A Report to
Restormel Borough Council

PAR BEACH
Management Plan

a) Par Beach Site

Dr J Gowenlock

ENVIRONMENTAL CONSULTANTS (CTNC) LTD

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CONTENTS

1. INTRODUCTION

Environmental Consultants (CTNC) Ltd were commissioned to prepare a management plan for Par Beach by Restormel Borough Council. The plan was undertaken in response to the proposal for the site to be designated a Local Nature Reserve.

1.1 Introductory Note

The Par Beach proposed Local Nature Reserve is divided into two distinct sections: the main site at Par Beach, and the St Andrews Road site which lies approximately 0.5km to the north-west of the beach. This plan considers the management options for the Par Beach section.

1.2 Location (See Map 1)

Name	:	Par Beach
County	:	Cornwall
District	:	Restormel
Parish	:	Tywardreath
Grid Ref	:	SX 085 533
Area	:	31.2 ha
Local Planning Authority	:	Restormel Borough Council
Conservation Status	:	The semi-natural habitats on the site form part of Cornwall Nature Conservation Site R 3.3

1.3 Maps

1:50,000	Sheets 200 or 204
1:25,000	SX 05
1:10,000	SX 05 SE
1: 2,500	SX 0753 and SX 0853

1.4 Land Tenure (See Map 2)

Par Beach is partly owned by Restormel Borough Council and partly leased from the Rashleigh Estate. The Rashleigh Estate has been consulted about the potential Local Nature Reserve and support the designation. The southern boundary of the proposed Reserve is mobile and legally extends to the high tide line wherever this happens to be.

The Cornish coastal footpath crosses the site and many other paths on the site have long established public use.

MAP 1. PAR BEACH MANAGEMENT PLAN
Location

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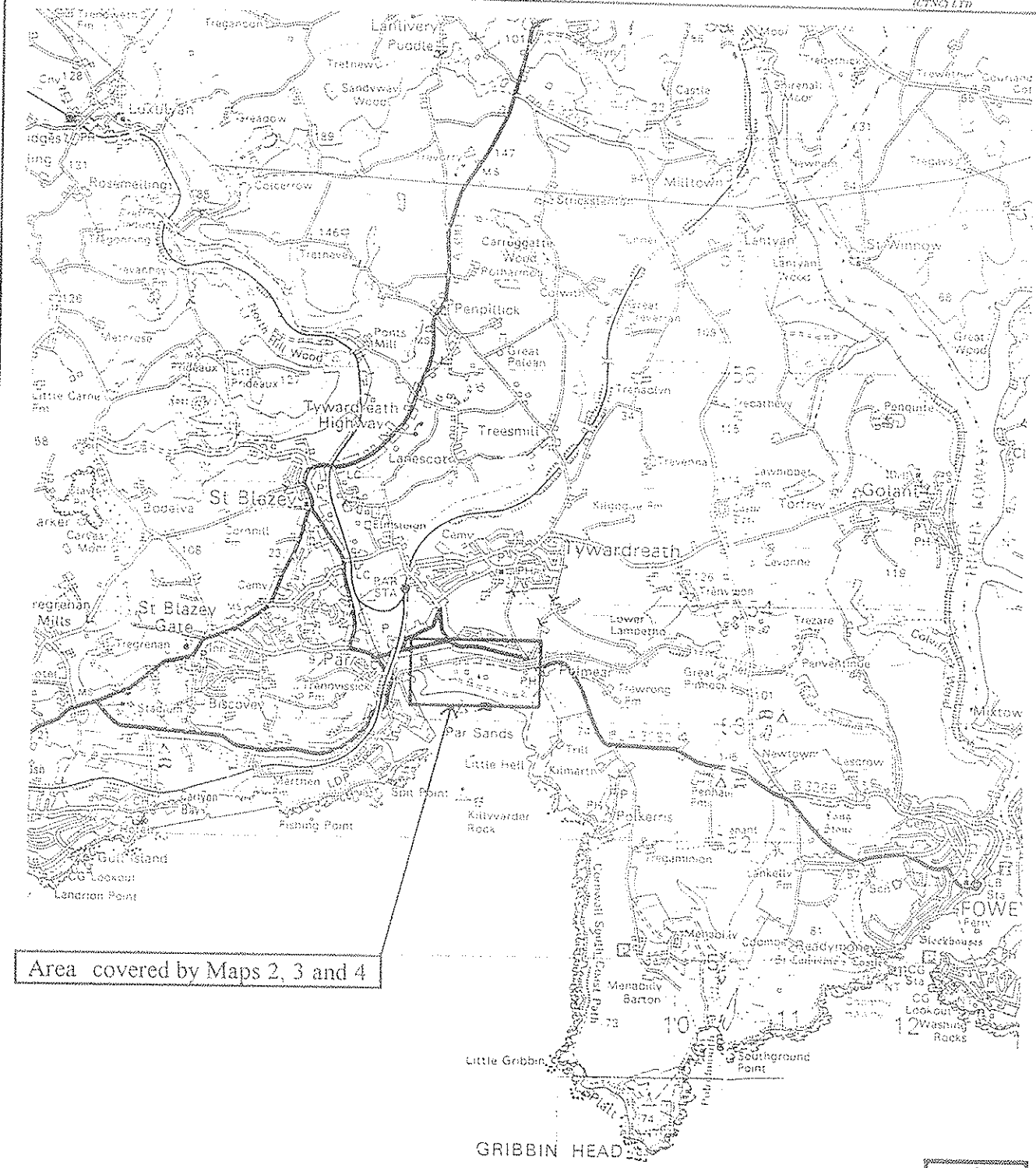

Scale: 1:50,000

MAP 2. PAR BEACH MANAGEMENT PLAN
Tenure and public access

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TENURE

- Proposed Local Nature Reserve boundary
- Land owned by Restormel Borough Council
- Land leased by Restormel Borough Council from the Rashleigh Estate

ACCESS

- Surfaced road
- Unsurfaced footpath
- Car park

Excluded area

Playground

Picnic area

The southern boundary corresponds to the position of the varying high tide level

0 metres 200

N

2. PHYSICAL DESCRIPTION

The Par Beach site comprises the main beach of Par Sands and a brackish lagoon known as Polmear Lake, separated by a sand bar which extends the width of the site in an east-west direction. The bar supports a sand dune system.

The site lies on the Meadfoot Beds of the Lower Devonian. These beds are overlain by alluvium to the north of the sand dune system and overlain by sands to the south. The soils throughout the site are neutral to moderately acid (CSD, 1990).

The dune system is still accreting. The 1946 aerial photo shows dune vegetation extending only as far as the current access road, but it now extends 100-150m seaward of this. The high tide mark has moved about 100m seaward since 1969. This is unusual as most sandy coastlines have been retreating in the last 100 years (Doody 1985). The dune system forms an important flood defence, as low lying ground to the north was an arm of the sea before the sand bar formed at the end of the 18th century, and flooded regularly until the late 1970's.

Landward of the dune system is the lagoon. This is a brackish lagoon probably natural in origin (Little 1985). It was not present in 1870 and the 1946 aerial photo shows it only half of its current size. It is unique in Cornwall in having a substrate of coarse sand. Brackish lagoons generally revert to less biologically interesting freshwater lagoons, but the sluice at Par Beach which allows sea water to enter should prevent this (Little 1985). Observation suggests that only the highest tides are likely to enter the lagoon via the sluice.

3. BIOLOGICAL DESCRIPTION

3.1 Habitats

The distribution of habitats at Par Beach is shown on Map 3. Semi-natural habitats are sub-divided into vegetation communities using the standard National Vegetation Classification survey technique (Rodwell, 1989, 1991, 1992). The following habitats were recorded at the site.

Habitats and their vegetation communities	Area (ha)	
Broad-leaved woodland		1.64
W1 *Salix cinerea - Galium palustre* woodland	1.40	
Woodland fringe	0.11	
Woodland on island in lagoon	0.13	
Scrub		0.62
W23 *Ulex europaeus - Rubus fruticosus* scrub	0.62	
Swamp		2.96
S4 *Phragmites australis* swamp	2.96	
Unimproved grassland		0.51
MG5 *Centaurea nigra - Cynosurus cristatus* grassland	0.42	
MG1 *Arrhenatherum elatius* grassland	0.09	
Sand dune		7.70
SD4 *Elymus farctus* foredune	2.15	
SD6a *Ammophila arenaria dune*	0.25	
SD7/SD7a *Ammophila arenaria - Festuca rubra* semi-fixed dune	3.96	
SD8b *Festuca rubra - Galium verum* fixed dune	0.60	
Restored sand dune	0.74	
Open water		1.73
Running water		-
Cultivated/disturbed land	}	9.60
Built up areas	}	
Beach		6.50
TOTAL AREA		31.26 ha

The dune system demonstrates the expected succession from foredunes on very mobile sand (SD4) to fixed dunes with a stable soil structure (SD8b). The fixed dunes are being invaded by gorse scrub (W23) and this has happened since the 1940's, no scrub being visible on the 1946 aerial photo. Strandline communities just above the high tide line are absent probably due to frequent litter removal. The eastern end of the dunes was badly eroded in the past and is being restored. Foredunes are still absent from this area however.

The lagoon area demonstrates the succession from brackish lagoon to reedbed (S4) and then willow carr (W1). The brackish nature of the reedbed is shown by the presence of Sea Club-rush (*Scirpus*

maritimus). The 1988 aerial photograph shows that the reedbed has encroached significantly on the lagoon in the last six years.

The CTNC Sites Survey in 1980 recorded 0.6 ha of saltmarsh, but there are currently only tiny patches of saltmarsh along the stream. Possibly this is due to the diversion of the original tidal stream into a new straight channel.

Almost a third of the site is made up of artificial habitats, including roads, car parks and amenity grassland on the roadsides, playground and picnic site. The rubbish tip to the west has been covered in topsoil and partly reseeded. However one area of unimproved grassland (MG5) remains and Southern Marsh Orchid (*Dactylorhiza praetermizza*) is present. But ranker grassland (MG1) is developing here due to the lack of grazing or mowing.

3.2 **Flora**

Records were obtained from Cornwall Wildlife Trust files, the Cornish Biological Records Unit and Margetts and David (1981). 80 plant species have been recorded at the west end of Par Beach and 106 at the eastern end (CBRU).

Greek Sea-spurrey (*Spergularia bocconii*) is nationally rare and listed in the British Red Data Book. 50 plants were recorded by R Murphy in 1993 on the site of the old rubbish tip at SX 079533. It is only known from two other sites in Cornwall (Perring and Farrell 1983), and is probably an introduced species (Margetts and David 1981). Ray's Knotgrass (*Polygonum oxyspermum*), a species which until recently was considered nationally scarce but is now of only local importance, was recorded on the foredunes in 1994. Three other Red Data Book species Prostrate Toadflax (*Linaria supina*), Balm-leaved Figwort (*Scrophularia scorodonia*) and Isle of Man Cabbage (*Rhynchosinapsis monensis*) have been recorded on the nearby campsite and harbour, but not within the proposed LNR boundary.

The nationally scarce moss *Pottia wilsonii* has been recorded in the vicinity by J Paton prior to 1980 but its current status and location is unknown.

Two species are considered to be of county importance as they occur at 6 or less sites in Cornwall. Lesser Pondweed (*Potamogeton pusillus*) and Beaked Tasselweed (*Ruppia maritima*) have both been recorded from the lagoon.

The following species are not of county importance but they have a restricted distribution in Cornwall: Pale Toadflax (*Linaria repens*), Little Mouse-ear Chickweed (*Cerastium semidecandrum*), Saltmarsh Rush (*Juncus geradi*) and Hoary cress (*Cardaria draba*).

3.3 Fauna

Birds

The site is of county importance for the number of species of wintering and passage birds. Over 200 species have been recorded. The main focus of interest is the lagoon but the intertidal zone is also important. 100 Coot (*Fulica atra*) have been recorded wintering at the lagoon, a population of county importance. The reedbeds form an important roost for wagtails, hirundines and starlings. The nationally rare Cetti's warbler (*Cettia cetti*) which is listed in the British Red Data Book has been resident since 1988 and confirmed as breeding in 1990.

Invertebrates

26 species of butterfly have been recorded in the last ten years. Dragonflies and damselflies are uncommon around the lagoon presumably because of its brackish nature.

MAP 3. PAR BEACH MANAGEMENT PLAN
Existing state - habitats and vegetation communities

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HABITATS

- Broad-leaved woodland
- Scrub
- Unimproved grassland
- Swamp
- Sand dune
- Open water
- Running water
- Cultivated/disturbed land
- Beach
- Built up areas

VEGETATION COMMUNITIES

W1	*Salix cinerea - Galium palustre* woodland
W23	*Ulex europaeus - Rubus fruticosus* scrub
MG1	*Arrhenatherum elatius* grassland
MG5	*Cynosurus cristatus-Centaurea nigra* grassland
S4	*Phragmites australis* swamp
SD4	*Elymus farctus* foredune
SD6	*Ammophila arenaria* mobile dune
SD7	*Ammophila arenaria - Festuca rubra* semi-fixed dune
SD8	*Festuca rubra- Galium verum* fixed dune

Excluded area

Former domestic rubbish tip

Sluice

Woodland fringe

Restored sand dune

Litter storage area

0 metres 200

N

4. CULTURAL ASPECTS

The area is heavily used by local people and visitors from the adjacent campsite, with unrestricted access provision. Predictably the beach forms the main attraction with the lagoon of secondary importance.

5. EVALUATION

The nature conservation importance of the site is evaluated below using standard national criteria (Ratcliffe, 1977). In addition to its wildlife importance, the site is an important amenity area for both the local population and tourists on the adjacent camp site. Its location within easy reach of St Austell combined with parking, toilets and safe access give it high education potential.

Size

The extent of habitats or size of species populations at the site are not of national importance, although the increasing area of sand dune habitat is of conservation significance. The large population of wintering Coot is of county importance.

Diversity

Habitat diversity is high, representing the successional stages from foredune to fixed dune and brackish lagoon to woodland. Dune slack and strandline communities are absent. There is also a high diversity of plants and wintering and passage bird species.

Rarity

Brackish lagoons are rare nationally and this area is unique in Cornwall in having a sandy substrate. Sand dunes and reedbeds are relatively rare in Cornwall and the dune system unusual in that it is still growing. One nationally rare plant has been recorded from the site and one nationally scarce moss is present. Two plant species are rare in Cornwall and four species have a restricted distribution in the county. The nationally rare Cetti's warbler is known to breed at the site.

Typicalness

The succession of habitats from beach-dune-grassland-scrub, and open water-reedbed-willow carr, are typical of coastal sites in Britain, but not so typical of those occurring in Cornwall. The conflicts between conservation and recreation are typical of those found on a coastal site.

Fragility

The sand dunes are very fragile and are susceptible to erosion by trampling. Fixed dune, lagoon, reedbed and unimproved grassland habitats may be lost if succession to scrub and woodland is not controlled.

Naturalness

One third of site is artificial habitat. The sand dune system is being restored at the western end of the beach. The lagoon is of natural origin but is maintained in brackish state by a sluice (Little 1985). The island in the lagoon is of artificial origin. The former rubbish has been infilled and reseeded with a native grass seed mix. Japanese Knotweed (*Renoutria japonica*), an alien plant, is spreading at the west boundary.

Position in Ecological/Geographical Unit

Par Beach is one of a number of sandy beaches which are found along the south coast of Cornwall. Rocky cliffs lie to the east and west of the site and the coastal strip to the east is also designated a Cornwall Nature Conservation site of county importance (R3.2). To the south the Beach merges with the extensive intertidal zone.

Intrinsic Appeal

The sandy beach attracts high numbers of visitors in summer months from the adjacent caravan site, St Austell and the local area. However, the visual appeal of the site is diminished by the beach huts among the sand dunes and the nearby caravans and china clay works.

Potential Value

There are opportunities to enhance the existing nature conservation significance of the site through further habitat management and limitation of damage by visitors. There is a high potential for the provision of wildlife interpretation.

Recorded History

Habitats, higher plants, mosses, fungi, birds and invertebrates have been recorded at Par Beach in recent years. National Vegetation Classification communities were recorded in 1994.

Summary

Par Beach is an important local amenity area where, although one third of the habitats are artificial, important areas of semi-natural habitats unusual in Cornwall remain. There is ample justification for Local Nature Reserve status which requires only that the site has 'special local interest'.

IDENTIFICATION/CONFIRMATION OF IMPORTANT FEATURES

Feature	Conservation Importance		
	National	County	Local
Habitats			
Sand dune system		✓	
Brackish lagoon		✓	
Reedbed		✓	
Woodland			✓
Unimproved grassland			✓
Flowering Plants			
Greek Sea-spurrey *(Spergularia bocconii)*	✓		
Lesser Pondweed (*Potamogeton pusillus*)		✓	
Beaked Tasselweed (*Ruppia maritima*)		✓	
Ray's Knotgrass (*Polygonum oxyspermum*)			✓
Bryophytes			
Pottia wilsonii	✓		
Birds			
Cetti's Warbler (*Cettia cetti*)	✓		
Wintering and passage species diversity		✓	
Wintering coot		✓	
Roosting birds			✓
Amenity and Education use			✓

6. MANAGEMENT AND RATIONALE

The fate of the sand dune system ultimately depends on factors outside the site which affect the longshore drift of sand and its interception by the beach. Beach sand is then intercepted by dune vegetation forming the dunes. Little can be done about factors outside the site. On site it is important to minimise the amount of sand removed from the beach during litter removal and to maintain vegetation cover on the dunes. Recording the distances of the seaward edge of the dunes and the high tide line from the access road would form a simple method of monitoring the sand dunes system in the future.

The delicate foredunes are currently avoided by beach cleaning tractors, and little can probably be done to prevent human erosion. On the dunes proper, erosion relates mainly to human trampling, firstly across the dunes where people walk from the road to the beach, secondly around the beach huts, and thirdly along the top of the dunes where people walk the length of the site.

The problem with access to the beach is that there are numerous widely spaced crossing points related to several parking areas, the shop and the two roads from the campsite, making rationalisation very difficult. If localised areas of dune became badly eroded they could be temporarily fenced off to allow regeneration of the dune vegetation. Continued restoration of the eroded dunes near the main car park is important, particularly as the sea has breached the dunes here in recent years. However there is concern that the wooden fences used for dune restoration in the past represent a hazard to pedestrians when partially buried. Consideration could be given to the use of other sand trapping structures

Horse riding should ideally be prevented on the dunes where it is potentially damaging, but does not represent a problem on the beach. Cycling is currently prohibited on the dunes. Dogs do not represent a significant problem to wildlife. Vehicles are not explicitly prohibited from driving on to the beach via the road at the western end of the dunes, and have been seen driving over the foredunes. Consideration should be given to ways in which vehicular access could be restricted. The twenty five beach huts damage the dune vegetation directly and also indirectly by associated paths and where owners have dug out areas for sunbathing. Removal of the beach huts is a politically sensitive issue but numbers are certainly dwindling and provided no permission is given for new building the problem should gradually disappear. Owners should be asked not to remove dune vegetation to create sunbathing areas. There may be opportunities for extending the dune system landward by minimising the width of the mown verge used for car parking and the size of the picnic site.

The area of fixed dune grassland (SD8) is likely to lose its floristic diversity unless managed, with invasion by coarse grasses followed by the development of gorse scrub. This has to a large extent already happened. The gorse is currently cut on an eight year rotation which should be continued. A recently burnt area of gorse could conveniently be cut as the next stage of the rotation, as it is currently rather unsightly. The dune grassland is currently unmanaged. Grazing is used on many reserves but would be difficult at this site. Mowing between one and five times a year with removal of the cuttings has been tried on fixed dunes at Newborough Warren with a resultant increase in floristic diversity (Hewett 1985). At Par Beach such heavy mowing would be damaging to the butterfly populations, and a sensible compromise would be to mow the fixed dune grassland in late summer on a three year rotation, with removal of the cuttings. To ensure that this mowing regime is appropriate, populations of butterflies and other invertebrates should be monitored.

The lagoon, reedbed and willow complex will need careful management. The particularly valuable feature of the lagoon is its brackish nature, however unlike Swanpool at Falmouth, this lagoon has been very little studied. It is unclear how much salt reaches the lagoon via the sluice and how much by diffusion through the water table. It is said to be unique in Cornwall because of its sandy substrate but little is known about what invertebrates are dependent on this, though they are likely to be important (Kirby 1992). There is an urgent need for further study and it would perhaps form a good student research project. In the meantime it would be inappropriate to carry out any dredging in the lagoon or to make any changes to the sluice. Depth measurements taken from fixed points in a boat, with simultaneous recording of the water level from the existing water depth gauge, would determine whether wind blown sand is accumulating in the lagoon and hence whether dredging is necessary. Soil cores would determine the thickness of the sandy substrate prior to dredging.

In the absence of management, reedbed will encroach on the lagoon and as reed litter accumulates with consequent drying out, willow carr will invade. Currently a woodland margin screens the north, east and south-east boundaries and this should be retained to preserve sanctuary areas for wildlife. Patches of bramble around the margins of the reedbed should be retained for nesting Cetti's Warbler. The adjacent Caravan site is encroaching into the reedbed on the western shore and this should be checked in future years.

The south-west shore should have enough reed removed to allow the public to view the bird life whilst retaining a partial screen. An interpretation board showing the birds likely to be seen would be valuable here. The island should be retained as a sanctuary surrounded by open water, and the current ban on watersports and swimming maintained.

Three basic forms of management will be needed (Ward, 1991):

1. Summer reed cutting. This is particularly effective at slowing the rate of reed regrowth, particularly if the stems are cut below water level. It is therefore the best management for areas where the eventual aim is to eliminate, or control the spread of, reed. Cutting in late August would avoid disturbing nesting birds. If cut in August or September, evenings should be avoided so that roosting birds are not disturbed. Although summer cutting will inevitably occur in the tourist season, cutting later from September onwards is likely to be much less effective at controlling reed regrowth. Therefore it may be necessary to cut reed during the tourist season, although this should not be necessary every year. Cutting should leave an indented edge to the reedbed to maximise the length of the valuable reed/water interface.

2. Winter reed cutting in areas where wet reedbed is to be maintained and succession to scrub prevented. This could only be done in areas that were dry enough in winter to allow access. This would be on a rotational basis and rotations between 1 and 15 years have been used elsewhere. The ideal rotation is as long as possible without cutting becoming very difficult due to scrub regrowth, this would have to be determined by experience. Cutting should be between November and February to minimise disturbance to reedbed birds.

3. Scrub clearance of willow in areas where it is already invading. Unlike (2) this management will not prevent the reedbed drying out eventually and later reed cutting would be necessary. Again an indented woodland edge should be created.

In all three cases all cut material would need to be removed. Alternatively reed could be put into piles. Aerial photographs would be the simplest way of monitoring the effectiveness of reed and scrub clearance work.

On the old rubbish tip Japanese Knotweed (*Reynoutria japonica*) needs control by summer spraying with Glyphosate. The population of Greek Sea-spurrey (*Spergularia bocconii*) needs counting regularly and the area south of the track where it is more prevalent needs maintaining in an open condition, currently it is annually swiped. The area of MG5 grassland north of the track will lose its floristic value unless managed. Mowing with removal of cuttings in July and September would achieve this (Rodwell 1992), but a single cut in August would be better for butterflies.

There is potential for more on-site interpretation. Interpretation boards would be valuable in the main car park and near the lagoon. In addition, an information leaflet could be provided which could be sold by the car park attendant and possibly at the campsite reception. The education

potential should be explored. Unfortunately pond-dipping may prove rather uninteresting here due to the brackish nature of the lagoon.

Voluntary wardens have been recruited at Bude Marshes Local Nature Reserve and will also be used when Swanpool becomes a Local Nature Reserve. They could provide an on-site presence with a valuable role in public relations, policing and monitoring at Par Beach.

6.1 Operational Objectives and Outline Prescriptions

Operational Objectives (long term aims) are listed in groups below. Some have been further subdivided into Outline Prescriptions (medium term aims). These are listed below the corresponding Operational Objectives and are displaced to the right. The projects required to achieve the Operational Objectives are listed in Section 6.2.

Conservation Management

Maintain, extend and enhance the current range of semi-natural habitats and physical features.

- Control succession in the lagoon, reedbed, fixed dune and unimproved grassland habitats
- Maintain the brackish nature and sandy substrate of the lagoon
- Seek opportunities for the restoration of artificial habitats to semi-natural habitats

Maintain and enhance populations of rare species

Education, Amenity and Access

Maintain and enhance area as a local recreational and educational resource, provided this does not substantially damage the natural features.

- Provide interpretative facilities
- Ensure the safety of visiting public and educational groups
- Involve local people in the care and management of the site

Minimise the damaging impact of public use.

- Allow free pedestrian access, but ban horses, cyclists and vehicles from the dunes
- Consider use of temporary exclosures if severe local dune erosion becomes apparent.
- Do not allow watersports on the lagoon
- Maintain screened sanctuary areas in the reedbed and lagoon
- Restore dune vegetation if necessary

Research and Monitoring

Monitor and research those factors which will influence site management.

- Monitor the following:
  - The distribution and abundance of rare species
  - The boundaries of the lagoon, reedbed and woodland

- The position of the seaward edge of dunes and high tide mark
- The siltation rate and water depth in the lagoon
- The invertebrate populations in the lagoon
- The response of the fixed dune area to management
- The impact of public use on the natural systems of the site

Legal and Administrative
Obtain funding for site management
Review management plan at regular intervals

6.2 **Project Register and Descriptions**

The projects required to achieve the Operational Objectives in Section 6.1 are listed here. They are each given a code number which is used to identify some of them on Map 4.

Conservation Management

1.1 Erect further sand trapping structures on eroded dunes. Plant marram only if natural regeneration inadequate
1.2 Cut gorse scrub in winter on an 8 year rotation and remove cuttings. Start with burnt area.
1.3 Mow fixed dune grassland in August/September on a three year rotation and remove cuttings
1.4 Confirm the location of the rare moss *Pottia wilsonii* and if necessary modify management
1.5 Continue current management regime with sluice
1.6 Uproot or cut reed in late summer in areas where reedbed is to be reduced, and remove cuttings. Leave an indented edge to the reedbed
1.7 Cut reed in winter in areas where reedbed is to be maintained, where access possible, on an eight year rotation. Remove or stack cuttings
1.8 Cut willow and remove cuttings. Leave an indented edge to the woodland
1.9 Control Japanese knotweed by summer treatment with Glyphosate
1.10 Swipe area containing *Spergularia bocconii* annually, avoiding the flowering period from May to September
1.11 Mow area of MG5 grassland in August with removal of cuttings

Education, Amenity and Access

2.1 Remove beach litter whilst avoiding damaging delicate foredunes. Minimise the amount of sand removed during litter collection
2.2 Patrol reserve regularly
2.3 If localised areas of dune are badly eroded, erect temporary fences to reduce public use, and allow dune vegetation to regenerate
2.4 Liaise with beach hut owners asking them not to remove

dune vegetation around huts to create sunbathing areas

2.5 Mow existing roadside verges and picnic site to maintain a short sward, but seek opportunities to allow dune vegetation to regenerate

2.6 Prepare and erect vandal proof interpretative boards for the main car park and near the lagoon

2.7 Prepare interpretative leaflet for the Local Nature Reserve and the wider area for sale by car park attendant and possibly the camp site staff

Research and Monitoring

3.1 Determine the extent of the lagoon, reedbed and woodland from aerial photographs

3.2 Monitor siltation rate in lagoon by a series of depth measurements from fixed points in a boat, with simultaneous recording of the water level. Consider dredging if rapid siltation apparent but take soil cores first to determine the depth of the sandy substrate

3.3 Initiate research project into ecology and hydrology of brackish lagoon, particularly to survey and monitor invertebrate populations in relation to dredging

3.4 Collate bird and butterfly records for site

3.5 Monitor populations of butterflies and other invertebrates in the fixed dune grassland to assess mowing regime

3.6 Monitor the population of *Spergularia bocconii*

3.7 Monitor impact of trampling on sand dunes and consider action if damage becomes more extensive

Legal and Administrative

4.1 Appoint locally based voluntary wardens

4.2 Apply for outside funding for site, particularly from English Nature's conservation grant funds

4.3 Review the management plan after five years