

Read

DUNE MANAGEMENT PLAN

NELLY BAY BEACH

Shirley Comber,

*Comber has requested to submit to
M.C. immediately to C.*

Accept ✓ on a draft

March 1994

MANAGEMENT OF THE DUNE/BEACH RIDGE SYSTEM AT NELLY BAY

1.0 INTRODUCTION

The beach ridge/dunal system at Nelly Bay is characterised by a distinct plant community which is commonly known as a beach scrub. This particular beach scrub is somewhat different to other beach scrubs in the dry tropical coast between Ingham and Proserpine. Nelly Bay is situated in a higher rainfall belt and the beach scrub at this site is slightly taller and has more species present than other beach scrubs in the region. The Nelly Bay beach scrub is the only remaining example of its type and the retention of this outstanding plant community is essential from a conservation perspective and also to retain the character and attractiveness of Nelly Bay Beach.

Beach camping and beach related passive recreation have been occurring at this beach over many decades and the impact of such activities on the beach scrub has in general been fairly low. However, in recent times areas adjacent to the beach scrub have been subdivided and increased pressure is being placed on this area through recreational usage and activities aimed at suppressing invasive weed species.

The steady degradation of this beach scrub through invasion by exotic species and modification of the floristic composition should be countered and this can be achieved by adopting a comprehensive management plan.

2.0 SITE DESCRIPTION

Nelly Bay is located 42 kilometres to the north of Proserpine. Nelly Bay Beach extends for about 800 metres and is aligned towards the northwest. The beach is backed by beach ridges which extend up to 120 metres inland. A small creek entrance is located some 300 metres from the southeastern end of the beach. This creek only flows during the peak of the wet season but is significant in that substantial areas of bare sand exist adjacent to the entrance indicating that the entrance is subject to substantial fluctuations during peak flows.

The sand forming the beach ridges is fairly coarse and the height of the beach ridges is in the order of 2 to 3 metres above mean high water spring tides. The beach ridge system because of its relatively low exposure is not particularly vulnerable to wind erosion and there has been little development of the beach ridge system by the deposition of wind blown sand. However, the area is vulnerable to erosion by wave action and rapid coastline recession could occur during cyclonic conditions. The extent of such short term erosion could impact on the beach scrub vegetation and such impact would be compounded by the resulting loss of strand line vegetation which protects the beach scrub from salt laden winds. The erosion prone area width along this section of the coastline is 95 metres measured landward from the seaward toe of the frontal dune.

3.0 VEGETATION DESCRIPTION

The frontal dune/beach ridge supports an open-woodland community dominated by horsetail she-oak (*Casuarina equisetifolia* var. *incana*). Other species include beach almond (*Terminalia cattappa*), lollybush (*Clerodendrum inerme*), goat's foot (*Ipomoea pes-caprae*) and beach grass (*Thuarea involuta*).

Beach ridge areas landward of the frontal dune are vegetated by a notophyll vine forest or a semi-evergreen notophyll vine forest (beach scrub) with a canopy height of about 15 metres. Canopy trees include Mackay cedar (*Paraserianthes toona*), red coonoo (*Mimusops elengi*), Kamala (*Mallotus discolor*), scrub wilga (*Geijera salicifolia*), *Pongamia pinnata*, white cedar (*Melia azedarach*) and sandpaper fig (*Ficus opposita*). The beach scrub is very distinctive as it contrasts with adjacent plant communities particularly in relation to its colour, shadiness and visual attractiveness. A more comprehensive list of plant species found in this beach scrub is included in Table 1.

The plant community abutting the beach scrub on the landward side is a eucalypt open-forest. This community is not on the beach ridge system.

4.0 ISSUES WHICH NEED TO BE ADDRESSED

- (a) Invasion of the dune/beach ridge system by exotic species particularly Guinea grass (*Panicum maximum*) and the existing control techniques (mainly slashing).
- (b) Clearing of dunal vegetation and opening up of the tree/shrub canopy.
- (c) Planting and continued presence of exotic species.
- (d) Frontal dune stability with respect to wind erosion.
- (e) Removal of millable timber.
- (f) Assistance with the management and enhancement of the Nelly Bay area by volunteer groups.

5.0 NELLY BAY BEACH MANAGEMENT PLAN

5.1 Objectives

The Management Plan for Nelly Bay Beach is aimed at preserving and enhancing the conservation values of the beach scrub community, ensuring stability against wind erosion, and preserving the coastal amenity and character of the area while facilitating recreational use and enjoyment by present and future generations.

5.2 Achievement of objectives

The objectives of the Management Plan can be achieved through the implementation of a zoning system, application of specific management procedures

for each zone, and employment of adequate controls and dune protection structures to support the management procedures. The zoning system which forms the basis of the Management Plan is presented as Figure 1 and it should be noted that a specific management procedure is to be established for each sector (e.g. A1, B1 etc.) indicated on the management plan.

5.3 Zones and applicable management procedures

A weed control program is presented as Appendix 1 and a planting program is presented as Appendix 2. A detailed management procedure is to be established for each sector shown on the Management Plan.

5.3.1 Zone 1 - Strandline vegetation

The management procedures for this zone are as follows:-

- (a) Protect strandline vegetation adjacent to the beach related passive recreation area by using appropriate markers or structures. Any structure should be a psychological deterrent rather than a physical barrier.
- (b) Beach access tracks should be located at specific points adjacent to the passive recreation areas and in other areas pedestrian control should be minimal.
- (c) A fringe of horsetail she-oak should be maintained along the frontal dune/beach ridge to act as a wind break and salt trap thereby offering protection to beach scrub areas further inland.
- (d) The ground cover should be enhanced so that the sand surface is protected against wind erosion. Plantings will be required on an irregular basis depending on climatic conditions and erosion events. Appropriate species for use in any planting program are as follows: Goat's foot (*Ipomoea pescaprae*), beach grass (*Thuarea involuta*), lollybush (*Clerodendrum inerme*), and vitex (*Vitex trifolia*).
- (e) Frontal dune areas may be strategically fertilized to improve the vegetative cover but this needs to be done in accordance with an approved program prepared to meet specific requirements.

5.3.2 Zone 2 - Hind dune area requiring restoration

This area was cleared in the period when the adjacent subdivision was being developed. Restoration of this area is required to enhance and expand the adjacent beach scrub community, to reduce the area available for weed infestation and to provide a boundary adjacent to the road system which will allow easier control and provide advantages for interpretative and educational purposes.

The management procedures for this zone are as follows:-

- (a) A planting program needs to be undertaken with native plant species grown from seed taken from the adjacent area. Any plantings, using an appropriate mix of plant species, will need to be done in accordance with a schedule of operations prepared for this specific purpose.
- (b) Natural regeneration is occurring and this should be encouraged to facilitate rapid development of the canopy cover.
- (c) Vehicle control barriers will need to be installed at various sites depending on the rate of revegetation progress and the notice taken of signage and minor barriers by people operating vehicles in the area.
- (d) A weed control program will need to be instigated to control infestation by exotic species and will need to be done in accordance with an approved procedure.

5.3.3 Zone 3 - General purpose access corridor, vehicles and pedestrians

Nelly Bay is a popular destination for local residents and visitors alike. The amount of visitation will increase and will place even more pressure on this area.

Access will need to be controlled and this is a key component of the Management Plan. Access to the beach for mobility impaired persons has been provided for seaward of the main parking area. Establishment of a car parking area near the southern end of the beach may be feasible and could be further investigated if the need arises. Access to such a facility would have to be through the buffer zone landward of the area zoned for conservation.

The management procedures for this zone are as follows:-

- (a) All vehicle and pedestrian traffic needs to be restricted to the main access tracks and pathways so that trees can establish as close as practicable to the sides of the tracks to maximise the amount of canopy cover over the tracks.
- (b) Vehicle barriers need to be of sufficient size to be effective without being excessively obtrusive.
- (c) Pedestrian control measures should be inclined towards psychological barriers and markers/guides and not towards manproof fencing.
- (d) Weed species are to be controlled particularly along the sides of the tracks to avoid weed establishment in adjacent areas.

5.3.4 Zone 4 - Beach related passive recreation

Dune/beach ridge systems in relatively protected locations such as Nelly Bay can accommodate considerable recreational usage provided that appropriate measures

are taken to restrict damage and to protect the frontal dune. The containment of recreational sites and limitation of the type of recreational experiences available to users, to beach related activities reduces impact on the frontal dune.

The management procedures for this zone are as follows:-

- (a) Vehicle traffic is to be excluded from passive recreation areas.
- (b) Pedestrian traffic is to be restricted from frontal dune areas by the use of appropriate structures, vegetation plantings and guides.
- (c) Recreational amenities such as tables, shelters and seating are to be placed to minimise disturbance to existing vegetation and to allow the tree cover to increase over passive recreation areas.

5.3.5 Zone 5 - Conservation area

The beach scrub at Nelly Bay is in reasonable condition. However, as this type of plant community is very restricted along the coastline every attempt needs to be made to ensure that it is managed to retain its integrity and to maintain it as a fully functioning and discrete plant community.

The management procedures for this zone are as follows:-

- (a) Unrestricted access and encroachment into the area selected for conservation needs to cease as soon as practicable.
- (b) Modified areas should be revegetated, with appropriate plant species grown from seed collected locally, in an approved restoration procedure.
- (c) A weed control program should be undertaken as per an approved weed control procedure.
- (d) Removal of millable timber or interference with upper-story species that could result in opening up of the canopy cover should not occur.
- (e) Local groups have expressed a willingness to undertake restoration work within the area and full advantage should be made of this opportunity. However, any works should only be undertaken under guidance from officers of the Department of Environment and Heritage and should be as per procedures set down by the Department of Environment and Heritage. A grid system has been prepared over the area and any works undertaken would need to be orderly and consistent with the grid layout (Refer Fig. 1).
- (f) The potential fire risk posed by mature and hayed off stands of Guinea grass needs to be kept within acceptable limits and this can be achieved by reducing fuel loads adjacent to or under beach scrub vegetation and separating the various stands of Guinea grass so that any fire outbreak can

be isolated.

5.3.6 Zone 6 - Buffer area

The integrity of the beach scrub community at Nelly Bay will depend on suitable buffering from outside influences and events, and in this regard a buffer area has been set aside around the area of concern. A particularly important facet is one of fire control and the buffer area incorporates existing tracks or roads wherever possible.

The management procedures for this zone are as follows:-

- (a) Provision for firebreaks within the buffer area needs to be made and this should also incorporate capability to isolate fire within cells or patches within the buffer area. This will give the capability for a mosaic type burning pattern. Existing old vehicle tracks and natural topographic features should be used wherever possible to form the basis for the interconnecting firebreak system.
- (b) A regular controlled burning program of the buffer area is to be undertaken.
- (c) A weed control program needs to be initiated in this area to reduce the potential for weed invasion into nearby beach scrub areas. Weed control priority is not as high as in other zones but must be considered as a long term goal.

6.0 CONCLUSION

The adoption of the Management Plan for Nelly Bay Beach will allow the retention and enhancement of the exceptional beach scrub community at this beach, address dune stability aspects and preserve the qualities and visual attractiveness of this coastal area that is appreciated by local residents and visitors to the area.

.....
G.F. Tipman
Dune Conservationist

[BDM-024.smcl]

TABLE 1
PLANT SPECIES PRESENT IN THE
NELLY BAY BEACH SCRUB

Key: a = abundant
 c = common
 o = occasional
 r = rare
 + = present

Species list extracted from Dr P.S. Lavarack's report "The Beach Scrubs of the Central Queensland Coast"

| Common name | Scientific name | Additional information |
|---------------------------|----------------------------------|------------------------|
| Trees, shrubs | | |
| - | <i>Aidia racemosa</i> | o |
| White bean or white sirus | <i>Ailanthus triphysa</i> | r |
| Red ash | <i>Alphitonia excelsa</i> | o |
| Chain fruit | <i>Alyxia ruscifolia</i> | r |
| | <i>Arytera divaricata</i> | r/o |
| | <i>Austromyrtus bidwillii</i> | + |
| Broad leafed bottletree | <i>Brachychiton australis</i> | o |
| | <i>Bridelia leichhardtii</i> | r |
| | <i>Capparis lucida</i> | o |
| | <i>Senna surattensis</i> | r |
| | subsp. <i>retusa</i> | |
| Tripewood or silky celtis | <i>Celtis paniculata</i> | o |
| | <i>Celtis philippensis</i> | o/c |
| Lollybush | <i>Clerodendrum floribundum</i> | r |
| Cupania tree | <i>Cupaniopsis anacardioides</i> | + |
| | <i>Diospyros compacta</i> | o |
| | <i>Drypetes australasica</i> | r/o |
| | <i>Elattostachys megalantha</i> | o |
| | <i>Eugenia reinwardtiana</i> | o |
| Native cherry | <i>Exocarpus latifolius</i> | o |

| | | |
|------------------------------|------------------------------------|----------------|
| | <i>Ficus microcarpa</i> | r |
| Sandpaper fig | <i>Ficus opposita</i> | c |
| Small-leaved Mortern Bay fig | <i>Ficus platypoda</i> | o/c |
| | <i>Fitzalania heteropetala</i> | r |
| | | |
| | <i>Flueggea virosa</i> | r |
| | subsp. <i>melanthesoides</i> | |
| | <i>Ganophyllum falcatum</i> | o |
| Scrub wilga | <i>Geijera salicijolia</i> | a |
| | var. <i>latifolia</i> | |
| | <i>Glycosmis pentaphylla</i> | r |
| | <i>Grewia orientalis</i> | o |
| | <i>Guettarda speciosa</i> | o |
| Lantana | <i>Lantana camara</i> | a (introduced) |
| Kamala | <i>Mallotus discolor</i> | c |
| White cedar | <i>Melia azedarach</i> | o/c |
| | <i>Micromelium minutum</i> | o |
| | <i>Miliusa brahei</i> | c/a |
| Red coondoo | <i>Mimusops elengi</i> | a |
| | <i>Ochrosia elliptica</i> | r |
| | <i>Olea paniculata</i> | r |
| | <i>Paraserianthes toona</i> | o/c |
| | <i>Phyllanthus novea-hollandia</i> | o |
| Cocky apple | <i>Planchonia careya</i> | r |
| Burdekin plum | <i>Pleiogynium timorense</i> | o |
| | <i>Polyalthia nitidissima</i> | o/c |
| Celery wood | <i>Polyscias elegans</i> | r |
| | <i>Pongamia pinnata</i> | o/c |
| | <i>Premna dallachyana</i> | r |

| | | |
|-----------------------------|----------------------------------|----------------|
| Devil's fig | <i>Solanum torvum</i> | o/c |
| Peanut tree | <i>Stercula quadrifida</i> | o |
| | <i>Terminalia muelleri</i> | o |
| | <i>Timonius timon</i> | c |
| | <i>Turraea pubescens</i> | r |
| | | |
| Vines | | |
| - | <i>Caesalpinia bonduc</i> | + |
| | <i>Capparis sepiaria</i> | + |
| - | <i>Diplocyclos palmatus</i> | + |
| Native jasmine | <i>Jasminum didymum</i> | + |
| | subsp. <i>didymum</i> | |
| Fire vine or burney vine | <i>Malaisia scandens</i> | + |
| - | <i>Pachygone ovata</i> | + |
| | <i>Passifolia aurantia</i> | + |
| | <i>Passiflora edulis</i> | + (introduced) |
| Corky passion vine | <i>Passiflora suberosa</i> | + (introduced) |
| | <i>Pisonia aculeata</i> | + |
| Zig zag vine | <i>Rauwenhoffia leichhardtii</i> | + |
| Brazilian nightshade | <i>Solanum seforthianum</i> | + (introduced) |
| | <i>Tylophora benthamii</i> | + |
| Ground cover species | | |
| | <i>Ancistrachne uncinulata</i> | + |
| Mossman River burr | <i>Cenchrus echinatus</i> | + |
| | <i>Cyperus enervis</i> | + |
| | <i>Cyperus tetracuspis</i> | + |
| Guinea grass | <i>Panicum maximum</i> | + |

[BDM-022.smcl]

WEED CONTROL PROGRAM NELLY BAY

1. Control of weed species at Nelly Bay will need to be undertaken in a methodical and planned approach if the overall program is to be successful. To facilitate the effective execution of the weed control program the area will be split into sectors as shown on the Management Plan, (Figure 1) with permanent markers placed at the corners of the sectors for reference purposes.
2. In general, weed control measures should initially concentrate on the western and eastern ends of the site and then gradually proceed towards the more heavily disturbed and infested areas.
3. The main weed species to be controlled is Guinea grass (*Panicum maximum*) and most of the resources available should be directed towards controlling this introduced pasture species. Other weed species that will require attention in the future include lantana (*Lantana camara*), Mossman River burr (*Cenchrus echinatus*), bullhead (*Tribulus terrestris*), Brazilian nightshade (*Solanum seaforthianum*) and some species in the Passifloraceae family.
4. Control of weed species is to be achieved through a combination of techniques rather than adopting one technique or method. In all cases weed control undertaken in any particular sector must be done in accordance with a detailed work plan to be prepared by the Department of Environment and Heritage.
5. Techniques to be used to control weeds are as follows:

- (a) Spot spraying with glyphosate.

Chemical only to be applied by an operator licenced under the Agricultural Chemical Distribution Control Act. This will be particularly successful for the control of Guinea grass and other ground cover species.

- (b) Band or strip spraying with glyphosate.

Road verges and the car parking area will need regular treatment until control is achieved and then spraying will revert to spot spraying.

- (c) Cut stump or basal bark treatment with 2,4-D amine or 2,4-D/2,4,5-T ester

Chemicals only to be applied by a licenced operator. These treatments are useful to control lantana in a way that causes the least disturbance to the soil surface.

(d) Hand pulling or hand chipping.

In lightly infested areas these methods are to be used to achieve control or to maintain areas in a near weed free status.

(e) Application of mulch either natural or manufactured.

All mulch is to be free of weed seeds and is to be bio-degradable.

(f) Slashing and mowing.

Road verges, passive recreation areas and fire break areas are to be mowed as required to prevent weeds particularly Guinea grass from seeding. Areas in other sectors to be slashed only as required in the detailed weed control procedures.

6. General points

One of the objectives of the Management Plan is to achieve a self sustaining plant community which will require a minimum of further inputs once the previous degradation and vegetation modification has been rectified.

The restoration activities must be aimed at achieving a maximum canopy cover particularly over previously modified areas of the beach scrub keeping in mind limitations required for the natural functioning of this plant community.

The re-establishment of a beach scrub 'floor' that has a high percentage of organic matter and a dense cover of litter is desirable to slow down encroachment into the area by exotic species and to create conditions conducive to the natural establishment of native beach scrub species.

The maximum area available for the beach scrub community should be utilized to limit edge effects.

Vehicle traffic in all areas must be controlled to prevent soil disturbance and spreading of weed seeds.

APPENDIX 2

NELLY BAY PLANTING PROGRAM

1. An essential part of the overall Management Plan for Nelly Bay Beach is the restoration of previously degraded areas through a planting program to allow the establishment of native plants of the appropriate species and in the correct proportions to complement existing beach scrub vegetation.
2. Prior to any planting program within the beach scrub area an audit is to be carried out by the Department of Environment and Heritage to determine what the requirements are for each sector in terms of plant species and numbers of plants.
3. Seedlings to be used in the planting program at Nelly Bay must be raised from seed collected from this locality.
4. Seedlings used for any restoration work must be raised using acceptable nursery techniques and be free of disease.
5. Planting operations are only to be carried out when seasonal conditions are likely to allow successful establishment of seedlings.
6. Fertilizer can be used to improve the growth rates of establishing seedlings and to decrease the time taken to develop a canopy cover. Fertilizer rates and application rates will be detailed in the work plan for each sector.
7. Records are to be kept of the various works performed for future reference purposes.

[BDM-029.smcl]

ZONE 2 - Hind dune area requiring restoration

ZONE 3 - General purpose access corridor
vehicles and pedestrians

ZONE 4 - Beach related passive recreation

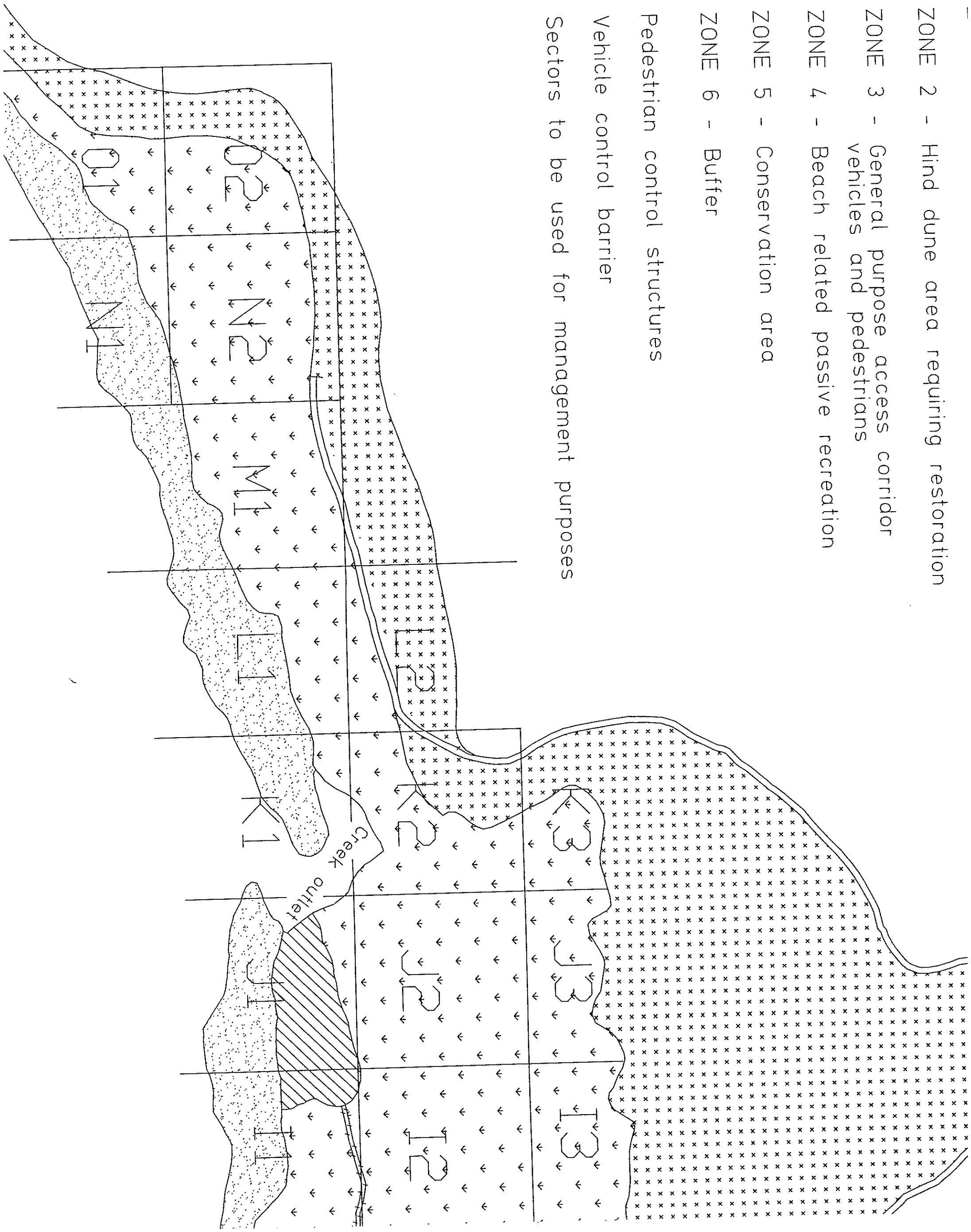
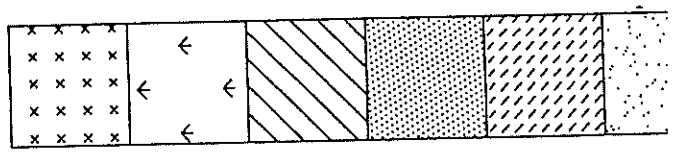
ZONE 5 - Conservation area

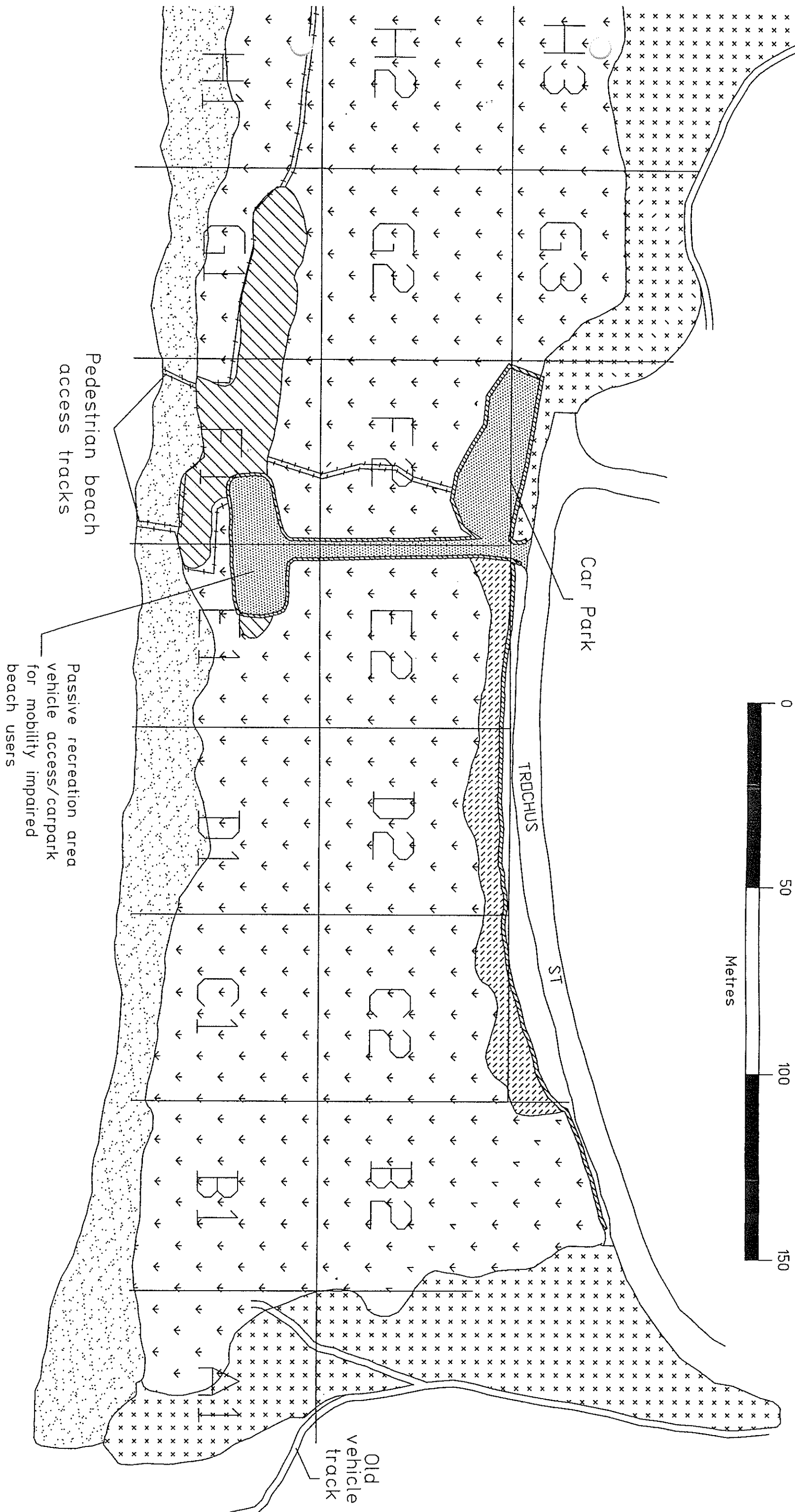
ZONE 6 - Buffer

Pedestrian control structures

Vehicle control barrier

A1, B1 etc Sectors to be used for management purposes





Plan prepared from BPA aerial photography.
 St Lawrence to Townsville. 27/6/91.