



1. INTRODUCTION

1.1 Background

Swanpool Local Nature Reserve is a brackish freshwater lake which lies on the western edge of Falmouth in west Cornwall at grid reference SW 802 315 (*Map 1*).

The nature conservation value of Swanpool has been known for many years. It was designated a County Wildlife Site (Swanvale Cornwall Nature Conservation Site C/3.5) by the Cornwall Wildlife Trust.

In 1995 the site was recognised as being of national conservation importance and designated a Site of Special Scientific Interest (SSSI) by English Nature (*Appendix 1*). Later in the same year Swanpool was designated a Local Nature Reserve (LNR) by Carrick District Council and English Nature.

In 1993, Carrick District Council commissioned the Environmental Consultants (CTNC) Ltd, the trading company of the Cornwall Wildlife Trust, to prepare a five year management plan for the part of Swanpool which lies within its ownership (Gowenlock, 1994). As this plan has now expired, Carrick District Council commissioned a management plan in 2000 to cover the next five year period. The plan aimed to include the land within the boundary of the Local Nature Reserve, which is owned by both Carrick District Council and the Cornwall Wildlife Trust.

1.2 Site details

1.2.1 Location

Name:	Swanpool
County:	Cornwall
District:	Carrick
Parish:	Falmouth
Grid reference:	SW 802 315
Area of LNR:	8.64ha
Local planning authority:	Carrick District Council
Conservation status:	Site of Special Scientific Interest County Wildlife Site (CK/3.5) Local Nature Reserve Cornwall Wildlife Trust Nature Reserve

1.2.2 Maps

1 : 50,000	Sheet 204 Truro and Falmouth
1 : 25,000	Sheet 105 Falmouth and Mevagissey
1 : 10,000	SW 83 SW
1 : 2,500	SW 8031
1 : 1,250	SW 8031 NW; SW 8031 SW

1.2.3 Land tenure

The majority of the Swanpool Local Nature Reserve is owned freehold by Carrick District Council. Cornwall Wildlife Trust owns the north-west section of the LNR, known as the Swanvale nature reserve. Part of Carrick District Council's land is leased to Mr Peter Lochrie of Tannery Cottage, Church Hill, Penryn.

1.3 Land use planning

1.3.1 Carrick District-Wide Local Plan

Swanpool Local Nature Reserve is covered by a number of land use designations under the adopted Carrick District-Wide Local Plan 1998 (*Table 1*). These seek to protect its role and value as both an important site for nature conservation and public amenity.

As well as a designated Local Nature Reserve, Swanpool is also a Site of Special Scientific Interest, a County Wildlife Site and forms part of the Coastal Zone. It also forms part of the Swan Valley, designated as an area with the potential for improving as a recreational and amenity area.

The following table provides a summary of the relevant land use policies contained within the adopted Carrick District-Wide Local Plan 1998. The full text for these policies can be found in *Appendix 2*. It should be noted that this local plan is currently under review, with a first deposit anticipated in December 2001.

Table 1. Summary of relevant land-use policies for Swanpool LNR

<i>Policy Ref.</i>	<i>Policy Summary</i>
3G	Protects Sites of Special Scientific Interest from the direct and indirect impact of development proposals.
3H	Protects Local Nature Reserves from the direct and indirect impact of development proposals.
3J	Seeks to avoid damage to locally important habitats.
3K	Seeks to avoid damage to protected species or their habitats.
3L	Protects the coastal zone from inappropriate development.
10F	Seeks to create a walkway and open space along the Swan Valley and protect this area from conflicting development.

1.3.2 Replacement Structure Plan

The county-wide Replacement Structure Plan 1997 provides an overall environmental policy that addresses natural and semi-natural habitats, seeking to protect them from significant disturbance or damage by development. *Appendix 3* provides the full text of Structure Plan Policy ENV 5.

1.3.3 National Policy Guidance

Government Policy (PPG 9) (1994) 'Nature Conservation' emphasises the importance of the planning process in helping provide protection for areas of nature conservation value, both through the development plan and the development control process. The PPG gives development control criteria for SSSIs and advice on Local Nature Reserves.

1.3.4 Non Statutory Management Plans

The Swanpool site lies within the wider Fal catchment area and the adjacent Fal Estuary. As such, the management plan for the LNR should reflect the recommendations outline in the non-statutory strategic management plans that have been prepared for the wider area. These include the Fal and St Austell Streams Local Environment Agency Plan (EA 1997), the Rame Head to Lizard Shoreline Management Plan (Halcrow 1999), the Fal Bay and Estuaries Initiative (1996), the Start Point to Lands End Nation Area Profile (EN 1997) and the Falmouth Oil Spill Prevention Plan (FOIL).

2. PHYSICAL DESCRIPTION

This chapter describes the physical condition of the site, in terms of its geology, geomorphology and hydrology.

2.1 Geology

Swanpool lies on alluvium underlain by sandstone and shales of the Falmouth and Mylor Series of Devonian age.

2.2 Geomorphology

The Swan Valley appeared as an arm of the sea in the last interglacial, but at the end of the last Ice Age offshore deposits created a sand and shingle bar across its mouth, forming a lagoon. This bar is, and was, 5m above ordnance datum, as was the water level in the lagoon. Thus the lagoon boundaries followed the 5m contour, and so it would have been about three times as large as today, covering the present day Swanvale and much of the Swan Valley. As the shingle bar was higher than the spring tides, the lagoon was of freshwater (Little *et al*, 1973).

Two major changes occurred in 1826 with the construction of the 'outlet culvert' from Swanpool through the shingle bar to Swanpool Beach. It was at 2.15m above ordnance datum. Firstly the lagoon water level was immediately reduced to the level of the outlet culvert with a resultant contraction of the lagoon boundaries. The 1880 1:2,500 map shows Swanvale as 'wetland' instead of open water.

Secondly Swanpool became brackish. After using a correction factor of 2.91m from the Admiralty Tide Tables for the difference between ordnance datum and chart datum at Falmouth, Falmouth tide Tables reveal that spring high tides on average rise 25cm above the level of the culvert, although neap high tides remain 88cm below it. Thus seawater could enter Swanpool on spring high tides making it brackish. Subsequent further decreases in the area of open water at Swanpool occurred due to road construction across the north west corner between 1880 and 1907, the infilling of the southern end to form a car park in the 1960's, and ecological succession around the edges (see next chapter).

2.3 Hydrology

A series of detailed ecological studies in the 1970's describe the hydrology of Swanpool (see *Map 3*). Mean water depth is 1.6m with a maximum of 3m in the south east corner meaning that Swanpool holds about 80,000m³ of water (Barnes *et al*, 1971).

Freshwater input amounts to 20-30 times this volume per year so there is a relatively rapid throughput of water (Davey, *et al* 1973). This comes predominantly from the Tregonnigie Stream with a much smaller flow from the 'seepage stream' both of which enter Swanpool via Swanvale (*Map 3*). Tregonnigie Stream runs from about 2.5km to the north west, but the seepage stream arises from two springs in Swanvale. After heavy rain three storm drains also enter Swanpool, one draining

the built up area to the north, one the road to the south west and others the road and cemetery to the east (Barnes *et al*, 1971).

Seawater enters via the 'outlet culvert' and amounts to two times the pool volume per year (Dorey *et al*, 1973). This occurs only on spring high tides, and on average 8-9 consecutive tides enter in a row. This increases in March and September when spring tides are higher, and conversely in mid summer and mid winter little seawater enters (Barnes *et al*, 1971). In spite of the high throughput of freshwater, seawater is retained in the lagoon as follows. There is a marked halocline at about 1.5-2m depth, a zone of water which separates the lower hypolimnion with a chloridity (a measure of salinity) of 6.5-10% CI, from the upper epilimnion with a much lower chloridity of 0.2-4% CI (Barnes *et al*, 1971). Seawater entering Swanpool immediately sinks to the hypolimnion but when flow is reversed it is the less saline epilimnion that escapes to the sea, thus retaining seawater in the pool. Winter winds may cause mixing of the two layers and at these times more salt is lost (Dorey *et al*, 1973).

Given that seawater has a chloridity of 19.4% CI, the epilimnion is only slightly brackish, and indeed the reedbeds only have a chloridity of 0.3-2.1% CI (Barnes *et al*, 1973). It is important to realise that the degree of brackishness varies in different parts of Swanpool creating a range of ecological conditions. Natural brackish lagoons usually evolve to become freshwater lagoons, but the outlet culvert at Swanpool will prevent this happening (Little, 1985).

Unfortunately all the above research was done before 1983. In this year, the freshwater input into the lagoon was increased when South West Water diverted the run-off from 350 new homes at Golden Bank into the centre of the west bank of Swanpool. At the same time the geometry and level of the outlet culvert were altered slightly, giving rise to increased salinity in the lagoon. The effects of these events on the hydrology of Swanpool have not been assessed (Little, 1985).

The catchment for Swanpool covers approximately 3.5km² mainly to the north west. It was almost entirely agricultural on the 1:2,500 OS maps of 1880 and 1907, and predominately so on the aerial photo of 1946. The majority is now urban being mainly residential development together with an oil storage depot, Tregonigie Industrial Estate and a railway line. Immediately to the east of Swanpool is a large cemetery. Just to the west about 7 ha of green fields have planning permission for housing development.

Water quality measurements for 1993/1994 (NRA) indicate that the Pool is eutrophic with high levels of nitrate and phosphate but that suspended solids are low.

3. BIOLOGICAL DESCRIPTION

This chapter describes the biological condition of the Local Nature Reserve in terms of the habitats and species present.

3.1 Habitats

All the semi-natural habitats at Swanpool and Swanvale represent successional stages from the pre 1826 freshwater lagoon (Little *et al*, 1973). According to the 1907 OS 1:2,500 map Swanvale, the north west and south west corners, and the edges of Swanpool were 'marsh'. According to the 1946 aerial photographs further encroachment had occurred leaving an area of open water very similar to that present today. No woodland is shown in Swanpool or Swanvale on the 1907 map but a large proportion of the marsh has succeeded to woodland since then, and there is now much more woodland than in 1946.

Past surveys indicate that there are three main habitat types within the Local Nature Reserve open water, swamp and broad-leaved woodland (Gowenlock, 1994). These are listed in *Table 2* and their distribution within the site is shown on *Map 4*.

Table 2. Habitats recorded within the LNR

Habitat Type	Area (Hectares)
Open water	4.41
Swamp dominated by common reed	0.45
Broad-leaved woodland dominated by willow carr	3.68
Artificial habitats	0.10

3.1.1 Open water

Swanpool is a brackish lake with no floating vascular aquatic vegetation. Nutrients for algal growth are abundant and in summer the water is eutrophic, resulting in a low phytoplankton diversity (Crawford *et al*, 1973). The hypolimnion becomes anoxic in the summer (Dorey *et al*, 1973).

Saline lagoons are a habitat type of international and national conservation importance. They are included on Annex I of the EC Habitats Directive (CEC, 1992) and the list of national priority habitats under the Biodiversity Action Plans (UKBSG, 1995). They are also of regional and county nature conservation importance (Cordrey, 1996; Cornwall Biodiversity Initiative, 1997).

3.1.2 Reedbed

This habitat type is dominated by common reed (*Phragmites australis*), growing up to 3m tall. Associated species include yellow flag (*Iris pseudacoras*), greater tussock sedge (*Carex paniculata*) and sea club-rush (*Scirpus maritimus*). The presence of sea club-rush indicates the brackish conditions in the marsh. In recent years the reed bed has been managed by trimming the reeds annually along the roadside margins in consultation with English Nature.

Reedbeds are of national conservation importance, included on the national priority habitat list of the Biodiversity Action Plans (UKBSG, 1995). They are also of regional and county importance, covering only 600 ha of South West and 150 ha of Cornwall (Cordery, 1996; CBI, 1997).

3.1.3 Broad-leaved woodland

This habitat type is dominated by grey willow (*Salix cinerea*) up to 7m high, with occasional alder (*Alnus glutinosa*). Many of the alders are dying, possibly due to the disease 'alder dieback'. In the drier areas ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*) predominate.

In the wetter areas there is a typical cornish willow carr ground flora with species such as yellow flag (*Iris pseudacorus*), greater tussock sedge, water mint (*Mentha aquatica*), gipsywort (*Lycopus europaeus*), soft rush (*Juncus effusus*), marsh forget-me-not (*Myosotis secunda*), lady's smock (*Cardamine pratensis*), wavy bittercress (*Cardamine flexuosa*), remote sedge (*Carex remota*), and fleabane (*Pulicaria dysenterica*).

Wet woodlands are a habitat type of national conservation importance, listed as a priority habitat under the Biodiversity Action Plans (UKBSG, 1995). They are also of county importance and included in the Cornwall Wetlands Habitat Action Plan (CBI, 1998)

3.1.4 Artificial habitats

A tarmaced road and small pump house are located at the north-west end of the Reserve.

3.2 **Species**

3.2.1 Flora

Records of plants were obtained from the Environmental Records Centre for Cornwall and the Isles of Scilly, based at the Cornwall Wildlife Trust.

129 species of flowering plant and fern have been recorded at Swanpool. However, some 50 of these are common plants of dry habitats, presumably being recorded on the edges of the area where it grades into surrounding drier habitats. Mosses and liverworts are of low diversity but there are some rarities.

One nationally rare plant, occurring in only 15 or fewer 10km squares of the national grid, has been recorded at Swanpool, and four nationally scarce plants, occurring in 16-100 10km squares. This species are listed in *Table 3*.

There is an old record for the nationally rare sea knotgrass (*Polygonum maritimum*) at Swanpool. However, the plant has not been recorded since 1887 and is likely to have been on the adjacent beach. One plant of county importance has been recorded at the site: fennel pondweed (*Potamogeton pectinatus*) (Spalding *et al*, 1997).

Table 3. Nationally important plants recorded from Swanpool

Species	Status	Last Date Recorde	Recorder
<u>Flowering Plants</u> Cornish moneywort (<i>Sibthorpia europaea</i>) Spiral tasselweed (<i>Ruppia cirrhosa</i>)	Nationally scarce Nationally scarce	1973 1951	C Little R W David
<u>Liverworts</u> <i>Fossombronia husnotii</i> var. <i>anglica</i> <i>Riccia crozalsii</i>	Nationally scarce Nationally scarce	1960-67 1960-67	J Paton J Paton
<u>Mosses</u> <i>Fissidens algarvicus</i>	Nationally rare	1960-67	J Paton

Alien Species

A number of non-native plants have been recorded at Swanpool, probably due to the dumping of garden waste. Although not desirable in the Reserve, most species are not invasive and do not pose a threat to the native flora. However, Japanese knotweed, which is found in the drier areas of woodland on the east side of the Reserve, is an exception. This pest species is included on Schedule 9 of the Wildlife and Countryside Act 1981, making it an offence to cause the plant to spread.

3.2.2 Fauna

Invertebrates

Swanpool is the only known British site for the Bryozoan trembling sea-mat (*Victorella pavida*). This species is nationally rare and legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (HM Government, 1981; 1988). It is also included on English Nature's 'Species Recovery Programme' (Whitten, 1990).

The trembling sea-mat lives in saline or brackish lagoon conditions and is tolerant of low and fluctuating salinity. It was first recorded at the Victoria Docks in London and the Surrey Canal in 1870, but has long since disappeared from these locations. In 1968 the trembling sea-mat was rediscovered at Swanpool and this site is now the only British location for the species.

In 1968 the species was found in the 'outlet culvert' of the lagoon but it has since spread into the pool proper in subsequent summers when salinity and temperature were increased. In 1985, after the hydrological changes of 1983 (see section 3.1), the species was abundant at both ends of the pool. At this time the salinity was the highest ever recorded at Swanpool, at 3.1% S on the surface and 25% S at the bottom (seawater = 35% S).

Recent surveys by English Nature in 1994 and 1997 found that the trembling sea-mat occurs around the margins of the entire pool, preferring the submerged stems of common reed (*Phragmites australis*) and concrete and stone surfaces (Gainey, 1997). A copy of the 1997 report is presented in *Appendix 4*.

Submerged invertebrate diversity is low at Swanpool with only 6-7 permanent species but this is typical of brackish conditions (Barnes *et al*, 1971). Characteristic brackish lagoon species have been recorded, including *Gammarus chevreuxi*, *Palaemonetes varians* and *Neomysis vulgaris* (EN, 1995).

Birds

The BTO Sites Register of 1979 identified Swanpool to be of county importance for wintering and passage birds, with 103 species recorded. 120 species have been recorded in the Swanpool area by the Cornwall Wildlife Trusts' Reserves Ranger (Stuart Hutchings, pers. comm.).

A pair of resident swans command the lake, but there may be cygnets present or even swans from other areas in Cornwall, for example the Fal Estuary, especially during times of poor weather when they seek more sheltered conditions.

A small flock of tufted duck spend several months of the winter on the lake. The mallard is present at the pool all year round. Coots, moorhen and little grebe are regular visitors to the pool throughout the year. Kingfishers and water rail have also been sighted at the pool, along with small flocks of siskin.

4. CULTURAL ASPECTS

Swanpool is located within the Swan Valley, an area identified in the Carrick District-Wide Local Plan as an area with potential as a recreational and amenity area (CDC, 1998).

Swanpool lies within a residential area and is surrounded on two sides by housing. A primary school is also located close by. Access to the LNR is excellent : roads lie along the eastern and western boundaries and there is pedestrian access all the way around the lagoon. The Reserve lies close to Swanpool Beach and its associated car park, crazy golf course and beach café. The site is also linked to a continuous walk from Bickland Road to Gyllyngvase Beach.

During 1852 a lead mine was opened behind Swanpool beach. A long tunnel was constructed leading to Pennance Point, where there was a tall chimney stack to remove toxic arsenic fumes. A second tunnel and chimney were later constructed for better ventilation. The mine was locally know as 'Wheal Swamp-All' and Pennance Pont as 'The Stack', a name still used for this area. The mine as closed in 1860 due to high running costs, and all that remains today is the lower part of one of the chimneys and part of the tunnel, found beside the footpath along the headland.

Due to its location and easy access, Swanpool is used extensively by local residents and visitors. In the summer months the lagoon is also used by the Falmouth Model Boat Club to race radio controlled boats. A small boathouse lies at the southern end of Swanpool.

Swimming and fishing are **not** advisable within the pool. This is because of its nature conservation interest and the occurrence of algal blooms.

5. ECOLOGICAL EVALUATION

This Chapter evaluates the nature conservation interest of Swanpool LNR using the criteria set out in *The Wildlife Sites Handbook* (The Wildlife Trusts, 1997), and considers its importance in a wider context.

5.1 Criteria for evaluation

5.1.1 Primary criteria

Diversity

The Reserve contains only three main habitat types but these include all the successional stages from open water to dry land.

As expected for a brackish, relatively eutrophic lagoon, algal and invertebrate diversity is low. Of the 129 species of flowering plant and fern recorded at Swanpool, about 50 are common species invading from the surrounding drier habitats. Bird diversity is however fairly high.

Rarity

The saline lagoon at Swanpool is of international, national and county nature conservation importance because this habitat is increasingly rare and threatened. In Britain, saline lagoons cover only 1300 ha (UKBSG, 1995). Ecologically Swanpool has been classified as one of the eleven most important saline lagoons in Britain (Davidson *et al*, 1991). Wet woodland and reedbed are habitats of national conservation concern, but at Swanpool they cover only relatively small areas.

The LNR supports several nationally important species, including the trembling sea-mat and five flowering plants and bryophytes. An assessment of the population of the trembling sea-mat in 1997 found that the species is 'abundant' on the submerged stems of common reed, 'common' to 'occasional' on submerged stone and 'abundant' and 'common' on other solid substrata (concrete, tree stumps etc.) (Gainey, 1997).

Naturalness and Typicalness

Although the lagoon was formed naturally, its brackish state is maintained artificially by the culvert. The water quality is affected by pollutants from the catchment area.

Size

Even though there is only 4.4 ha of open water, Swanpool is the largest naturally formed saline lagoon in Cornwall (Little, 1985). Indeed most British saline lagoons are under 10 ha (Davidson *et al*, 1991).

5.1.2 Secondary criteria

Position in ecological/geographical unit

Swanpool lies within the Swanvale valley and its catchment area. The site forms part of a continuous stretch of willow carr along the valley bottom.

Potential value

The LNR offers considerable potential for wildlife education to the general public and educational groups. It also has potential for habitat improvement by minimising disturbance and pollution.

Fragility

The brackish lagoon and the population of the trembling sea-mat are very fragile, being affected by changes in water quality and salinity. Pollution from various sources could potentially threaten the Reserve. These include: increased siltation after heavy rainfall and construction work at the housing development sites in the Swanvale catchment, traces of oil, paint and detergents in the Tregonnie Stream, possibly from industrial estates upstream, and oil residues from the storm drains on the main road on the east side of the lagoon (Gainey, 1997). Other pollution sources can be from domestic sources such as detergents and oils.

Changes to the levels of freshwater input from the catchment area and salt water input from the sea will affect the nature of the lagoon and its associated species.

The reedbed is susceptible to invasion by woodland and could potentially be lost if the process of natural succession is left to continue.

Educational/social value

The LNR is of considerable educational and social value. Its close proximity to Falmouth and easy access encourage local residents and visitors to use the site extensively.

Table 4. Summary of important features

Site feature	Importance			
	International	National	Regional	County
Habitats				
Open water	✓①	✓②	✓③	✓④
Reedbed		✓②	✓③	✓④
Broad-leaved woodland		✓②		
Species				
Trembling sea-mat		✓⑤⑥	✓③	✓④
Cornish moneywort		✓⑦		
Spiral tasselweed		✓⑦		
<i>Fossombronia husnotii</i> var. <i>anglica</i>		✓⑦		
<i>Riccia crozalsii</i>		✓⑦		
<i>Fissidens algarvicus</i>		✓⑥		
Source				
① EC Habitats Directive ② National BAP priority habitat ③ Regional biodiversity plan ④ Cornwall biodiversity plan		⑤ Wildlife & Countryside Act 1981 ⑥ Nationally rare ⑦ Nationally scarce		

5.2 Comparison of Swanpool in 1994 and 2000

Carrick District Council commissioned a management plan for the section of Swanpool within their ownership in 1994. The plan recommended a number of projects to improve and enhance the nature conservation interest of the lagoon and its surrounds, many of which were implemented between 1994 and 2000.

Carrick District Council has prepared a Progress Report which is provided in *Appendix 5*. The main areas of progress lie in the implementation of appropriate habitat management, a baseline survey on the trembling sea-mat and increased involvement with the local community. Interpretive materials such as a leaflet and information board have also been produced over the last few years. There has been a significant amount of press attention during this time, both locally and nationally, particularly during publicity events held by the Cornwall Wildlife Trust such as the Terrapin day.

5.3 The site in wider perspective and implications for management

Swanpool contains elements of international, national, regional and local importance and has been designated a SSSI, County Wildlife Site and Local Nature Reserve.

The management of the LNR should also take into account its close proximity to the Fal-Helford candidate Special Area of Conservation (cSAC), a site of international conservation importance, which covers the intertidal and subtidal areas of Fal and Helford Estuaries. Management plan will be established on marine SACs under the EC Habitats Directive. English Nature issued advice in January

2000 give under Regulations 33 (2) of the Conservation (Natural Habitats &c.) Regulations 1994 for the Fal and Helford European marine site.

Management of the Reserve should also be guided by the Biodiversity Action Plans (BAPs), which aim to co-ordinate the conservation of habitats and species, both nationally and regionally (UK Biodiversity Steering Group, 1995, 1998, 1999; Cornwall Biodiversity Initiative, 1997).

Saline lagoons, reedbeds and wet woodlands, all of which occur within the LNR, are all national priority habitats and therefore covered by national BAPs (*Appendix 6*). It should be borne in mind, that future surveys may find that some of the species recorded at Swanpool are covered by national or county species action plans such as the Species Action Plan for the Trembling Sea-Mat (Gainey, 1997).

6. MANAGEMENT OBJECTIVES AND RATIONALE

6.1 Vision Statement

Swanpool LNR should be managed primarily to conserve its brackish lagoon and population of trembling sea-mat, and also to provide a recreational and educational resource.

6.2 Objectives

1. Conserve the brackish lagoon and associated habitats
2. Maintain and enhance the population of the trembling sea-mat and other important species
3. Promote the educational and recreational use of the Reserve, ensuring compatibility with nature conservation.
4. Manage the Reserve effectively through the aegis of the Swanpool LNR Management Forum and the Swanpool Management Plan.

6.3 Rationale

Objective 1

Conserve the brackish lagoon and associated habitats

The brackish nature of the lagoon at Swanpool is an internationally and nationally important habitat due to its increasing decline in Europe and Britain.

The brackish conditions should be conserved by maintaining the correct balance between salt and fresh water. It is important that the shingle bar and outlet culvert are maintained. In the longer term sea level rise with global warming may increase sea water inputs to the lagoon, and changes in freshwater inputs must be carefully assessed. A priority is to assess the current salinity regime at Swanpool as this has not been assessed since the hydrological changes of 1983. A detailed hydrological survey of the lagoon is required.

Pollution is a major problem in all saline lagoons (Davidson *et al*, 1991). Various sources of pollution have been identified in the Swanvale catchment area. It is therefore important that water quality measurements by the Environment Agency are continued and action taken if these indicate a problem. Local residents and businesses should be made aware of the importance of maintaining water quality in the catchment.

The area of open water has altered little since 1945 and the area should be monitored to ensure it is not diminishing. The most effective method of monitoring this is by comparing aerial photographs. Cornwall County Council last took a series of aerial photographs in 1995 (*Appendix 7*). These should be compared with more recent photographs as they become available.

In contrast, the area of reedbed has however decreased markedly since 1945 due to succession to woodland. It is important that the area of reedbed is retained through regular scrub clearance. The extent of reedbed and woodland should be monitored using aerial photographs. However, as it is not known when the next series of aerial photographs will become available, it is recommended that a programme of fixed point photography is implemented simultaneously.

Japanese knotweed is found at several locations in the LNR. Although some areas have been sprayed, the plant is still present. It is recommended that a more thorough spraying programme is implemented, according to the Environment Agency's latest guidelines. The extent of the plant should be monitored annually to ensure that the spraying programme is effective.

Garden escapes, such as hydrangea and montbretia, are less invasive than Japanese knotweed, but it is recommended that they are gradually removed from the Reserve.

The dead alders were coppiced in late 1993. Monitoring of the stumps found that regeneration is poor. It is recommended that grey willow (*Salix cinerea*) is planted to fill the gaps in the tree line.

Objective 2

Maintain and enhance the population of the trembling sea-mat and other important species

The trembling sea mat is a nationally important species and its conservation is a priority. The species is found on the submerged stems of common reed and on concrete and stone surfaces and requires good water quality. Thus it is important to minimise levels of silt and pollutants as described above. Whilst brackish water is thought to be important for the trembling sea-mat, there is no information on how brackish the water should be. It is therefore important to research this factor to ensure that the population is conserved at Swanpool. The population of the trembling sea-mat should be monitored to ensure that it is being maintained or enhanced.

Several nationally important vascular plants and bryophytes have been recorded in the past at Swanpool. It is recommended that detailed botanical surveys are undertaken to determine whether these species are still present and to identify their precise locations.

Swanpool attracts diverse populations of wintering, breeding and passage birds. It is recommended that these birds are monitored as an indicator of the overall 'health' of the LNR.

Objective 3

Promote the educational and recreational use of the Reserve, ensuring compatibility with nature conservation.

Swanpool lies on the fringe of an urban area and is surrounded on three sides by housing. The site is therefore very important as a local recreational resource. Interpretation boards are now installed at the northern and southern ends of the reserve and leaflets describing the conservation importance of the site are available from the car park and nearby beach café. The LNR should continue to be publicised through the media.

Public safety is important. Buoyancy aids and warnings about the health risks of blue/green algae are already present. Signs should also be installed to prohibit fishing and swimming. Road signs to Swanpool should indicate that the site is a LNR and that the lagoon is no longer a “Boating Lake”. Paths around the lagoon are well-used but some repairs are needed to the tarmaced path near the car park and to some undercut banks along the east side. Efforts should continue to be made to keep litter under control.

The southern end of Swanpool is used by Falmouth Model Boat Club and a small hut has been constructed close to the car park. There is a general presumption against other recreational watersports at Swanpool as these are likely to disturb birds.

Involvement with the local community is important part of managing the LNR. The Swanpool Management Group, made up of conservation and planning organisations, local residents and users was set up in 1995 to discuss management issues (*Appendix 8*). This Group should arrange to meet at least twice a year to discuss the any changes to the management plan and the annual work programme.

Some local residents including members of the Swanpool and Gyllyngvase Residents Association act as volunteer wardens at Swanpool LNR. Their role has been guided by the Cornwall Wildlife Trust in accordance with their “Nature Reserve Voluntary Warden Guidelines” (*Appendix 9*). Volunteer wardens have an important role in monitoring the ecological condition of the Reserve. A group of junior wardens could also be recruited from local schools.

Liaison with local residents and visitors is an important part of managing the LNR. Contact should be maintained through an annual newsletter, the website and an information board.

Objective 4. Manage the Reserve effectively through the aegis of the Swanpool LNR Management Forum and the Swanpool Management Plan

Finance could potentially come from a variety of sources. Carrick District Council fund the overall maintenance of the reserve and have also funded various projects solely and jointly with other partner organisations. English Nature is likely to

provide grant aid as the site is a SSSI and LNR. The organisation may also provide funds towards the conservation of trembling sea-mat under its Species Recovery Programme. This might finance research into the current salinity regime and siltation rate as these are very relevant to this species. Other partners involved with the LNR may also provide funding opportunities, for example, the Cornwall Wildlife Trust and the Environment Agency. Much of the work is carried out by members of the management group 'in kind', with special projects and research requiring additional funds.

The management of the LNR should continue to be guided by a management plan that is reviewed every five years. A work programme for the reserve should be updated reviewed annually to ensure that objectives are met and planned for.

7. MANAGEMENT PROJECTS AND WORK PROGRAMME

This chapter identifies a list of management projects, which if implemented, will fulfil the management objectives identified in Chapter 6.

7.1 Management projects

Objective 1

Conserve the brackish lagoon and associated habitats

Habitat management

- 1.1 Maintain the shingle bar and outlet culvert
- 1.2 Maintain the culvert where the Tregoniggie Stream flows under road
- 1.3 Monitor the quality of the water in the lagoon and in the Tregoniggie Stream
- 1.4 Investigate sources and impacts of pollutants entering the lagoon and identify opportunities for reducing input
- 1.5 Distribute Environment Agency leaflet to residents in the Swanpool catchment area (*Appendix 10*)
- 1.6 Provide advice to industrial users about the release of waste into the Tregoniggie Stream
- 1.7 Monitor the siltation rate by measuring water depth at a series of fixed points on the lagoon
- 1.8 Ensure that the existing silt traps are regularly inspected and maintained
- 1.9 Carry out further research into the hydrology and salinity regimes of the lagoon
- 1.10 Monitor the extent of reedbed and woodland habitats by aerial photography
- 1.11 Monitor the extent of reedbed and woodland habitats by fixed point photography
- 1.12 Control scrub invasion to maintain the current extent of reedbed
- 1.13 Trim reeds annually along roadside margins of reedbed following consultation with English Nature on nesting birds
- 1.14 Plant grey willow in the gaps left by the coppiced alders
- 1.15 Continue to monitor the regeneration of coppiced alder stools
- 1.16 Eradicate Japanese knotweed according to latest Environment Agency guidelines.
- 1.17 Monitor the extent of Japanese knotweed annually in August
- 1.18 Remove other non-native plants from the Reserve

Objective 2

Maintain and enhance the population of the trembling sea-mat and other important species

Rare species management

- 2.1 Carry out further research into the ecology of the trembling sea-mat
- 2.2 Continue to monitor the population of the trembling sea-mat at Swanpool
- 2.3 Relate information collected in Project 1.9 to the population of the trembling sea-mat
- 2.4 Carry out a detailed botanical survey to relocate plants of national conservation value
- 2.5 Implement a programme to regularly survey populations of breeding and wintering birds
- 2.6 Monitor the breeding success of bird species which breed at the pool
- 2.7 Respond to any changes in the populations of rare or interesting species

Objective 3

Promote the educational and recreational use for the Reserve, ensuring compatibility with nature conservation

Amenity and education management

- 3.1 Maintain pavements and roads around reserve
- 3.2 Maintain existing paths within reserve
- 3.3 Maintain buoyancy aids and warning signs referring to blue-green algae
- 3.4 Provide signs to prohibit fishing and swimming
- 3.5 Include 'Local Nature Reserve' on directional signs to Swanpool
- 3.6 Continue to distribute leaflets about the reserve from the car park hut and beach café
- 3.7 Establish a Nature Reserve notice board to encourage the exchange of information and events relevant to the LNR
- 3.8 Provide an annual newsletter for local residents and visitors
- 3.9 Continue to maintain the Swanpool website (www.Swanpool.co.uk)
- 3.10 Arrange a meeting of the Swanpool Management Group at least annually
- 3.11 Provide training for voluntary wardens
- 3.12 Liaise with local schools to establish a group of junior wardens
- 3.13 Liaise with local colleges and universities to promote further ecological surveys and monitoring
- 3.14 Publicise Swanpool LNR locally through media
- 3.15 Patrol the reserve regularly
- 3.16 Continue to collect litter from around site
- 3.17 Monitor the impact of public use on habitats, flora and fauna and respond accordingly
- 3.18 Control rats if necessary

Objective 4

Manage the Reserve effectively through the aegis of the Swanpool LNR Management Forum and the Swanpool Management Plan

Administration

- 4.1 Management forum to meet twice a year
- 4.2 Management forum to involve local schools representative
- 4.3 Seek additional funding for the management of Swanpool
- 4.4 Review the management plan every five years
- 4.5 Review the management work programme annually

7.2 Work programme

The four groups of management projects: habitat management, rare species management, amenity and education management and administration, listed above, can be arranged into a five year work programme. This programme will run from 2001 to 2006 (*Table 5*). Each year, the annual work programme will be reviewed and revised accordingly (*Table 6*).

Table 5. Five year work programme

Project	Year					Season	Responsible body	Priority	
	1	2	3	4	5				
Habitat management									
1.1	Maintain the shingle bar and outlet culvert	*	*	*	*	*	All	CDC	1
1.2	Maintain the culvert where the Tregonigge Stream flows under road	*	*	*	*	*	All	CCC (transportation)	1
1.3	Monitor the quality of the water in the lagoon and in the Tregonigge Stream	*	*	*	*	*	All	EA	1
1.4	Investigate sources and impacts of pollutants entering the lagoon and identify opportunities for reducing input	*	*	*	*	*	All	EA	1
1.5	Distribute Environment Agency leaflet to residents in the Swanpool catchment area (<i>Appendix 10</i>)	*					Any	EA	2
1.6	Provide advice to industrial users about the release of waste into the Tregonnigie Stream	*					Any	EA	2
1.7	Monitor the siltation rate by measuring water depth at a series of fixed points on the lagoon	*	*	*	*	*	Any	EN/VW	1
1.8	Ensure that the existing silt traps are regularly inspected and maintained	*	*	*	*	*	Any	EA	2
1.9	Carry out further research into the hydrology and salinity regimes of the lagoon	*					Any	EA/EN	1
1.10	Monitor the extent of reedbed and woodland habitats by aerial photography					*	Any	VW	3
1.11	Monitor the extent of reedbed and woodland habitats by fixed point photography	*				*	Any	VW	2
1.12	Control scrub invasion to maintain the current extent of reedbed	*					Winter	EN?	2
1.13	Maintenance of the reedbeds should be carried out in consultation with English Nature	*	*	*	*	*	Winter	CDC	2
1.14	Plant local Provence willow in the gaps left by the coppiced alders	*					Winter	CDC	3

Project	Year					Season	Responsible body	Priority	
	1	2	3	4	5				
Habitat management cont.									
1.15	Continue to monitor the regeneration of coppiced alder stools	*	*	*	*	*	Spring	VW	3
1.16	Eradicate Japanese knotweed in consultation with and according to latest Environment Agency guidelines	*	*	*	*	*	Summer	CDC	1
1.17	Monitor the extent of Japanese knotweed annually in August	*	*	*	*	*	Late summer	VW	1
1.18	Remove other non-native plants from the Reserve	*	*	*	*	*	Winter	VW	3
Rare Species Management									
2.1	Carry out further research into the ecology of the trembling sea-mat	*	*	*	*	*	All	EN	1
2.2	Continue to monitor the population of the trembling sea-mat at Swanpool					*	All	EN	1
2.2	Relate information collected in Project 1.9 to the population of the trembling sea-mat	*	*	*	*	*	Any	EN	1
2.3	Carry out a detailed botanical survey to relocate plants of national conservation value	*					Early summer	VW	2
2.4	Implement a programme to regularly survey populations of breeding and wintering birds	*	*	*	*	*	All	VW	2
2.5	Monitor the breeding success of bird species at the pool	*	*	*	*	*	Spring	VW	2
2.7	Monitor and record the occurrence of rare or interesting species	*	*	*	*	*	Any	SMG	1
Amenity and Education Management									
3.1	Maintain pavements and roads around reserve	*	*	*	*	*	All	CDC	2
3.2	Maintain existing paths within reserve	*	*	*	*	*	All	CDC	2
3.3	Maintain buoyancy aids and warning signs referring to blue-green algae	*	*	*	*	*	All	CDC	2

Project	Year					Season	Responsible body	Priority
	1	2	3	4	5			
Amenity and Education Management cont.								
3.4 Provide signs to prohibit fishing and swimming	*					Any	CDC	2
3.5 Include 'Local Nature Reserve' on directional signs to Swanpool			*			Any	CDC	3
3.6 Continue to distribute leaflets about the reserve from the car park and beach café	*	*	*	*	*	All	CDC	2
3.7 Establish a Nature Reserve notice board to encourage the exchange of information and events relevant to the LNR		*				Any	CDC	3
3.8 Provide an annual newsletter for local residents and visitors		*	*	*	*	Winter	SMG	3
3.9 Continue to maintain the Swanpool website (www.Swanpool.co.uk)	*	*	*	*	*	All	CDC	2
3.10 Consider an annual publicity event to maintain the level of public interest and awareness of the LNR	*	*	*	*	*	Winter	SMG	1
3.11 Provide training for the voluntary wardens	*	*	*	*	*	All	SMG/VW	1
3.12 Liaise with local schools to establish a group of junior wardens	*	*	*	*	*	All	SMG	2
3.13 Liaise with local colleges and universities to promote further ecological surveys and monitoring	*	*	*	*	*	All	SMG	2
3.14 Publicise Swanpool LNR locally through media	*	*	*	*	*	All	SMG	2
3.15 Establish links with other LNRs in Cornwall	*	*	*	*	*	All	SMG	2
3.16 Patrol the reserve regularly	*	*	*	*	*	All	VW	2
3.17 Continue to collect litter from around site	*	*	*	*	*	All	CDC/VW	2
3.18 Monitor the impact of public use on habitats, flora and fauna and respond accordingly	*	*	*	*	*	All	CDC	3
3.19 Control rats if necessary	*	*	*	*	*	All	CDC	2

Project	Year					Season	Responsible body	Priority	
	1	2	3	4	5				
Administration									
4.1	Management forum to meet twice a year	*	*	*	*	*	All	SMG	1
4.2	Management forum to involve local schools representative	*				*	Any	SMG	1
4.3	Seek funding for management of Swanpool	*	*	*	*	*	All	SMG	1
4.4	Review the management plan every five years					*	Winter	SMG	1
4.5	Review the management work programme annually	*	*	*	*	*	Winter	SMG	1

Responsible body

CDC	Carrick District Council
CCC	Cornwall County Council – Transportation and Estates Department
EN	English Nature
EA	Environment Agency
CWT	Cornwall Wildlife Trust
VW	Voluntary Wardens
SMG	Swanpool Management Group
SGR	Swanpool and Gyllyngvase Residents' Association
All	All groups

Priority

1	High
2	Medium
3	Low

Table 6. Annual work programme

YEAR 1. January 2001 – December 2002

Project		Responsible body
1.1	Maintain the shingle bar and outlet culvert	CDC
1.2	Maintain the culvert where the Tregonigge Stream flows under road	CCC
1.3	Monitor the quality of the water in the lagoon and in the Tregonigge Stream	EA
1.4	Investigate sources and impacts of pollutants entering the lagoon and identify opportunities for reducing input	EA
1.5	Distribute Environment Agency leaflet to residents in the Swanpool catchment area (<i>Appendix 10</i>)	EA
1.6	Provide advice to industrial users about the release of waste into the Tregonigge Stream	EA
1.7	Monitor the siltation rate by measuring water depth at a series of fixed points on the lagoon	EN/EA/VW
1.8	Ensure that the existing silt traps are regularly inspected and maintained	EA
1.9	Carry out further research into the hydrology and salinity regimes of the lagoon	EN/EA
1.10	Monitor the extent of reedbed and woodland habitats by aerial photography	VW
1.11	Monitor the extent of reedbed and woodland habitats by fixed point photography	VW
1.12	Control scrub invasion to maintain the current extent of reedbed	CDC
1.13	Maintenance of reedbeds should be carried out in consultation with English Nature	CDC
1.14	Plant local provenance willow in gaps left by the coppiced alders	CDC
1.15	Continue to monitor the regeneration of coppiced alder stools	VW
1.16	Eradicate Japanese knotweed in consultation with and according to the latest Environment Agency guidelines	CDC
1.17	Monitor the extent of Japanese knotweed annually in August	VW
1.18	Remove other non-native plants from the Reserve	VW
2.1	Carry out further research into the ecology of the trembling sea-mat	EN
2.2	Continue to monitor the population of trembling sea-mat at Swanpool	EN
2.3	Relate information collected in Project 1.9 to the population of the trembling sea-mat	EN
2.4	Carry out a detailed botanical survey to relocate plants of national conservation value	VW
2.5	Implement a programme to regularly survey populations of breeding and wintering birds	VW
2.6	Monitor the breeding success of bird species which breed at the pool	VW
2.7	Monitor and record changes of the occurrence of rare or interesting bird species	SMG
3.1	Maintain pavements and roads around reserve	CCC
3.2	Maintain existing paths within reserve	CDC
3.3	Maintain buoyancy aids and warning signs referring to blue-green algae	CDC
3.4	Provide signs to advise against fishing and swimming	CDC
3.6	Continue to distribute leaflets about the reserve from the car park and beach café	CDC
3.9	Continue to maintain the Swanpool website (www.Swanpool.co.uk)	CDC

Project		Responsible body
3.10	Consider annual publicity event to maintain the level of public interest and awareness of the LNR	SMG
3.11	Provide training for the voluntary wardens	SMG/VW
3.12	Liaise with local schools to establish a group of junior wardens	SMG
3.13	Liaise with local colleges and universities to promote further ecological surveys and monitoring	SMG
3.14	Publicise Swanpool LNR locally through media	SMG
3.15	Establish links with other LNRs in Cornwall	SMG
3.16	Patrol the reserve regularly	VW
3.17	Continue to collect litter from around site	VW/CDC
3.18	Monitor the impact of public use on habitats, flora and fauna and respond accordingly	CDC
3.19	Control rats if necessary	CDC
4.1	Management forum to meet twice a year	SMG
4.2	Management forum to involve local schools representative	SMG
4.3	Seek additional funding for management of Swanpool	SMG
4.5	Review the management work programme annually	SMG

BIBLIOGRAPHY

Adams, S. (2000). *Swanvale Nature Reserve. Monitoring Plan 2000 – 2005*. A report to the Cornwall Wildlife Trust. Environmental Consultants (CTNC) Ltd, Truro.

Barnes R.S.K., Dorey A.E. and Little C. (1971). *An ecological study of a pool subject to varying salinity (Swanpool, Falmouth). An introductory account of the topography, fauna and flora*. *Journal of Animal Ecology* 40 : 709-734

Carrick District Council (1998). *Carrick District-Wide Local Plan*. Carrick District Council, Truro.

Cordrey, L ed. (1996). *The Biodiversity of the South West*. An audit of the South West biological resource. RSPB, County Wildlife Trusts and the South West Regional Planning Conference.

CBI [Cornwall Biodiversity Initiative] (1997) *Cornwall's Biodiversity Volume 1: Audit and Priorities*. Cornwall Wildlife Trust, Truro.

CBI [Cornwall Biodiversity Initiative] (1998) *Cornwall's Biodiversity Volume 2: Action Plans*. Cornwall Wildlife Trust, Truro.

Cornwall County Council (1997). *Replacement Structure Plan*. Cornwall County Council, Truro

Crawford R.M., Dorey A.E., Little C., Barnes R.S.K. (1979). *Ecology of Swanpool, Falmouth V. Phytoplankton and nutrients*. *Estuarine and Coastal Marine Science* 9 : 135-160

CEC [Council of the European Communities] (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora [referred to as EC Habitats Directive]. *Official journal of the European Communities: L206*

Davidson *et al* (1991). *Nature conservation and estuaries in Great Britain*. Chief Scientist Division. Nature conservancy Council, Peterborough

Dorey A.E., Little C. and Barnes R.S.K. (1973). *An ecological study of the swanpool, Falmouth II. Hydrology and its relation to animal distributions*. *Estuarine and Coastal Marine Science* 1 : 153-176

EA [Environment Agency] (1997). *Fal and St Austell Streams Consultation Report*. March 1997. Local Environment Agency Plan. EA, Bodmin.

EN [English Nature] (1991). *Local Nature Reserves in England*. English Nature, Peterborough

EN [English Nature] (1995). *Swanpool Site of Special Scientific Interest*. Citation sheet. EN, Truro.

Fal Bay and Estuaries Initiative (1996). *Strategic guidelines consultation draft*. October 1996. FBEL, Cornwall County Council, Truro.

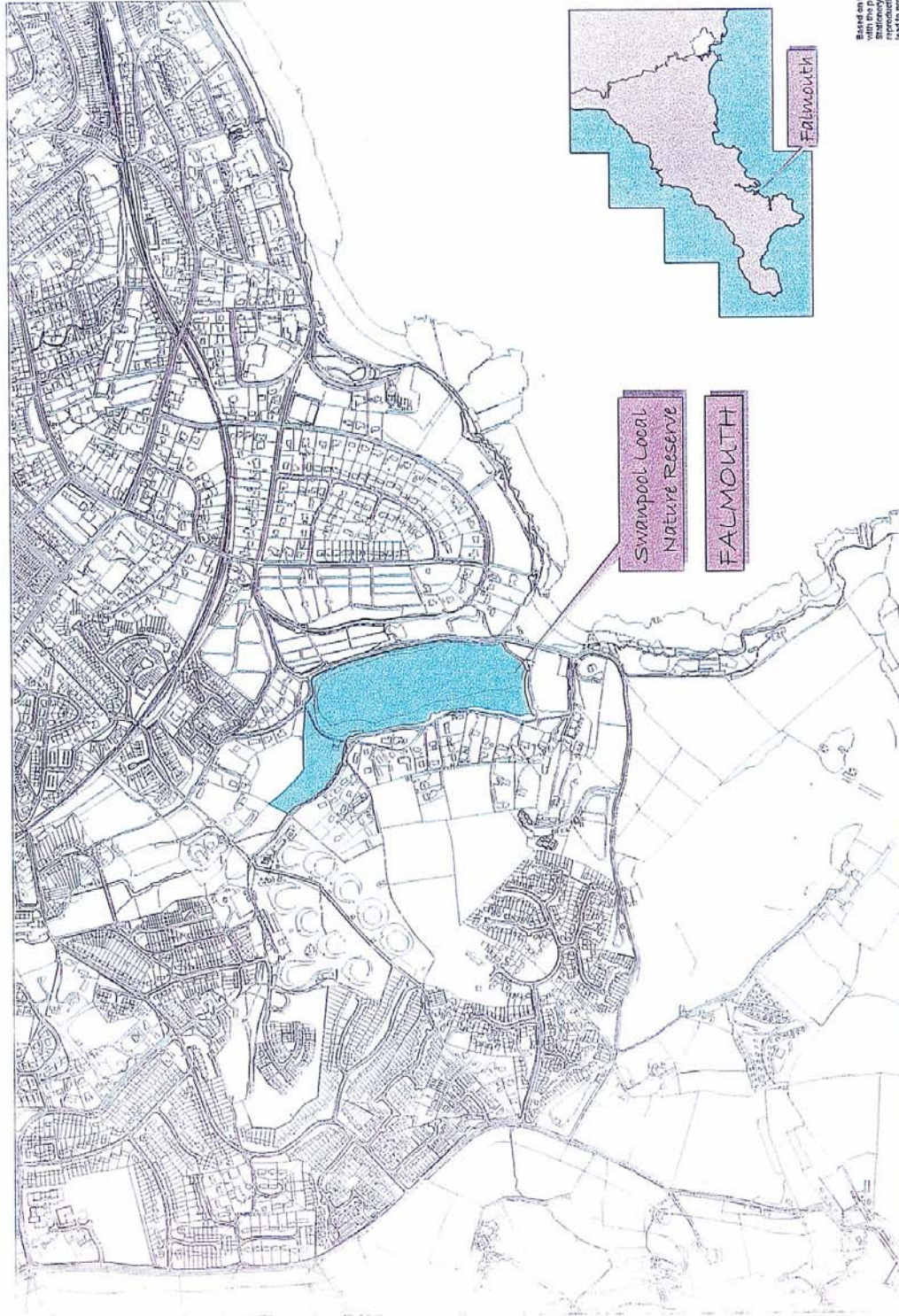
Gainey, P. (1997). *Trembling Sea-mat. Baseline distribution and species action plan*. English Nature Research Report. No 225. EN, Peterborough.

- Gowenlock, J. (1994). *Swanpool management plan*. A report to Carrick District Council and Swanpool Residents' Association. Environmental Consultants (CTNC) Ltd, Truro.
- Halcrow (1999). *Rame Head to Lizard Point Shoreline Management Plan*. Halcrow, London
- HM Government (1981) *The Wildlife and Countryside Act 1981*. HMSO, London
- HM Government (1991) *The Wildlife and Countryside (Amendment) Act*. HMSO, London
- HM Government (1992) *Statutory Instrument 1992 No. 2350* [variations to Schedules 5 and 8 of the Wildlife and Countryside Act]. HMSO, London
- HM Government (1998) *Statutory Instrument 1998 No. 878* [variations to Schedules 5 and 8 of the Wildlife and Countryside Act]. HMSO, London
- JNCC [Joint Nature Conservation Committee] (1991). *British Red Data Book 3 – Invertebrates other than insects*. JNCC Peterborough
- JNCC [Joint Nature Conservation Committee] (1992). *Guidelines for the Selection of Biological SSSIs – Non-vascular plants*. JNCC, Peterborough
- Little C. (1985). *Coastal saline lagoons in Cornwall*. (C.S.D. Report No 601). Nature Conservancy Council, Peterborough
- Little C., Barnes R.S.K., Dorey A.E. (1973). *An ecological study of the Swanpool, Falmouth 3. Origin and History*. Cornish Studies
- NCC [Nature Conservancy Council] (1989). *Guidelines for the Selection of Biological SSSIs*. NCC, Peterborough
- Perring, F.H. and Farrell, L. (1983). *British Red Data Books: Vol 1. Vascular Plants*. Second Edition. RSNC, Lincoln.
- The Wildlife Trusts (1997). *The Wildlife Trust Handbook*. RSNC, Lincoln
- Whitton, A.J. (1990). *Recovery. A proposed programme for Britain's protected species*. NCC, Peterborough
- Spalding, A. (Ed.) (1997) *Red Data Book for Cornwall and the Isles of Scilly*. Croceago Press, Camborne.
- Stewart, A., Pearman, D.A. & Preston, C.D. (Eds.) (1994) *Scarce Plants in Britain*. JNCC, Peterborough
- UK Biodiversity Steering Group (1995) *Biodiversity: The UK Steering Group Report* (2 vols.) HMSO, London.
- UK Biodiversity Steering Group (1998-9) *Biodiversity: The UK Group Tranche 2 Action Plans* (4 vols.) EN, Peterborough.

MAPS

1. Location of Swanpool Local Nature Reserve
2. Tenure and Public Access
3. Land Use Policies
4. Hydrology
5. Habitats and Uses

Location of Swanpool Local Nature Reserve
Falmouth



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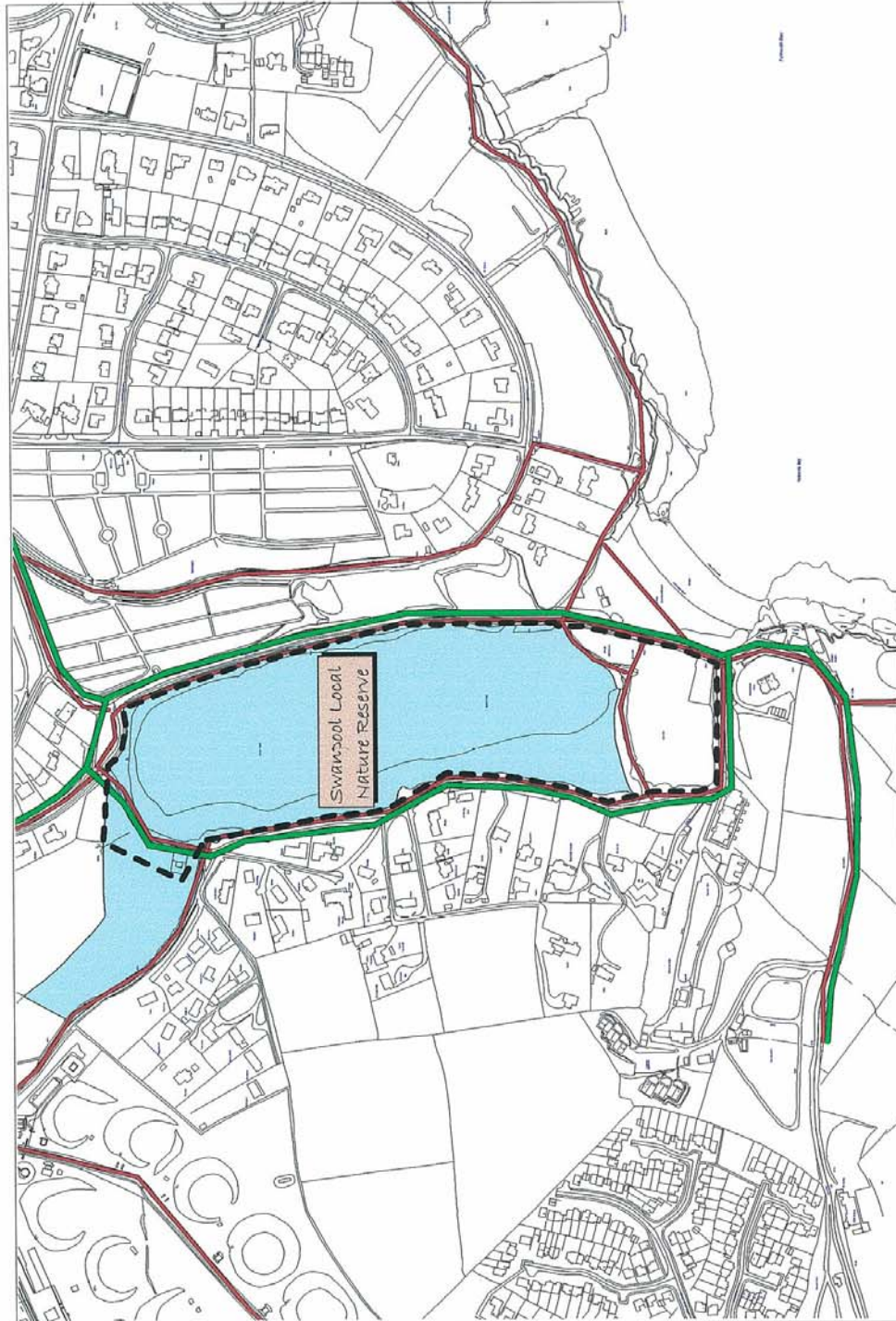
Swanpool Local Nature Reserve Falmouth

TENURE AND PUBLIC ACCESS

Carrick District Council
ownership boundary

Public highway

Public paths



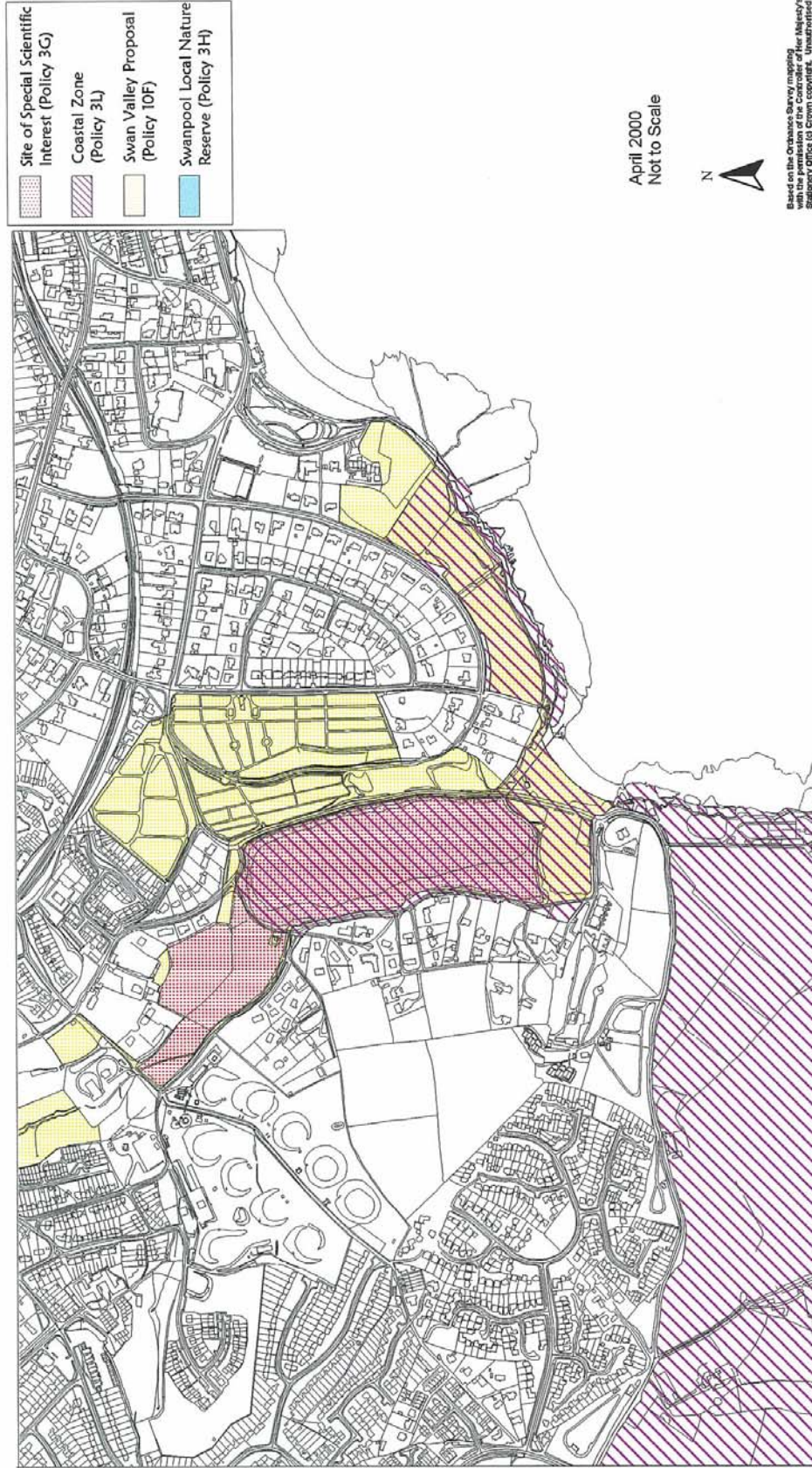
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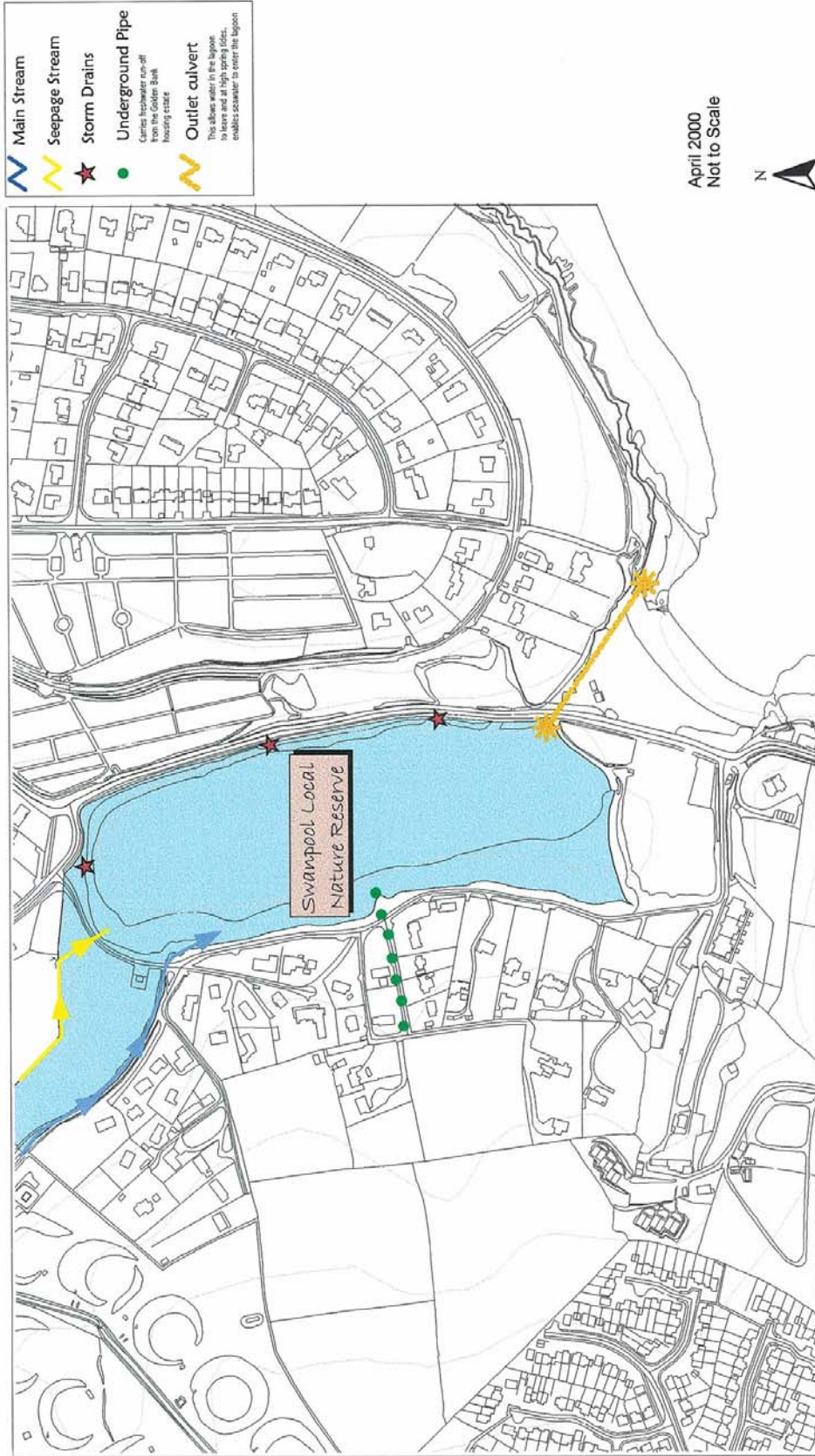
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Swanpool Local Nature Reserve Falmouth

HYDROLOGY



-  Main Stream
-  Seepage Stream
-  Storm Drains
-  Underground Pipe
Carries freshwater run-off from the Golden Bank housing estate
-  Outlet culvert
This allows water in the lagoon to leave and at high spring tides, enables seawater to enter the lagoon

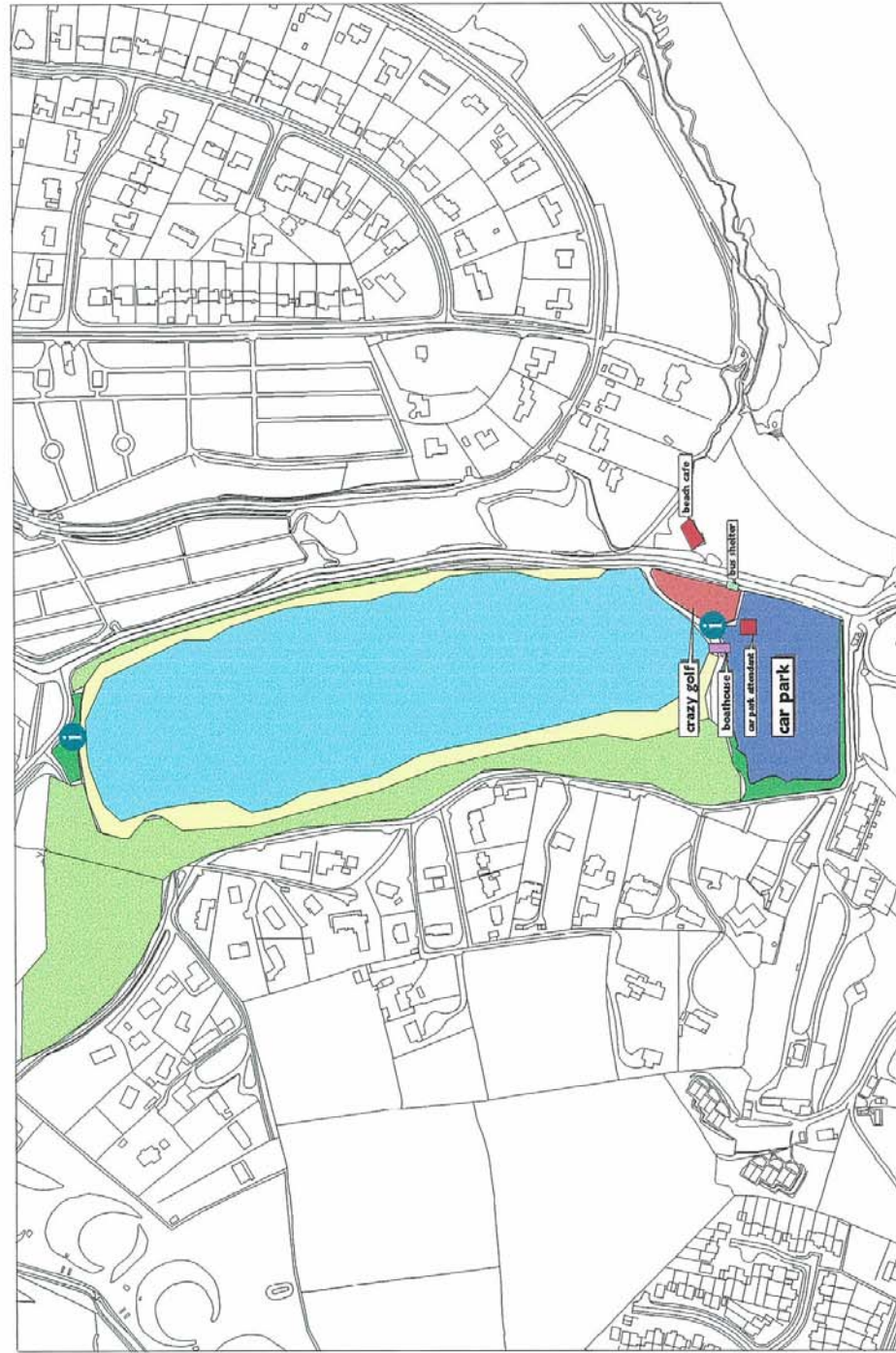
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Swanpool Local Nature Reserve Falmouth

HABITATS AND USES



Interpretation Boards

- Phragmites marsh
- Salix carr
- Crassed areas

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