6. Erect signs and an information display to assist visitors in their use of the area and at the same time gain their co-operation in protecting the environment.
7. Undertake regular maintenance of the reserve area, i.e. control rubbish, provide wood, clean toilets, initiate beach management projects.
8. Commence investigations into the feasibility for a future town site or holiday accommodation at Starvation Boat Harbour.
9. Provide a tourist lookout on Lime Hill. A path will lead from the proposed car park at the base of the hill and it will be sited to minimise erosion and to blend in to the landscape.

5.3 STRUCTURE PLAN

Ravensthorpe Shire Council proposes to develop the recreation and short term stay facilities at Starvation Boat Harbour over the next five years. Already, there is an evident need for a caravan park with a camping area which will take some of the main user pressure off the sheltered foreshore. The use of the foreshore can then be reserved for day visitors and adequately managed to protect the trees and dune plants. The caravan park will be located north east of the major car park. It will be

set back from the existing track along this beach and access will be via the Starvation Boat Harbour Road. All overnight stay will be restricted to the caravan park once it is established.

Vehicle tracks to popular fishing and swimming spots will be accompanied by carparks and beach paths. Vehicle movements will be restricted to the tracks provided and the vegetation will be encouraged to regenerate on closed tracks by ripping up the compacted surface and covering it with brush.

An important part of Starvation Boat Harbour's appeal is its natural character. In order to preserve the native flora only native species listed in Section 2.3 of the plan will be used if planting is undertaken for management purposes. If extra shade is required moonah (Melaleuca lanceolata), ridge-fruited mallee (Eucalyptus angulosa) and Acacia rostellifera will be favoured. This measure relates specifically to management aims 5.1.1 and 5.1.3.

An information display board will show a plan of the Reserve indicating facilities and access. It will briefly outline management objectives and request people's co-operation in protecting the environment.

The Ravensthorpe Shire Council as the management authority will encourage local involvement in projects and maintenance of the area. Council's proposals for management of Sites 1 to 3 are detailed in Section 5.4.

5.4 MANAGEMENT SITES

5.4.1 Site 1 (see Figure 6)

Carparks

1. Carparks will have a gravel surface and suitable provision for drainage. They will be fenced with log rails to blend in with the environment and effectively restrict movement over dune vegetation. Paths will lead to the beach and facilities such as a lookout, toilets etc.
2. The main carpark will be rationalised. The location of the boat ramp will depend on the assessment by the Public Works Department. Boats will be required to move away from the beach area and vehicles will not be permitted to park on the beach. An arrangement will need to be made to allow swimming classes use of suitable sheltered water. People should walk to the beach via the boat ramp or beach path leading from the carpark.
3. Small carparks will be constructed as shown on Figure 6. With the provision of the caravan park these areas will be reserved for day visitors and picnic activities.
4. A carpark will be constructed at north Powell Point for use by fishermen.

Tracks

5. Some existing 4WD tracks will be closed. Access tracks will be maintained by Ravensthorpe Shire Council and in most cases they will be able to be used by conventional vehicles.
6. Vehicle tracks will be blocked off along the foreshore between the existing main carpark and the proposed carparks. This should permit vegetation regeneration and improve the area's appearance. There will still be a footpath linking these areas.

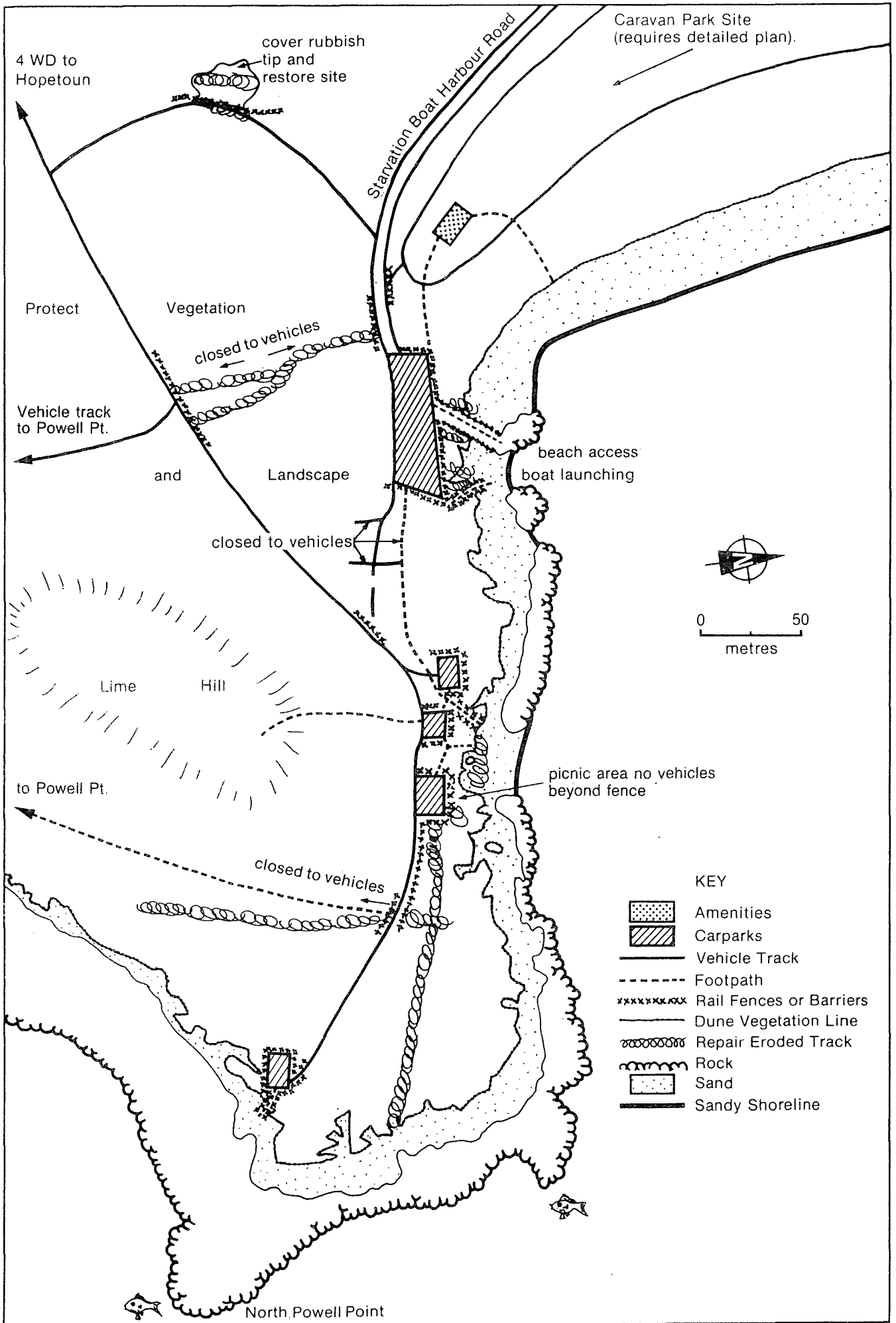


Figure 6. SITE 1, MANAGEMENT PLAN

7. A track continuing on the alignment of the Starvation Boat Harbour Road and turning off before the main carpark will provide vehicular access to Powell Point and the new carparks. It has less impact on the landscape compared to nearby tracks which will be closed to allow vegetation to regrow.
8. The 4WD track connecting north Powell Point and Powell Point will revert to a footpath.
9. A footpath will be constructed leading from the new carparks to the proposed lookout on Lime Hill.

Overnight Stay

10. The provision of a caravan park provides a key to managing the foreshore. No camping will be permitted outside the facility. There will be more room for day visit activities and management will aim to protecting the environment, especially the vegetation. The caravan park will have capacity for some 60 vans. Pan toilets may be provided initially until funds are available for an amenities building. This will also require an adequate water supply.
11. The existing pan toilets will be maintained.
12. The existing shack located on the foreshore will be removed.
13. Ravensthorpe Shire Council will organise the provision of wood at barbecue sites. This is an attempt to discourage firewood foraging and damage to trees. Gas barbecues may be considered in the long-term.

Rubbish

14. The existing rubbish tip will be covered and the vegetation restored on the site. Ravensthorpe Shire Council policy is to remove rubbish from the Reserve. Day visitors will be encouraged to take their rubbish home while bins will be provided at the caravan park and be emptied by the Council.

Signs

15. An information display board will be erected near the entrance of the caravan park. It will show a plan of the reserve indicating facilities and access. There will be a brief explanation of management objectives and how people may co-operate in protecting the environment.
16. There will be sufficient directive signs for people to co-operate with the management objectives. There will be a short message painted on a routed wood board; for example, 'Path', 'Protect Vegetation', 'Please Use Path'.

5.4.2 SITE 2 (see Figure 7)

Carpark

1. As fishermen frequent the beaches south of Powell Point a gravel carpark will be constructed along the existing track. The carpark and beach path will be fenced in order to protect dune vegetation from the damage currently evident from tracks.



Photograph 3. Proposed caravan park/camping site located between Starvation Boat Harbour Road and the foreshore.



Photograph 4. View towards Powell Point Lime Hill shows attractive landscape.

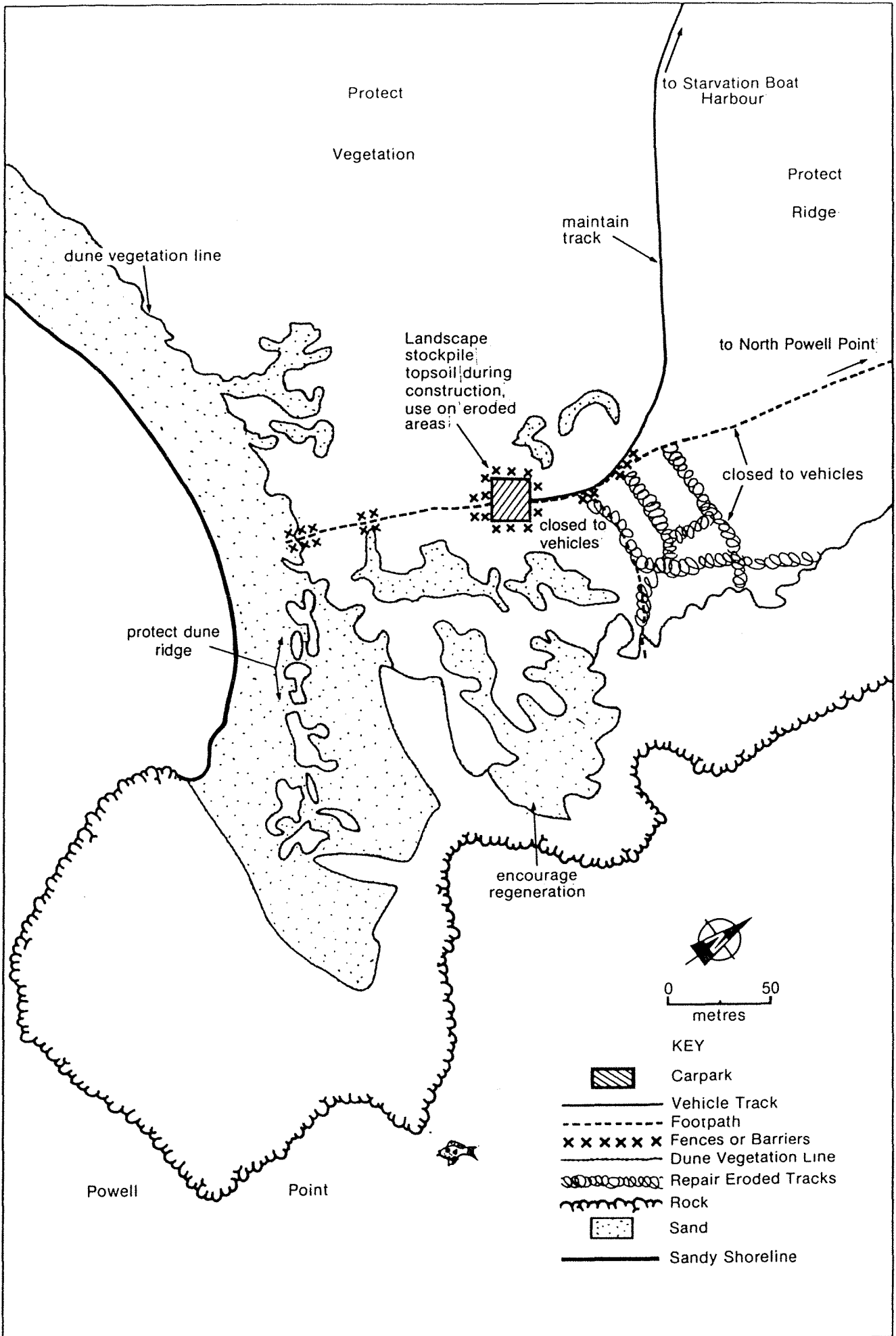


Figure 7. SITE 2, MANAGEMENT PLAN

Tracks

2. Other vehicle tracks in this vicinity will be ripped up, covered with top soil where possible and allowed to regenerate.

Other matters

3. Camping is not permitted at this site and visitors will be encouraged to take their rubbish back with them.
4. Signs will be used to indicate management.
5. The track to Lake Hill west of the swamp will be managed as required.

5.4.3 Site 3 (see Figures 8 and 9)

Car Parks

1. Gravel carparks will be provided at two currently used beach access sites along the track leading to the north. They will be fenced and have beach paths. Nearby tracks will be ripped and regrowth encouraged.

Other matters

2. The caravan park will effectively cut off vehicle access from the main carpark (site 1) to the northern beaches. Access will be provided from Starvation Boat Harbour Road 750 metres further north.

5.5 FIRE MANAGEMENT

Fire control will generally be in accord with the WAWA Policy on Fire in Nature Reserves, as adopted in 1975.

If fire breaks prove necessary they will be planned following consultation with the Fire Liaison Office, Fire Research, Bush Fires Board of W.A. and with WAWA and the Agriculture Protection Board where they control adjoining lands.

A prescribed burning programme will be developed as necessary with the dual aims of reducing the fire hazard and regenerating the vegetation. Special attention will be given to recreation areas. Picnic fires will be permitted only in developed recreation areas, subject to the provision of the Bush Fires Act.

The control of wild fires on Shire of Ravensthorpe vested Reserves will be the responsibility of local Brigades.

Assistance will be sought from the WAWA and the Bush Fires Board as appropriate and available in order to ensure equitable sharing of costs and the implementation of acceptable fire control plans.

6. IMPLEMENTATION

6.1 MANAGEMENT PRIORITIES

Ravensthorpe Shire Council will be the management authority for Starvation Boat Harbour Reserve. The Reserve Management Plan outlines the ongoing management commitment for a five year period and it establishes a priority order for works based on a general budget constraint. Management priority relates to the immediate need of a caravan park to assist in control of overnight stay activities, the current competition for space and the need to protect the foreshore vegetation.

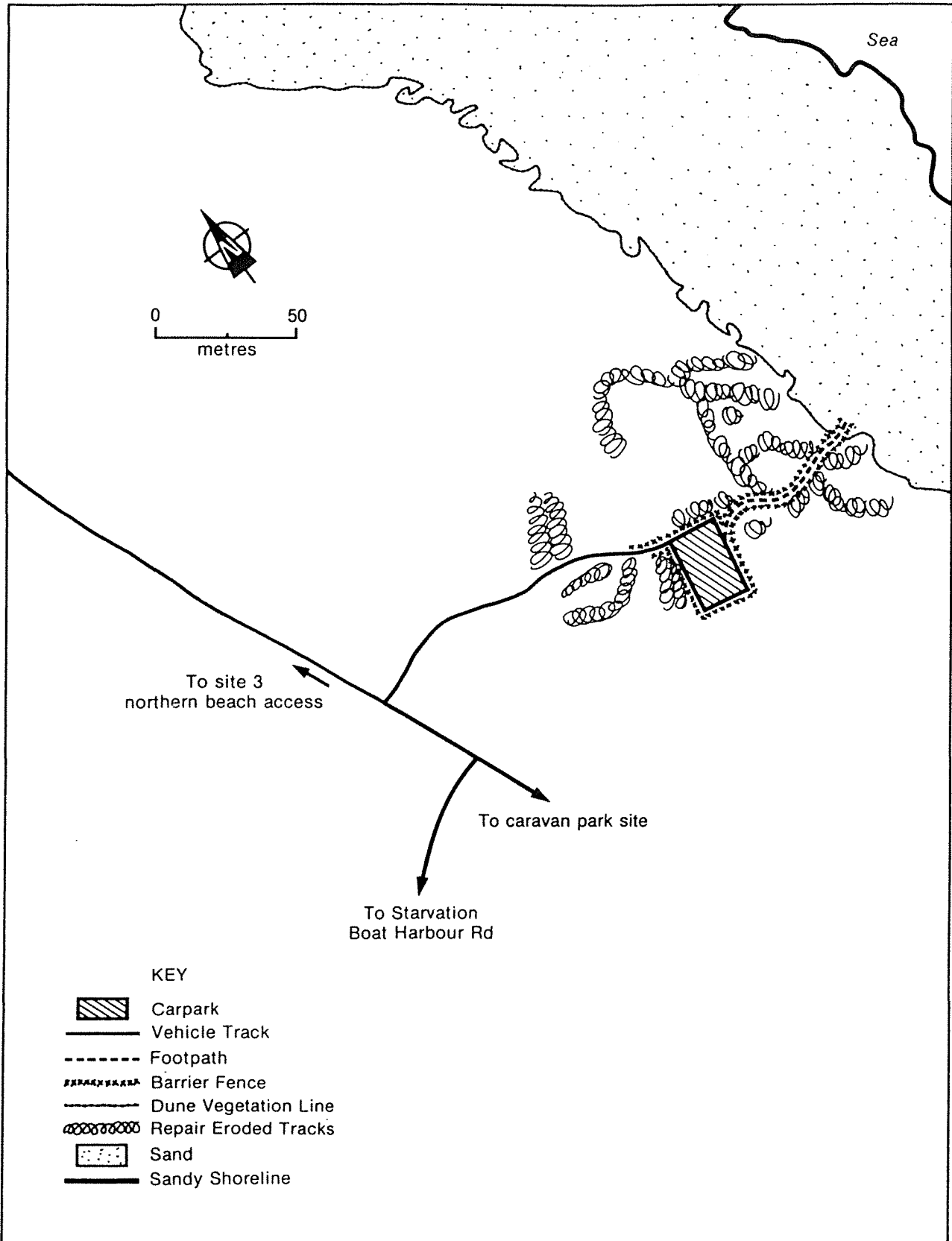


Figure 8. SITE 3, MANAGEMENT PLAN

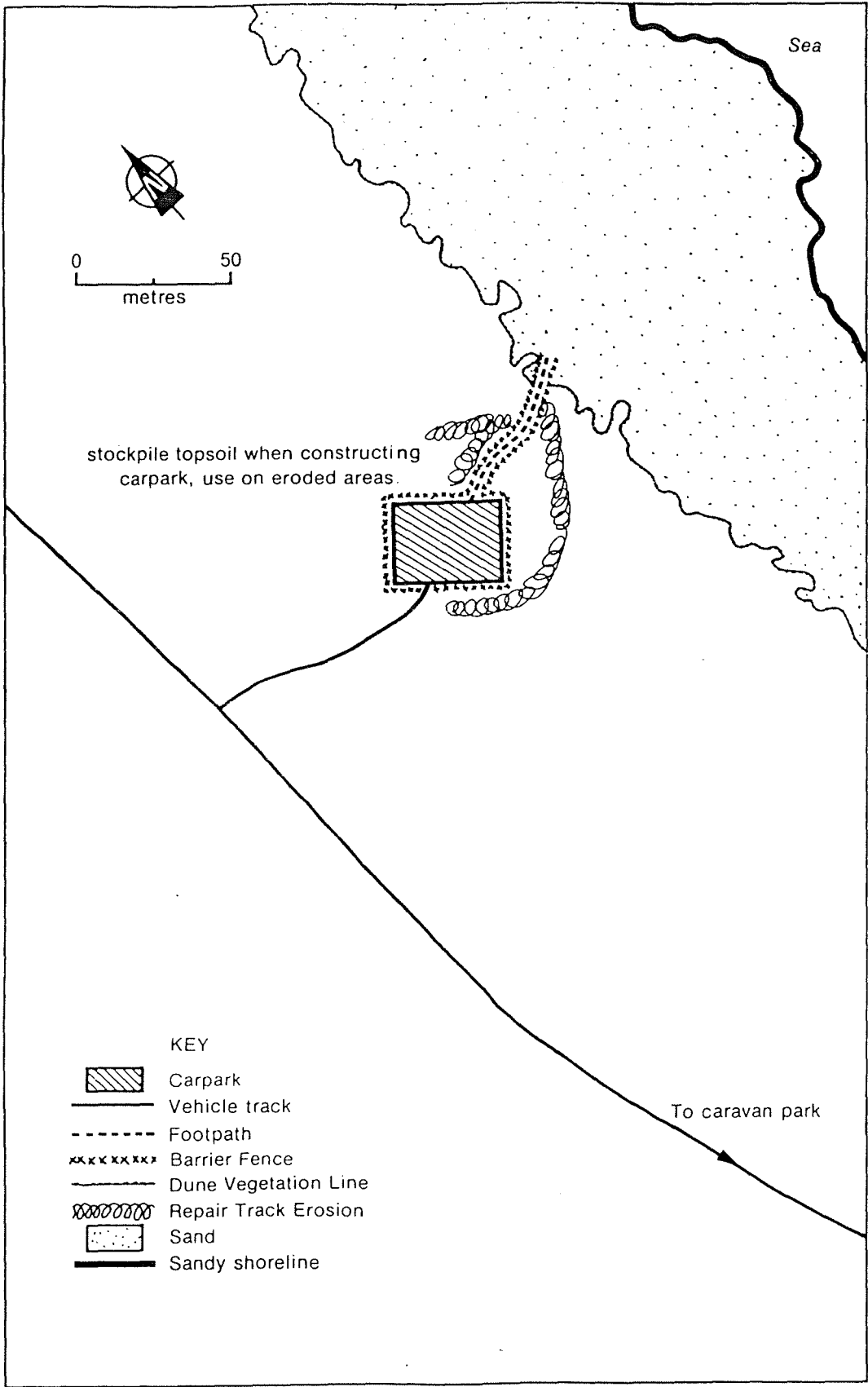


Figure 9. SITE 3, NORTHERN BEACH ACCESS, MANAGEMENT PLAN

It relates to the main people pressure problems. In practice, projects may need to be undertaken out of their priority order to take advantage of materials, plant or staff that may be on site. For example, the construction of all carparks may be undertaken at one time related to the supply of gravel, plant and staff. Ablution facilities may be delayed due to the level of capital expenditure and the outcome of investigations into availability of water.

6.2 STAFF

Council intends to appoint a Ranger at Starvation Boat Harbour during the peak holiday periods. The Ranger will undertake to collect garbage, clean toilets and provide fuel for barbecues. The Ranger will control illegal camping, fires and vehicle activities not in accordance with the Reserve Management Plan.

6.3 FUNDS

The Ravensthorpe Shire Council will explore avenues of Government assistance for advice and funding of specific projects.

7. MANAGEMENT PLAN SUMMARY

7.1 SITE 1

- . Rationalise gravel carparks to cater for activities at the sheltered beach and at north Powell Point.
- . Erect log fences to define the carparks and beach paths.
- . Construct a boat ramp upon advice from the Public Works Department, Harbours and Rivers branch.
- . Allocate suitable sheltered water for swimming purposes.
- . Rationalise vehicle access tracks and close duplicated tracks to allow vegetation regrowth.
- . Provide footpaths to popular recreation sites and to a lookout on Lime Hill.
- . Establish a caravan park and camping facility.
- . Provide pan toilets where required until funds are available for an ablution building and water supply.
- . Remove the shack located on the foreshore of the sheltered beach and establish an attractive dayuse picnic area.
- . Provide wood at barbecue sites or gas if gas barbecues are installed.
- . Control rubbish removal.
- . Provide a visitor's information board and erect necessary directive signs.

7.2 SITE 2

- . Construct a gravel carpark to cater for beach use south of Powell Point.
- . Erect rail fences to define the carpark and beach paths.
- . Maintain the beach access at Lake Hill, west of the swamp.
- . Block off duplicated vehicle tracks and encourage vegetation regrowth.
- . Prohibit camping.
- . Control rubbish removal.
- . Erect necessary directive signs.

7.3 SITE 3

- . Construct two gravel carparks to cater for existing beach use to the north.
- . Erect log fences to define the carpark and beach paths.
- . Encourage vegetation regrowth on unnecessary tracks.
- . Provide access to the north from Starvation Boat Harbour Road.

- . Prohibit camping.
- . Control rubbish removal.
- . Erect necessary directive signs.

7.4 GENERAL

Achieve the aims and objectives of the Management Plan. In particular;

- . protect the environment and facilitate carefully managed recreation use.
- . undertake regular maintenance and employ a part-time Ranger or Honorary Warden during the summer holiday periods.
- . Undertake fire control measures.

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REFERENCES

Environmental Protection Authority, 1976, Conservation Reserves for Western Australia, Systems 1, 2, 3, 5: Environmental Protection Authority, Perth.

Thom R., Lipple S.L. and Sanders C.L., 1977 1: 250,000 Geological Series - Ravensthorpe, Western Australia: Australian Government Publishing Service, Perth.