

**CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES**

**CORE MANAGEMENT PLAN
INCLUDING CONSERVATION OBJECTIVES**

FOR

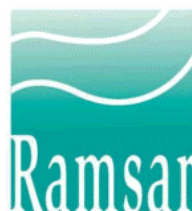
**PEMBROKESHIRE BAT SITES AND BOSHERSTON LAKES
SAC (SPECIAL AREA OF CONSERVATION)**

Version: 10

Date: 10 April 2008

Approved by: Tracey Lovering

A Welsh version of all or part of this document can be made available on request.



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PREFACE

This document provides the main elements of CCW's management plan for the sites named. It sets out what needs to be achieved on the sites, the results of monitoring and advice on the action required. This document is made available through CCW's web site and may be revised in response to changing circumstances or new information. This is a technical document that supplements summary information on the web site.

One of the key functions of this document is to provide CCW's statement of the Conservation Objectives for the relevant Natura 2000 sites. This is required to implement the Conservation (Natural Habitats, &c.) Regulations 1994, as amended (Section 4). As a matter of Welsh Assembly Government Policy, the provisions of those regulations are also to be applied to Ramsar sites in Wales.

1. VISION FOR THE SITE

This is a descriptive overview of what needs to be achieved for conservation on the site. It brings together and summarises the Conservation Objectives (part 4) into a single, integrated statement about the site.

Our vision for the Pembrokeshire Bat Sites and Bosherton Lakes SAC is that standing open freshwater habitats and communities, supporting Charophytes (stoneworts) will be maintained in Bosherton Lakes. In summer the crystal clear western and central arms of the lake will reveal quite striking beds of submerged bristly stonewort *Chara hispida* vegetation. The broad, glossy-green leaves of white water lilies will fringe the stonewort beds. Large white flowers are produced at the water surface, during the summer months.

The lake system will be generally well vegetated with submerged and marginal plants. In the Eastern Arm and Central Lake, curled pondweed and water milfoil will both be quite common. Other submerged plants, include the grass-like fennel-leaved pondweed and small pondweed. Smaller quantities of *Chara* species will be found along surveillance transects, a sign that water quality is good.

Water depth will vary from about 3.5 metres (winter maximum) to about 0.5 metres or less in places in summer. The western and central arms are spring-fed, so nutrient levels here are low. One of the main nutrients (phosphorus) (P) will reach no more than 25 micrograms per litre in regular sampling points. In the stream-fed eastern arm, P will be no more than 50 micrograms per litre. Nitrogen (N) levels should be less than 1 mg/ltr at all sampling points.

Tall swamp plants (such as reed and bur-reed) occur along shallower, lake margins, and at the heads of the main arms. Deciduous ash and sycamore-dominated woodland, with willow and blackthorn shrubs, clothe the valley sides, reaching down to the margins of the main water bodies in many places.

Otters will be seen regularly in the lakes – diving for their favourite prey (eels) and other freshwater fish. Otters will be thriving, breeding in one of several secluded lakeside crevices (holts) where the shoreline is swampy or the thickly wooded. Fresh or recent droppings (spraint) will be regularly being deposited as territory markers on prominent features, such as rocks or fallen tree trunks, along the shoreline. Adult otters and occasionally female plus cubs are occasionally seen from paths or causeways.

In woody lakeside margins at night, bat detectors will reveal the presence of feeding bats, including greater and lesser horseshoe bats in sheltered flyways. Both horseshoe bat species breed at component SSSI, where there are also important intermediate and hibernation roosts. Regular counts will reveal that their populations remain healthy and are stable or increasing.

Greater horseshoe bats will breed at Stackpole Courtyard Flats and Walled Garden SSSI, Slebech Stable Yard Loft, Cellars and Tunnels SSSI and Felin Llwyn-gwair SSSI. The bats will continue to utilise an important intermediate roost at Carew Castle SSSI.

Lesser horseshoe bats will breed at Stackpole Courtyard Flats and Walled Garden SSSI, Park House Outbuildings SSSI Orielton Stable Block and Cellars SSSI and Beech Cottage Waterwynch SSSI.

All individual roost sites within component SSSI, used by breeding or hibernating bats, will be maintained in good condition and be free of disturbance. Sheltered flyways and a network of insect-rich foraging habitat will also be maintained within SSSI and the surrounding areas.

2. SITE DESCRIPTION

2.1 Area and Designations Covered by this Plan

Grid reference: SR976954

Local authorities:

- Pembrokeshire County Council (unitary authority). PCC is the local planning authority outside the National Park boundaries.
- Pembrokeshire Coast National Park Authority (Special Purpose Authority, Environment Act 1995); PCNPA is the planning authority for the area within the National Park boundaries.

Area (hectares): 122.59 ha

Designations covered:

Stackpole SSSI
Stackpole Courtyard Flats and Walled Garden SSSI
Slebech Stable Yard Loft, Cellars and Tunnels SSSI
Felin Llwyn-gwair SSSI
Carew Castle SSSI
Beech Cottage Waterwynch SSSI
Orielson Stable Block and Cellars SSSI
Park House Outbuildings SSSI

Detailed maps of the designated sites are available through CCW's web site::

<http://www.ccw.gov.uk/interactive-maps/protected-areas-map.aspx>

2.2 Outline Description

Pembrokeshire Bat Sites and Bosherton Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton is underpinned by a series of eight Sites of Special Scientific Interest (SSSI). These SSSI include a range of additional SSSI features that, whilst not qualifying in their own right under the Habitats Directive, form an important and integral part of the whole SAC. These additional features should be considered before carrying out any action that may affect the site.

Bosherton Lakes (also known as Bosherton Lily Pools), within Stackpole SSSI, are an outstanding shallow marl lake system created at intervals in the late 18th and mid 19th Century by damming and drowning three valleys in the Carboniferous Limestone. The National Trust owns the lakes within the Stackpole National Nature Reserve, managed in partnership with CCW.

Three small streams, flowing in deeply incised valleys, feed the lake system. These are sandwiched between a Carboniferous Limestone plateau and an Old Red Sandstone ridge. Parts of the water body are fed by calcium-rich ground-water sources. The lakes are isolated from the sea by a small sand dune ridge at Broadhaven. The lakes support a strong population of rooted submerged and floating aquatic plants, their distribution largely reflecting the differing degrees of eutrophication within the lake system.

This shallow highly calcareous water body is renowned for its Charophyte (stonewort) beds and associated marl formations. The spring-fed Western and Central Arms sections contain

mainly clear water communities dominated by *Chara hispida* - including probably the largest population of *Chara hispida* in Wales, a species that is rare in the Principality. There are also extensive beds of white water-lily *Nymphaea alba*.

In contrast the Eastern arm, which is not noted for *Chara*, is characterised by variable dense stands of curled pondweed *Potamogeton crispus*, fennel pondweed *P. pectinatus* and spiked water-milfoil *Myriophyllum spicatum*.

A separate valley south of the lakes, known as the Mere Pool valley, runs westward from Broadhaven. It contains semi-natural and man-made ground-water-fed pools and swamp, plus a wealth of other habitats in a small area - including dunes, coastal cliff, woodland and calcareous scrub plus associated communities and species.

Much of the lake shoreline is wooded. By the inflow streams and lake-shoreline alongside Stackpole Warren there is emergent vegetation of common reed, bulrush, common spike-rush, branched bur-reed and greater pond-sedge and developing swamp and fen communities.

Otters are resident within and around the lake margins and have at least one breeding holt. The lake system is a stronghold for this species. The otters' favourite prey includes the abundant eels. They also feed on coarse fish (roach, perch and pike), which can be abundant in the lake.

Greater and lesser horseshoe bats are among at least ten species of bat utilising the surrounding woodland and swampy lakeside margins as feeding flyways connected to important summer, winter and intermediate roost sites, which are component SSSI within the overarching SAC.

The populations of greater and lesser horseshoe bats in Britain have suffered serious declines recently and are restricted mainly to Wales and the South West of England. Both greater horseshoe bats and lesser horseshoe bats feed, and have important sheltered flight corridors, at Stackpole - through woodland at Coldwell, Lodge Park, Castle Dock, Cheriton, Stackpole Warren and the Mere Pool valley – all linked to lakeside habitats.

The other SSSI which make up the SAC represent a range of important nursery and hibernation roosts for horseshoe bats across Pembrokeshire, ranging from adjacent nursery roosts in the Stackpole Courtyard Flats and Walled Garden SSSI, in South Pembrokeshire to Slebech Stableyard lofts and tunnels SSSI in mid Pembrokeshire to Felin Llwyngwair SSSI in North Pembrokeshire.

Orielton Stable Block and cellars SSSI, Beech Cottage, Waterwynch SSSI and Park House Outbuildings SSSI, hold significant nursery roosts of lesser horseshoe bats in Pembrokeshire.

Carew Castle SSSI provides a range of important intermediate roosting sites for greater and lesser horseshoe bats, particularly between spring and autumn, including a summer roost for male bats and a mating roost. Surrounding castle grassland and walled boundaries provide important feeding areas connected to bat flyways and a range of temporary roosting sites through a well-wooded pastoral landscape, including along the tidal Cleddau (part of the Pembrokeshire Marine SAC).

For further details refer to JNCC Report Number 270 (available from the JNCC website) and reasons for recommendation for the Bat Sites and Bosherton Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton.

2.3 Outline of Past and Current Management

There are many different aspects to the management of this large and complex site. These are summarised in the Site Management Statements for the component SSSIs

2.4 Management Units

The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on the following:

- SSSI boundaries
- Tenure
- NNR management units (compartments) (for part of the site)
- Individual bat roosts where, for example, there are significant differences and feature requirements between winter and summer
- The Stackpole NNR/SSSI unit and sub-units and lake catchment are all within the Environment Agency Catchment Abstraction Management Strategy (CAMS) unit GWMU1 (See Appendix 1)

Detailed maps of the designated sites are available through CCW's web site:

<http://www.ccw.gov.uk/interactive-maps/protected-areas-map.aspx>

The following table confirms the relationships between the management units and the designations covered:

Unit no.	Unit name	SAC	SSSI	NNR/CCW	Other
1. Stackpole SSSI					
1a	Bosherston Lake Open water - Central and Western arms (NNR/CMS compartments/zones 20, 21, 22, 23)	✓	✓	✓ 1	NT
1b	Bosherston Lake Open water - Eastern Arm (NNR/CMS zones 25, 26)	✓	✓	✓ 1	NT
1c	Lakeside swamp & woodlands (NNR/CMS zones 80-88, 24, 30-32)	✓	✓	✓ 1	NT
1d	Mere Pool Valley swamp and woodland (NNR/CMS zones 33 and 69)	✓	✓	✓ 1	NT
2. Stackpole Courtyard Flats and Walled Garden SSSI					
2a	Courtyard Flats lofts (GHB and LHB maternity roosts) (SSSI/CMS zone 76)	✓	✓	✓ 2	NT
2b	Walled Garden cellars & tunnels (winter/intermediate roost) (SSSI/CMS zone 77)	✓	✓	✓ 2	NT
3. Slebech Stable Yard Loft, Cellars and Tunnels SSSI					
3a	Slebech lofts (GHB maternity roost)	✓	✓	✓ 2	
3b	Slebech cellars & tunnels (winter/intermediate roosts)	✓	✓	✓ 2	
4. Felin Llwyn-gwair SSSI					
4	Mill building (GHB maternity & winter roost)	✓	✓		
5. Carew Castle SSSI					
5	Carew Castle SSSI	✓	✓		PCNPA
6. Beech Cottage Waterwynch SSSI					
6	Beech Cottage Waterwynch SSSI	✓	✓		
7. Orierton Stable Block and Cellars SSSI					
7	Orierton Stable Block and Cellars SSSI	✓	✓		
8. Park House Outbuildings SSSI					
8	Park House Outbuildings SSSI	✓	✓		

NT = National Trust

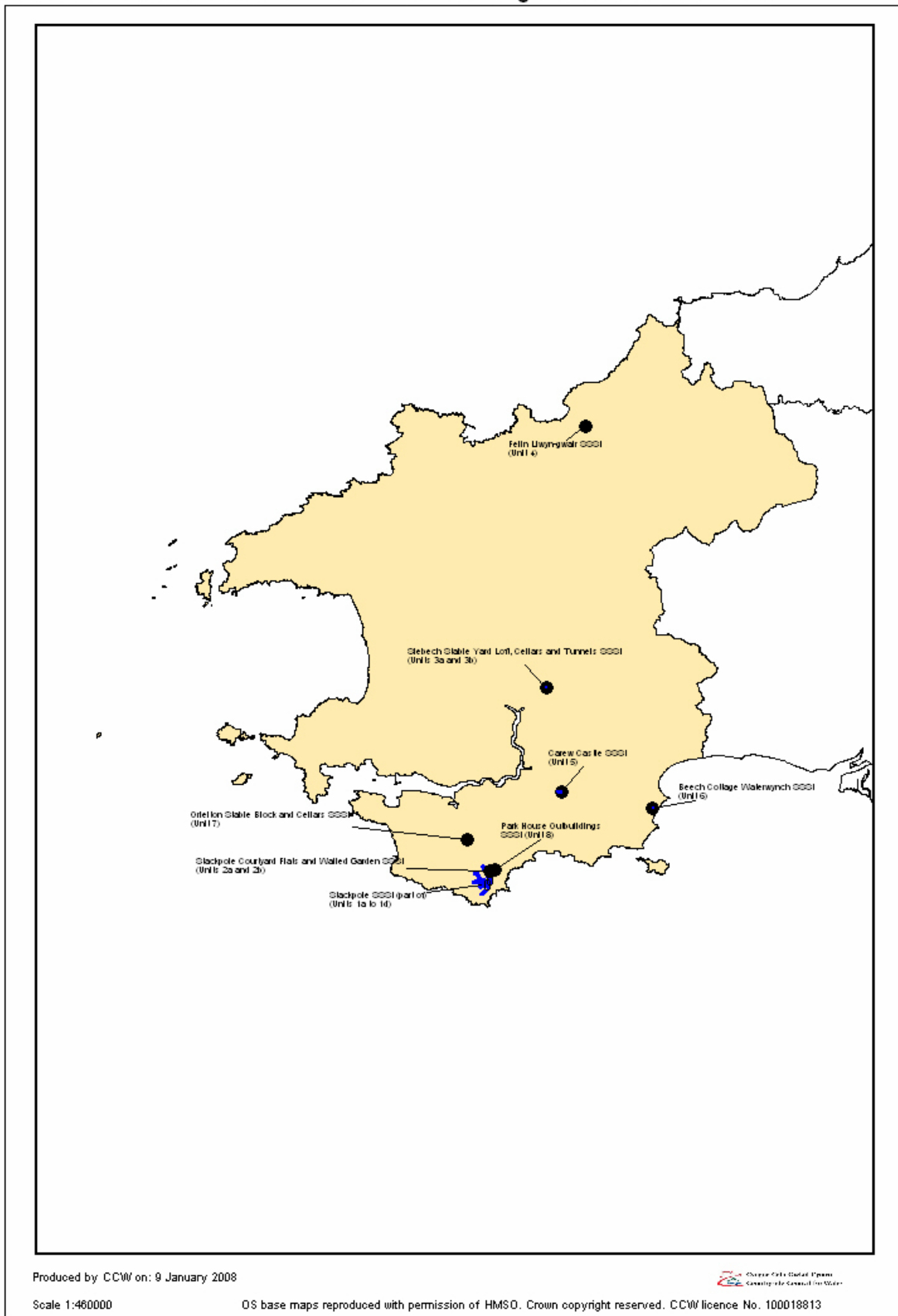
PCNPA = Pembrokeshire Coast National Park Authority

✓ 1 = CCW Nature Reserve Agreement

✓ 2 = CCW Section 15 Management Agreement

A map of the general locations of component SSSI and management units is shown below. A map showing the Bosherston Lakes CAMS unit and catchment area is shown in Annex 1.

Pembrokeshire Bat Sites and Bosherton Lakes SAC - general SSSI unit locations



3. THE SPECIAL FEATURES

3.1 Confirmation of Special Features

<i>Designated feature</i>	<i>Relationships, nomenclature etc</i>	<i>Conservation Objective no. in part 4</i>
<i>SAC features</i>		
<i>Annex I habitats that are a primary reason for selection of this site</i> 1. Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp./Calcium-rich nutrient-poor lakes, lochs and pools (EU Habitat Code: 3140)	Generally referred to as ‘marl lakes throughout this document	1
<i>Annex II species that are a primary reason for selection of this site</i> 2. 1304 Greater horseshoe bat <i>Rhinolophus ferrumequinum</i> (EU Species Code: 1304)	Generally referred to as ‘greater horseshoe bat’ throughout this document	2
<i>Annex II species present as a qualifying feature, but not a primary reason for site selection</i> 3. Lesser Horseshoe Bat <i>Rhinolophus hipposideros</i> (EU Species Code: 1303)	Generally referred to as ‘lesser horseshoe bat’ throughout this document	3
<i>Annex II species present as a qualifying feature, but not a primary reason for site selection</i> 4. Otter <i>Lutra lutra</i> (EU Species Code: 1355)	Generally referred to as ‘otter’ throughout this document	4
<i>SSSI features</i>		
<p>The following additional SSSI features relate only to Stackpole SSSI/NNR management units.</p> <ul style="list-style-type: none"> • <i>Standing freshwater habitats & communities</i> • <i>Fen/Swamp</i> • <i>Neutral/calcareous woodland & scrub</i> • <i>Epiphytic Lichen Assemblage</i> (part of the extent of this feature is within Pembrokeshire Bat Sites and Bosherton Lakes SAC, the remainder is within Limestone Coast of South Wales SAC) • <i>Brachytron pratense</i> - hairy dragonfly • <i>Bird Assemblage</i> (part of the extent of this feature is within Pembrokeshire Bat Sites and Bosherton Lakes SAC, the remainder is within Limestone Coast of South Wales SAC) <p>These SSSI features have not been included in this management plan because:</p> <ul style="list-style-type: none"> • It is likely that management for SAC features will be sympathetic to them. • Conservation objectives and appropriate management are taken into account within Stackpole NNR/SSSI Management Plan (in CMS). 		

3.2 Special Features and Management Units

This section sets out the relationship between the special features and each management unit. This is intended to provide a clear statement about what each unit should be managed for, taking into account the varied needs of the different special features.

All special features are allocated to one of seven classes in each management unit. These classes are:

Key Features

KH - a 'Key Habitat' in the management unit, i.e. the habitat that is the main focus of management and monitoring effort, perhaps because of the dependence of a key species (see KS below). There will rarely be more than one Key Habitat in a unit.

KS – a 'Key Species' in the management unit, often driving both the selection and management of a Key Habitat.

Geo – an earth science feature that is the main focus of management and monitoring effort in a unit.

Other Features

Sym - habitats, species and earth science features that are of importance in a unit but are not the main focus of management or monitoring. These features will benefit from management for the key feature(s) identified in the unit. These may be classed as 'Sym' features because:

- a) they are present in the unit but are of less conservation importance than the key feature; and/or
- b) they are present in the unit but in small areas/numbers, with the bulk of the feature in other units of the site; and/or
- c) their requirements are broader than and compatible with the management needs of the key feature(s).

Nm - an infrequently used category where features are at risk of decline within a unit as a result of meeting the management needs of the key feature(s), i.e. under Negative Management. These cases will usually be compensated for by management elsewhere in the plan, and can be used where minor occurrences of a feature would otherwise lead to apparent conflict with another key feature in a unit.

Mn - Management units with no special feature present but which are of importance for management of features elsewhere on a site e.g. livestock over-wintering area included within designation boundaries.

x – Features not present in the management unit.

The tables below set out the relationship between the special features and management units identified in this plan:

1. Stackpole SSSI	Management Units			
	1A	1B	1C	1D
SAC	✓	✓	✓	✓
SSSI	✓	✓	✓	✓
NNR (CCW/NT management agreement)	✓	✓	✓	✓
SAC features				
1. Limestone lakes with <i>Chara</i>	KH	Sym	x	Sym
2. Greater horseshoe bat	x	x	Sym	Sym
3. Lesser horseshoe bat	x	x	Sym	Sym
4. Otter	KS	KS	KS	KS
SSSI features				
5. Standing freshwater habitats & communities	Sym	Sym	x	Sym
6. Fen/Swamp	Sym	Sym	KH	KH
7. Neutral/calcareous woodland & scrub	x	x	Sym	Sym
8. Part of Epiphytic Lichen Assemblage	x	x	Sym	Sym
9. Brachytron pratense - hairy dragonfly	Sym	Sym	x	Sym
10. Part of Bird Assemblage	Sym	Sym	Sym	Sym

2. Stackpole Courtyard Flats and Walled Garden SSSI	Management Units	
	2A	2B
SAC	✓	✓
SSSI	✓	✓
Sect 15 management agreement	✓	✓
SAC features		
2. Greater horseshoe bat	KS	Sym
3. Lesser horseshoe bat	Sym	KS

3. Slebech Stable Yard Loft, Cellars and Tunnels SSSI	Management Units	
	3A	3B
SAC	✓	✓
SSSI	✓	✓
Sect 15 management agreement	✓	✓
SAC features		
2. Greater horseshoe bat	KS	KS
3. Lesser horseshoe bat	x	Sym

4. Felin Llwyn-gwair SSSI	Management Units
	4
SAC	✓
SSSI	✓
SAC features	
2. Greater horseshoe bat	KS
3. Lesser horseshoe bat	Sym

5. Carew Castle SSSI	Management Units
	5
SAC	✓
SSSI	✓
SAC features	
2. Greater horseshoe bat	KS
3. Lesser horseshoe bat	Sym

6. Beech Cottage Waterwynch SSSI	Management Units
	6
SAC	✓
SSSI	✓
SAC features	
2. Greater horseshoe bat	x
3. Lesser horseshoe bat	KS

7. Orierton Stable Block and Cellars SSSI	Management Units
	7
SAC	✓
SSSI	✓
SAC features	
2. Greater horseshoe bat	Sym
3. Lesser horseshoe bat	KS

8. Park House Outbuildings SSSI	Management Units
	8
SAC	✓
SSSI	✓
SAC features	
2. Greater horseshoe bat	Sym
3. Lesser horseshoe bat	KS

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive

“The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.”

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the ‘Habitats’ Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses ‘performance indicators’ within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW’s current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors that have an important influence on the condition of the feature are identified in the performance indicators.

¹ Web link: <http://www.jncc.gov.uk/page-2199>

**4.1 Conservation Objective for Feature 1: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp./Calcium-rich nutrient- poor lakes, lochs and pools.
(EU Habitat Code: 3140)**

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- Submerged *Chara* beds (mainly *Chara hispida* in places up to a metre long) will form the predominant submerged macrophyte vegetation throughout most of Central and Western Arms and Central Lake of Bosherton Lakes (unit 1a) and may be present in the Eastern Arm (unit 1b).
- *Chara* will occur at more than 50% frequency along regular surveillance transects within the Western and Central arms.
- *Chara* species (not necessarily *hispida*) will be present in other embayments and pools, including the Eastern Arm of Bosherton Lakes (unit 1b) and pools in the Mere Pool Valley (unit 1d).
- The Western and Central Arms are spring-fed, so nutrient levels here remain low. One of the main nutrients (phosphorous) will reach no more than 25 micrograms per litre in regular sampling areas. Nitrogen levels in the water will be low (less than 1 milligram per litre) and declining or stable.
- The Western Arm, Central Arm and Central Lake water will be fairly clear, but well vegetated with submerged and marginal plants. In natural openings (e.g. over springs) within otherwise dense *Chara* beds, a sechii disk will be viewable on the lakebed.
- Water depth will vary from about 3.5 metres OD (winter maximum) to about 0.5 metres or less in places in summer.
- Fringing the *Chara* beds, are beds of white water lilies *Nymphaea alba*. They will remain fairly abundant in the Western and Central Arms, with smaller populations in Central Lake.
- Reed and swamp and fringing burr-reed will be restricted to shallow zones – covering not more than 10 % of the site.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition		
Attribute	Attribute rationale and other comments	Specified limits
A1. Extent of standing water	<p>Lake hydrology measurements have been recorded for approx 30 years - measured at gauge boards. This provides the baseline for future comparisons.</p> <p>There should be no loss of extent of standing water within the Bosherton Lake system (management units 1a and 1b). This is measured by standard gauging boards or by water level sensors linked to data-loggers.</p>	<p>Units 1a and 1b Central & Western Arms (1a) & Eastern Arm (1b)</p> <p>Open water surface extent (in winter) should be approximately 30 ha:</p> <p><u>Upper limit:</u> None set – limited by valley topography</p> <p><u>Lower limit:</u> Central Arm 4.0 ha; Central Lake 4.5 ha; Western Arm 6.0 ha; Eastern Arm 15.5 ha</p>
A2. Extent of <i>Chara hispida</i> beds	<p>The extent of <i>Chara</i> beds has previously been recorded on GIS and this provides a useful baseline for future comparisons. Monitoring will require boat- and land-based methods, utilising GPS to record sample locations, GIS base-maps plus ground and aerial photographs in GIS. GPS stored waypoints recorded over the lake surface from a boat, plus maps and photographs will be used to plot extent on GIS for comparison with previous extent data held in MapInfo TAB file layers.</p>	<p>Unit 1a Central and Western arms</p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Charophyte communities, dominated by <i>Chara hispida</i>, should be growing over > 30% of the lake bottom within the Western and Central Arms.</p>
A3. Vegetation composition: macrophyte community composition (Species, indicative of condition)	<p>A series of surveillance transects have been established to record submerged macrophyte vegetation species. Data from these areas and GPS recordings stored in Recorder and Map-Info GIS provides a useful baseline for future comparisons.</p> <p>Monitoring will require boat-based methods, utilising GPS to record sample locations, a grapnel to record the plant material, GIS and recorder to plot/store the plant records. GPS stored waypoints recorded over the lake surface from a boat, plus maps and photographs will be used to help plot <i>Chara</i> presence/absence and condition.</p>	<p>Clear water plant communities should be present along seven standard transects sampled in the Western and Central Arms and Central Lake, of which:</p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> <i>Chara hispida</i> should have a frequency of at least: 50% in 3 out of 4 transects in the Western Arm (T12, 17, 18 & 19); 70% in the Central Arm transect (T10); 20% in the Central Lake (T4 & T13).</p>

Performance indicators for feature condition (cont.d)		
Attribute	Attribute rationale and other comments	Specified limits
A4. Macrophyte Community structure	As A3.	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Dense beds of healthy <i>Chara hispida</i> (\leq 1m high) should be present within the Central and Western Arms and Central Lake.</p> <p>The Chara beds should be fringed in places by beds of white water lilies <i>Nymphaea alba</i> plus or minus reed swamp: \leq 10 metres wide in the Central Arm (transect 10) \leq 5 metres wide in the Western Arm (transects 12, 17, 18 and 19) and Central Lake (transect 13).</p>
A5. Vegetation composition: (negative indicator species)	As A3.	<p><u>Lower limit:</u> None set</p> <p><u>Upper limit:</u> <i>Myriophyllum spicatum</i>, <i>Potamogeton pectinatus</i>, <i>Elodea canadensis</i>, <i>Lemna</i> spp. should have a frequency of: $<$30% along transects 4, 10, 12, 13, 17, 18 and 19; and filamentous algae $<$ 20% along transects 4, 10, 12, 13, 17, 18 and 19; and Non-native species (e.g. <i>Azolla filiculoides</i>) should be absent from all transects.</p>
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Water quality	Significant work has been achieved with partners (such as the Environment Agency) to reduce the effects of point sources of nutrients on Bosherton Lakes. Key nutrients have been monitored regularly at standardised sampling points for approx 30 years. Quite low levels of phosphorus (P) are essential to maintain regular clear water conditions and ensure healthy stonewort growth. High phosphate concentrations cause ecological changes. Phosphate and nitrate may interact.	See below

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Water quality (cont.d)	<p>Regular water quality sampling at established locations will be used to compare nutrient levels. A <u>sechii</u> disk will be used to record water transparency and depth.</p> <p><u>Phosphate:</u> To maintain such conditions, mean annual levels of Total Phosphate (TP) should not exceed 25 micrograms per litre within the spring-fed Western and Central Arms. (This is approximately the maximum concentration that appears to be necessary to maintain bristly stonewort). Within the stream-fed Eastern Arm, it may not be possible to attain quite such low levels, but here mean annual levels of TP should not regularly go much above 50 micrograms per litre.</p> <p><u>Nitrate:</u> High nitrogen concentrations cause ecological changes, including growth of surface algal-dominated communities at the expense of macrophytes. Mean annual Total Nitrogen Concentration (TN) is used because plants can utilise N at various stages of the nitrogen cycle. Winter Nitrate is a measure of nitrate loading to the lake and is correlated with aquatic plant species richness.</p>	<p><u>Phosphate:</u> <u>Upper limit:</u> In the Central Arm, Western Arm and Central Lake, mean annual levels of Total P, (measured at regular lake sampling points F, G, M and Z) should be 25 micrograms per litre or less. In the Eastern Arm, mean annual levels of Total P (measured at regular lake sampling points C and D) should be <50 micrograms per litre.</p> <p><u>Nitrate:</u> <u>Upper limit:</u> Mean annual levels of Total N and Winter Nitrate, measured at regular lake sampling points should <1 mg/ltr at all sampling points.</p> <p>Water Transparency (clarity) Lower limit: Water clarity at regular lake sampling points should be >95% (measured by <u>sechii</u> disk).</p>
F2. Hydrology (Natural fluctuations in water levels)	<p>Natural leakage (out of the lake-bed and shoreline) is probably the largest and most difficult issue to deal with. There are several known and probably a considerable number of unknown leaks, in the system. This is due to the Karstic nature of the limestone in this area and its numerous associated joints and fissures.</p> <p>A key area of work needed is to try and identify where such leakage is occurring and to determine if it is possible to seal such locations. However, many of these locations also allow clean ground water into the lake and so attempts to seal them would be highly detrimental! Monitoring water levels and studying the geomorphological processes will therefore be very important to help develop future management decisions.</p>	<p><u>Upper limit:</u> None set. Existing weirs and dams and the height of the lake outlet channel dictate maximum water levels. Attempts to raise levels would necessitate raising footpaths to prevent regular flooding. Lower limit: Central Arm should not fall below a low summer level of c. 4.7 metres O.D.</p>

Performance indicators for factors affecting the feature (cont.d)		
Factor	Factor rationale and other comments	Operational Limits
F2. Hydrology (<i>Natural fluctuations in water levels</i>) (cont.d)	In the longer term, sea level may rise, if so inevitably freshwater in the lower lakes will be more regularly displaced by saline conditions. Ultimately, the freshwater system may retreat and new management policies will have to be considered. In any such event the Conservation Objectives for this feature will obviously have to be revised. Water levels will be measured by existing gauge boards at key locations and by in lake depth sensors linked to data loggers.	This is measured at standard gauge board sampling point D; Western Arm and Central Lake should not fall below a low summer level of 4.3 metres (OD). This is measured at standard gauge board sampling points C and F.
F3. Hydrology (<i>Anthropogenic influences - ground-water abstraction</i>).	Groundwater abstraction in this area is currently exempt from licensing and so there is no regulatory control. At present there is insufficient information on the number of abstraction points and volumes being abstracted. The Environment Agency (EA) Catchment Abstraction Management Strategy (CAMS) assessment for the Bosherton lakes catchment, within CAMS Unit GWMU1 indicates that “known” abstractions are not having a discernible impact on the lake levels. Leakage from the base of the lakes is the main cause of falling water levels. The EA initially classified GWMU1 as ‘water available’ in the CAMS consultation document. They also stated that under any future licensing strategy (once the groundwater exemption is removed) they would propose to stay at ‘water available’. During the consultation period, concerns were raised about water loss from Bosherton Lakes and that presenting this groundwater unit as ‘water available’ may encourage abstraction in the area, thus exacerbating the problem and possibly affecting both the conservation value of the lakes as well as impacting upon the local economy, in view of the visitors attracted to the area because of the lakes. Having considered responses on this GWMU the EA feel it would be appropriate in this case to override the resource availability status to ‘no water available’ to avoid confusion.	<u>Upper limit:</u> Three water abstraction boreholes are known within or on the edge of the theoretical aquifer in the catchment. This should be the maximum number permitted. <u>Lower limit:</u> Abstraction in the catchment should be regulated and the current ground water abstraction status should remain ‘no water available’
F4. Sediment Load	Suspended sediments, transporting nutrients from adjacent land outside the SAC/SSSI boundary flow into the lakes via streams. As well as exacerbating existing eutrophication problems, gradually this is progressively filling in the lake system. Although it may be difficult to achieve, methods of reducing local soil erosion within the catchment should be investigated.	<u>Upper limit:</u> None set. <u>Lower limit:</u> Sediment load deposition in Western and Central Arms and Central Lake should be from natural deposition of Chara and other submerged macrophytes < 0.5 cm per year (approx).

Performance indicators for factors affecting the feature (cont.d)		
Factor	Factor rationale and other comments	Operational Limits
F4. Sediment Load (cont.d)	<p>CCW will continue to work with others to examine existing land-use practices, to try and combat and slow down this process. Existing silt-traps outside the SAC/SSSI boundary should continue to be used and maintained to reduce silt loadings. The rate of sediment deposition should be measured to assess the results of such management.</p> <p>A balance should be kept between open water and swamp/fen communities. For some areas of the lake, such as the upper eastern and upper western arms, consideration should be given to open up swamp communities to maintain deeper open water conditions. A <u>sechii</u> disk will be used to record water clarity and depth. Repeat bathymetric surveys will be needed to record changing sediment depths.</p>	The water column in these embayments should remain clear at all times.
F5. Fishery management	Large populations of coarse fish (such as introduced roach for example) can distort the balance between the plant community, nutrient levels and the coarse fish population by eating small microscopic animals (zooplankton) that feed on tiny algae (phytoplankton).	<p><u>Upper limit:</u> None set.</p> <p><u>Lower limit:</u> Ensure predatory species (e.g. pike populations) are maintained including adequate breeding habitat for pike to control roach population. Ensure no further fish species introductions – there should be no use of live bait.</p>
F6. Introduced alien/exotic species	Terrapins (from the 1980s ninja-turtle era) have arrived in Bosherton Lakes since the early 1990s, as a result of deliberate introduction. So far one has been caught and removed. <i>Azolla</i> (water fern) has occurred in a silt-trap pool intercepting water flowing into the lakes Eastern Arm. So far, other potentially rampant species have yet to appear, though several species occur in other south Pembrokeshire freshwater bodies. As well as being illegal, such activities run the risk of introducing disease or affecting the ecological balance of the site. The potential for further accidental or deliberate introductions of alien/exotic species, is quite high - given the volume of people that visit the lakeside area each year. Vigilance (through regular contact with the public) is necessary to try and minimise this potential problem.	<p><u>Upper limit:</u> None set.</p> <p><u>Lower limit:</u> Unpredictable and currently none set.</p> <p>Maintain vigilant regular routine site inspections and wardening, plus publicity and signs.</p>

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F7. Changes in access and recreation	<p>Bosherston lakes and lakeside footpaths have a high recreational and educational interest and landscape value. Increases in access and recreation pressures may cause erosion of bank-side vegetation, disturbance to other features through and deposition of litter (e.g. fishing line/hooks etc). Fishing points should be maintained regularly to prevent fishing debris becoming entangled in lakeside vegetation and posing a potential threat to other SAC features (i.e. otters).</p> <p>It will be essential to maintain links with, the National Trust and other partner organisations (e.g. Pembrokeshire Outdoor Charter Group) to monitor visitor pressure and ensure that adequate steps are in place to regulate and protect potentially sensitive species and communities. Close contact with the local community is also important to encourage interest in the site and to explain management issues that have to be tackled.</p>	<p><u>Upper limit:</u> None set.</p> <p>Lower limit: Due to the high conservation value of Bosherston Lakes there should be a strong presumption in favour of maintaining a closed fishing season (currently still being managed from mid March to mid June).</p> <p>Maintain regular routine site inspections and wardening.</p>

4.2 Conservation Objective for Feature 2: Greater horseshoe bat *Rhinolophus ferrumequinum* (EU Species Code: 1304)

Vision for feature 2

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The greater horseshoe bat population will be capable of maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of greater horseshoe bats will neither be reduced nor will be likely to be reduced for the foreseeable future, and
- There will be sufficient habitat to maintain its populations on a long-term basis.
- At least three SSSI maternity roosts will be occupied annually by adult greater horseshoe bats and their babies:
 - Stackpole Courtyard Flats and Walled Garden SSSI
 - Slebech Stable Yard Loft, Cellars and Tunnels SSSI
 - Felin Llwyngwair SSSI
- Carew Castle SSSI will continue to be used as an intermediate greater horseshoe bat roost, during the spring and autumn, as a male summer roost and an autumn/spring mating roost.
- The greater horseshoe bat population at the component SSSI's will be stable or increasing.
- There will be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Breeding population roost distribution	<p>Systematic counts of adults and young of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p>Units 2a, 3a, 4 and 5</p> <p>There should be at least three maternity roosts occupied annually by adult females and their babies.</p> <p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> Breeding recorded at:</p> <ul style="list-style-type: none"> • Stackpole Courtyard Flats and Walled Garden SSSI; • Slebech Stable Yard Loft, Cellars and Tunnels SSSI; • Felin Llwyngwair SSSI
A2. Winter and intermediate population roost distribution	<p>Systematic counts of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC.</p> <p>In addition, there are quite regular cumulative records from intermediate roosts and hibernacula in CCW West Wales Region. These data provide valuable indication of population distribution of both horseshoe bat species across much of the region.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p>Units 2b, 3b, 4 and 5</p> <p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> Bats should be present, utilising known winter roosts within:</p> <ul style="list-style-type: none"> • Stackpole Courtyard Flats and Walled Garden SSSI; • Slebech Stable Yard Loft, Cellars and Tunnels SSSI; • Felin Llwyngwair SSSI • Carew Castle SSSI should continue to be used as a intermediate roost during the spring and autumn.
A3. Maternity roost adult population size	<p>Systematic counts of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC. Pembrokeshire Bat Sites and Bosherton Lakes SAC supports approximately 9.5% of the UK greater horseshoe bat population. Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p>Units 2a, 3a and 4 Maternity Roost adult counts:</p> <p><i>Upper limit:</i> None set</p>

<i>Performance indicators for feature condition (cont.d)</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A3. Maternity roost adult population size (cont.d)		<p><u>Lower limit:</u> Based on long-term monitoring data, the combined annual SAC maternity roost population, calculated as a mean during a two-week period in July, should exceed 350 individuals.</p> <ul style="list-style-type: none"> • At Stackpole (unit 2a), the mean number of adults counted leaving the roost should exceed 175 individuals. • At Slebech (unit 3a) the mean number of adults counted leaving the roost should exceed 125 individuals. • At Felin Llwyngwair (unit 4) the mean number of adults counted leaving the roost should exceed 50 individuals.
A4. Maternity roost (productivity)	<p>Systematic counts of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p><u>Units 2a, 3a and 4</u></p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Annual productivity at the combined SAC maternity roost population should exceed 115 babies per year.</p> <ul style="list-style-type: none"> • At Stackpole (unit 2a), at least 60 babies should be born each year. • At Slebech (unit 3a) at least 40 babies should be born each year. • At Felin Llwyngwair (unit 4) at least 15 babies should be born each year.

Performance indicators for feature condition (cont.d)		
Attribute	Attribute rationale and other comments	Specified limits
A5. Intermediate roost and hibernacula population	<p>Total numbers of bats using the intermediate roosts and hibernacula within the SAC are less well known. At Carew Castle, for example, counts made are limited to regular evening visits but are not continuous. So numbers of bats visiting or passing through the castle at various times may be under-recorded. At hibernacula only infrequent visits are made to count bats present, in order to minimise disturbance and potential damage to roosting bats present.</p> <p>Greater horseshoe bats should continue to be able to use these roosts for the whole range of ecological functions they currently provide, (e.g. for hibernating and mating purposes) if they need to.</p> <p>Systematic counts of both Horseshoe bat species should continue to be carried out annually at the relevant component SSSI. If possible, automatic counters should be installed to improve the efficiency of counts of bats entering or leaving roosts. Horseshoe bat records should continue to be held in Recorder 2002 (or 6) and in MapInfo GIS.</p>	<p><u>Units 2a, 2b, 3a, 3b and 5 (Stackpole, Slebech and Felin Llwyn-gwair SSSI)</u></p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u></p> <ul style="list-style-type: none"> • Greater horseshoe bats will continue to be recorded in lofts, cellars and tunnels during the winter months at Stackpole and Slebech; and within the Mill building at Felin Llwyn-gwair. • These bats should continue to utilise a range of roost sites available to them with regular evidence of presence of bats and/or other evidence, e.g. fresh or very recent droppings. • There should be no physical deterioration in, or disturbance of, roosts available to the bats. <p><u>Unit 4 (Carew Castle SSSI)</u></p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> The number of day roosts available to greater horseshoe bats should be at or above the number recorded in 2006 (13 chimneys). These bats should continue to utilise a range of roost sites – e.g. within the South-west Tower, Perrot’s Wing and the Old Tower – with regular evidence of presence of bats and/or other evidence, e.g. fresh or very recent droppings. Greater horseshoe bats should continue to be able to use any part of the castle and environs unhindered for foraging and night roosting.</p>

<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
<p>F1. Availability of suitable roosts (including roosts out-with the SAC)</p>	<p>Radio-tracking and long-term roost surveillance by bat workers shows that greater horseshoe bats from the SAC population disperse over a very wide geographical area of west Wales, utilising at least 100 known different roosts during the year.</p> <p>Each of these roosts may have a variety of functions - such as being close to favoured feeding areas, used as mating sites, or possibly only used as winter roosts etc). Roost choice and location will also depend on the ambient temperatures each roost provides. The viability of the bat population within the SAC will depend very much on the availability of suitable roosts within a several mile radius of the SAC roosts. This range of different roosts is necessary to maintain populations of these bats, so all the roosts should be kept in a suitable condition for use by them.</p> <p>As with all bat roosts, there should be no modification to the roost, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW. Plans for future improvements to the building will also need prior consultation with CCW but dependent on the owner's wishes, it may be possible to enhance the suitability of the site for bats. CCW staff must be aware of any changes to known and potential roosts, either through deterioration or planning applications and must also be aware of opportunities to create roosts where possible.</p>	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u></p> <ul style="list-style-type: none"> • All existing roosts known to CCW should be maintained and there should be no physical deterioration in or disturbance of these sites, or loss or of roosting opportunity within 1-16 km radius of the key breeding roosts within the SAC. • There should be no modification to roosts, without prior consultation with CCW.

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments (cont.d)</i>	<i>Operational Limits</i>
F2. Availability of bat fly-ways and feeding areas on surrounding land	<p>Greater horseshoe bats require sheltered unlit cover as they leave their roosts to feed at night. Key radial zones are:</p> <p>1km - Vital to retain wooded areas and vegetation cover (including scrub), and habitat links i.e. woodland, tree lines, hedgerows and even limited sections of walls and fences. All woodland and enclosed vegetation with a few hundred metres of each component SSSI roost is likely to be important to the bats. All woodland, wooded watercourses, hedge lined lanes or even small roads are likely to be key features bats use. To cross some open areas bats may use fences or walls but the use is liable to be limited – most likely where habitat features have been removed in the past. The maintenance of cattle grazed pasture around greater horseshoe roosts should be considered vital in this area.</p> <p>1-3km - Important to maintain hedgerow systems, scrub, wetland or marsh areas, and habitat links. Areas of thick hedgerows or scrub adjacent to cattle grazed pasture are likely to be of highest significance. Virtually all areas containing extensive hedgerows (particularly higher overgrown ones), scrub especially surrounding grazed pasture and/ or wet ground will be important bat foraging areas. The maintenance of these significant areas is vital to maintain the bats foraging areas.</p> <p>3-7km -Areas with thick hedgerows around grazed pasture and pronounced habitat links should be maintained, not all areas will be used. A significant proportion of the most pronounced areas of extensive hedgerows (particularly higher overgrown ones), scrub and wet woodland - especially surrounding pasture and or wet ground will be important to the bats.</p>	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> There should be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water. Within woodland, sheltered glades, of up to 10-15m across, should be incorporated along which the bats can commute and feed.</p> <p><u>Up to 1 km from component SSSI:</u> The vegetation immediately around SSSI roosts must be maintained.</p> <p><u>1-16 km from the component SSSI:</u> Extensive hedgerow systems and tree-lined watercourses, linking roosts sites and grassland foraging areas to be retained within up to 16 km of these roosts.</p> <p>Retain cattle-grazed pastures close to the roosts and up to approximately 16 km of the roosts. Where possible, worming products that don't contain avermectins should be used as these deplete the abundance of dung invertebrates.</p>

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments (cont.d)</i>	<i>Operational Limits</i>
F2. Availability of bat fly-ways and feeding areas on surrounding land (cont.d)	<p>7-16km - Only a small part of this area is likely to be used for foraging but flight routes may lead further, connecting to other roost sites. Maintenance of pronounced habitat links through the area will be important. Some of the most pronounced areas of extensive hedgerows (particularly higher overgrown ones), scrub and wet woodland - especially surrounding pasture and or wet ground will be important to the bats. These will be difficult to predict without carrying out radio tracking studies.</p> <p>All zones Sheltered glades, of up to 10-15m across, should also be incorporated along which the bats can feed. Removal of habitat features or increase in night lighting may stop bats from using some routes. Cattle are the most suitable grazers for these grasslands as they produce the best dung for dung beetles, which are among the invertebrates on which the bats feed.</p>	See above
F 3. Disturbance to roosts – e.g. from fumes, lighting or noise	<p>As with all bat roosts, there should be no modification to SSSI component roosts, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW. Plans for future improvements to buildings associated with the roosts also need prior consultation with CCW but dependent on the owner’s wishes, it may be possible to enhance the suitability of roost sites for bats.</p> <p>Disturbance to the bats can also be caused by extra lighting around roost access points. This may have an effect on the numbers of bats emerging at dusk. There will be a need to maintain liaison with SSSI roost owners and occupiers over these potential issues, taking account of their wishes.</p>	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Ensure proposed changes to existing lighting schemes are discussed with CCW and that if lighting has to be used that it is suitably located and downward pointing to minimise the amount of stray light falling on bat access points and flight-lines. Ensure changes to existing systems, such as fire alarms fitted to rooms or buildings close to component SSSI roosts are discussed with CCW and that such equipment takes account of frequencies that may be potentially damaging or irritating to bats. There should be no use of chemicals or storage of chemicals in bat roosts, without prior consultation with CCW.</p>

4.3 Conservation Objective for Feature 3: Lesser Horseshoe Bat *Rhinolophus hipposideros* (EU Species Code: 1303)

Vision for feature 3

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The Lesser horseshoe bat population will be capable of maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of lesser horseshoe bats will be neither being reduced nor will be likely to be reduced for the foreseeable future, and
- There will be sufficient habitat to maintain its populations on a long-term basis.
- At least four SSSI maternity roosts will be occupied annually by adult lesser horseshoe bats and their babies:
 - Beech Cottage, Waterwynch SSSI,
 - Orierton Stable Block and Cellars SSSI,
 - Park House Outbuildings SSSI,
 - Stackpole Courtyard Flats and Walled Garden SSSI
- The lesser horseshoe bat population at the component SSSI's will be stable or increasing.
- There will be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 3

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Breeding population roost distribution	<p>Systematic counts of adults and young of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p><u>Units 2a, 6, 7 and 8</u></p> <p>There should be at least four maternity roosts occupied annually by adult females and their babies.</p> <p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> Breeding recorded at:</p> <ul style="list-style-type: none"> • Stackpole Courtyard Flats and Walled Garden SSSI; • Beech Cottage, Waterwynch SSSI; • Orierton Stable Block and Cellars SSSI; • Park House Outbuildings SSSI

Performance indicators for factors affecting the feature (cont.d)		
Factor	Factor rationale and other comments	Operational Limits
A2. Winter and intermediate population roost distribution	<p>Systematic counts of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC. In addition, there are quite regular cumulative records from intermediate roosts and hibernacula in CCW West Wales Region. These data provide valuable indication of population distribution of both horseshoe bat species across much of the region.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p><u>Units 2b, 5, 6, 7 and 8</u></p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Bats should be present, utilising known winter roosts within:</p> <ul style="list-style-type: none"> • Stackpole Courtyard Flats and Walled Garden SSSI; • Slebech Stable Yard Loft, Cellars and Tunnels SSSI; • Orielton Stable Block and Cellars SSSI. • At Carew Castle SSSI, lesser horseshoe bats should continue to utilise a range of roost sites within the castle.
A3. Maternity roost adult population size	<p>Systematic counts of both Horseshoe bat species are carried out annually at the relevant component SSSI supporting the SAC.</p> <p>Horseshoe bat records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p><u>Units 2a, 6, 7 and 8</u></p> <p><u>Adult counts at Maternity roosts</u></p> <p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> The combined annual SAC maternity roost population, calculated as a mean during a two-week period (from late May to mid June), should exceed 330 adults.</p> <ul style="list-style-type: none"> • At Stackpole (unit 2a), the mean number of adults counted leaving the roost should exceed 100 individuals. • At Orielton (unit 6) the mean number of adults counted leaving the roost should exceed 100 individuals. • At Beech Cottage (unit 7) the mean number of adults counted leaving the roost should exceed 100 individuals. • At Park House (unit 8) the mean number of adults counted leaving the roost should exceed 30 individuals.

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Availability of suitable roosts, including roosts out-with the SAC	<p>As for greater horseshoe bat.</p> <p>Quite a large number of additional lesser horseshoe bat roost sites are known throughout west Wales. But very few bats have actually been recorded at these sites, following their dispersal from summer breeding roosts (including designated SSSI and undesignated breeding sites). Outside the breeding season, the whereabouts of the bulk of the lesser horseshoe bat population is unknown. Research elsewhere suggests that they may forage and roost over distances up to several km from their summer breeding roosts.</p>	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> All existing roosts known to CCW should be maintained and there should be no physical deterioration in or disturbance of these sites, or loss or of roosting opportunity within 1-7 km radius of the key breeding roosts within the SAC.</p> <p>There should be no modification to roosts, without prior consultation with CCW.</p>
F2. Availability of bat fly-ways and feeding areas on surrounding land	<p>Lesser horseshoe bats require sheltered unlit cover as they leave their roosts to feed at night. Key radial zones are:</p> <p>1 km - As for greater horseshoe bats. Plus, the maintenance of damp/ wet ground around roosts should be considered vital in this area.</p> <p>1-3km - Hedgerows adjacent to semi improved damp or wet ground are likely to be of highest significance.</p> <p>3-7km - Lesser horseshoe bats: only liable to be important for some of the larger colonies of bats, maintain habitat links through the areas.</p> <p>All zones As for greater horseshoe bat.</p>	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> There should be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water.</p> <p><u>Up to 1 km from component SSSI:</u> The vegetation immediately around SSSI roosts must be maintained.</p> <p><u>1-7 km from the component SSSI:</u> Extensive hedgerow systems and tree-lined watercourses, linking roosts sites and grassland foraging areas to be retained.</p>
F 3. Disturbance to roosts – e.g. from fumes, lighting or noise	As for greater horseshoe bat	<p><u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> As for greater horseshoe bat.</p>

4.4 Conservation Objective for Feature 4: Otter *Lutra lutra* (EU Species Code: 1355)

Vision for feature 4

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The Otter population will be capable of maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of otters will neither be reduced nor will be likely to be reduced for the foreseeable future, and
- There will be sufficient habitat to maintain its populations on a long-term basis.
- The otter population will be stable or increasing.
- There will be a sufficiently large area of suitable habitat to support an otter breeding population, including:
 - Open water with sufficient food resources (notably eels and other fish species) and
 - a continuous network of undisturbed sheltered resting places along the lake shoreline – including swamp, broadleaved woodland and calcareous scrub.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 4

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
<p>A1. Otter population extent</p> <p>(Population being maintained or increasing)</p>	<p>Bosherston Lakes is a well-studied site, with good baseline information on otters, habitat use and preferences for sprainting, resting and breeding.</p> <p>Target PIs for spraint density are based on 1980/81 (Henshilwood, 1981) and 1987 (Pyke, 1988) baseline survey data from whole lake shoreline). Presence of an otter population can be deduced by regular presence of fresh or recent spraint. This attribute will be determined through examination of sprainting activity. As a minimum this will be through survey, approximately once every two months, of 12 mapped sampling locations, supporting a minimum total of 38 known/potential sprainting sites. Otter spraint records are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p><u>Units 1a, 1b and 1c</u></p> <p><u>Sprainting activity and density:</u></p> <p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i></p> <ul style="list-style-type: none"> • A minimum of 10 positive sprainting sites per km; • At least 20% of spraints should be recent or fresh.
<p>A2. Otter breeding activity</p>	<p>Target PIs for holt occupancy are based on 1980/81 (Henshilwood, 1981) and 1987 (Pyke, 1988) baseline survey data from whole lake shoreline).</p> <p>Reliable reports of otter presence (e.g. live sightings, otter families and behaviour indicative of breeding) are obtainable, due to on site presence of CCW and NT staff and records from visitors. Holt occupancy is to be determined through annual lake-shoreline survey.</p>	<p><u>Units 1a, 1b and 1c</u></p> <p><u>Holt occupancy:</u></p> <p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> Continued presence of at least three potential breeding holts.</p>

Performance indicators for feature condition (cont.d)		
Attribute	Attribute rationale and other comments	Specified limits
A2. Otter breeding activity (cont.d)	<p>Productivity/population size is to be based on observations of otters within the lakes and confirmation of signs of breeding at known/suspected breeding holts.</p> <p>Locations of otter holts and sightings are held in Recorder 2002 (6) and in MapInfo GIS.</p>	<p>Productivity/Population size: <u>Upper limit:</u> None set</p> <p><u>Lower limit:</u></p> <ul style="list-style-type: none"> • Presence of at least one adult female and one cub in one year out of three successive years; <p><u>or</u></p> <ul style="list-style-type: none"> • Evidence that a breeding holt was occupied (confirmed by bedding at the entrance) and/or adult behaviour, and that breeding was therefore attempted.
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Food availability	<p>Without good food availability, breeding may not occur. Previous studies indicate that eels form a high proportion of the otter diet at Bosherton Lakes and that Cyprinids may also be important in their diet.</p> <p>Elver runs are noted each Spring and it is possible to confirm typical local prey items in remains found at feeding sites and in spraint analyses. A suitable but simple fish population monitoring method has still to be developed.</p>	<p><u>Units 1a, 1b and 1c</u> <u>Upper limit:</u> None set</p> <p><u>Lower limit:</u></p> <ul style="list-style-type: none"> • Evidence of continuing eel presence (including regularly observed elver migration into Bosherton Lakes) and presence of regular shoals of Coarse fish species within the lake system. • Confirmation of typical local prey items in remains found at feeding sites and in spraint analyses.
F2. Anthropogenic mortality	<p>Otter deaths, e.g. from road casualties, can have a considerable bearing on the structure and viability of the resident population. However, otters may die beyond the SAC/SSSI boundary and may not be seen and recorded. This “factor” is subject to chance events, so is not easy to measure in a regular standardised way.</p>	<p><u>Units 1a, 1b and 1c</u> <u>Upper limit:</u> None set</p> <p><u>Lower limit:</u> Not more than one in any five years, with no observable impact on the overall otter population or breeding performance.</p>
F3. Water quality/water quantity and sediment load	<p>See Bosherton lakes open water factors above</p>	<p>See Bosherton lakes open water factors above</p>

Performance indicators for factors affecting the feature (cont.d)		
Factor	Factor rationale and other comments	Operational Limits
F4. Freshwater availability (Including for rinsing sea salt from fur)	Otters from the freshwater Bosherton Lakes system are known to swim and hunt for food along the nearby coastline within the contiguous Pembrokeshire Marine SAC. Otter is also a feature of the Pembrokeshire Marine SAC. Evidence of use of the marine environment will be from spraint surveys, plus direct observation.	Units 1a, 1b and 1d <u>Upper limit:</u> None set <u>Lower limit:</u> No reduction in the availability of freshwater
F5. Fishery management	Without good food availability, breeding may not occur. Previous studies indicate that eels form a high proportion of the otter diet at Bosherton Lakes and that Coarse fish species may also be important in their diet. There should be a presumption against developing an eel/elver fishery at the lakes or to removal of the closed season to favour management of habitat suitable for fish and for otters. Data from fishing permits will provide the main means of recording fishery management.	<u>Upper limit:</u> None set. <u>Lower limit:</u> Minimise impact to eel/elver fishery: maintain a closed fishing season (currently from mid March to mid June) to limit disturbance to natural bank-side vegetation. Regularly maintain approved fishing points along the shoreline of the Eastern Arm, Western Arm and Central Lake only, to prevent fishing debris becoming entangled in lake-side vegetation and posing a potential threat to otters etc. As now, there should be no fishing points created on the eastern side of the eastern arm, at the One Arch Pond, in the Central Arm or upper western arm (above Bosherton Causeway) where there are important otter resting places.
F6. Availability of undisturbed resting places	Otters require a wide range of lying-up (holt) options within a large territory. These provide secure, undisturbed conditions for the male otter; the female (with or without her cubs); for the cubs (with or without their mother); and for the weaned and independent immatures. Much of the lakes extensive shoreline is relatively inaccessible and undisturbed, and so provides many potentially excellent lying up areas for otters. Evidence of their use will be from spraint density surveys of potential sites, plus direct observation of otter behaviour from shoreline paths, bridges and causeways.	<u>Upper limit:</u> None set. <u>Lower limit:</u> Maintain current extent of relatively undisturbed shoreline woodland and dense scrub, together with associated root holes and crevices (including fallen trees and root-plates). Maintain natural cave-like holes in the rocky shoreline and in hollow decaying tree trunks close to the shore. Maintain natural reed/swamp vegetation, especially in: One Arch swamp (NNR compt 30); top of the eastern arm (compt 31); Central lake shore (compt 32); Mere Pool (compt 33).

<i>Performance indicators for factors affecting the feature (cont.d)</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F7. Changes in lakeside recreation pressures	<p>Lakeside recreation is mainly restricted to various connecting paths around the western arm and central lake, and the western side of the eastern arm. People counters at specific points will be the main means of assessing changes in visitor pressure.</p> <p>It will be essential to maintain links with partner organisations, including National trust, Pembrokeshire Coast National Park Authority, plus members of the Pembrokeshire Outdoor Charter Group and Pembrokeshire Coastal Forum) to ensure that adequate steps are in place to regulate and protect potentially sensitive zones used by otters.</p> <p>Close contact with the local community will also be important to encourage interest in the sites features, and to explain management issues affecting otters etc.</p>	<p><u>Upper limit:</u> Maintain the existing policy of “no human access” to the Central Arm and to the eastern side of Eastern Arm, where there are important otter resting and breeding places. Maintain a closed fishing season (currently from mid March to mid June) to limit disturbance to natural bank-side vegetation. Regularly maintain approved fishing points along the shoreline of the Eastern Arm, Western Arm and Central Lake only, to prevent fishing debris becoming entangled in lake-side vegetation and posing a potential threat to otters etc.</p> <p><u>Lower limit:</u> None set.</p>

5. ASSESSMENT OF CONSERVATION STATUS AND MANAGEMENT REQUIREMENTS

This part of the document provides:

- A summary of the assessment of the conservation status of each feature.
- A summary of the management issues that need to be addressed to maintain or restore each feature.

5.1 Conservation status and management requirements of Feature 1: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp./Calcium-rich nutrient-poor lakes, lochs and pools.

Conservation status: Unfavourable: declining.

Surveillance of Bosherton Lakes has been regular and ongoing since initial extensive research and survey work carried out between 1977/78 (when Stackpole NNR, of which the lakes are a part, was established) and 1983/89. Surveillance and monitoring projects for the lake features have been developed within a management plan for Stackpole NNR/SSSI (within CMS). Quite detailed records are kept of most of the attributes considered important for measuring the condition of these features. Water quality, hydrology and submerged macrophyte surveillance has been undertaken for about 30 years. Physical and biological data are held in Excel spreadsheets in the Stackpole office; biological data are also held in Recorder.

Repeat measurements of macrophytes and *Chara* species are made along standardised transects, utilising standardised recording methods employed since 1977 (CMS Project RF03/04 in the NNR/SSSI management plan). Latest results (2006 and 2007) indicate that whilst *Chara* maintained its target condition in the Central and Western Arms, it has failed to meet the desired target condition in the Central Lake where this area has recently become dominated by combinations of blanket weed algae *Cladophora* species/ ivy-leaved duckweed *Lemna trisulca* and spiked water milfoil *Myriophyllum spicatum*. Negative indicator species, notably *Cladophora*, combined with large quantities of *Lemna trisulca* have become established relatively recently, and are now often dominant or co-dominant with *Chara* in some areas.

Water quality targets (e.g. Total Phosphorus) from standardised sampling points, analysed under contract by the Environment Agency (CMS project RP14/01) appear generally to be being met in the Central and Western Arms. Overall, Total P has declined during the last c. 30 years – helped by improvements to water quality upstream of the lake system. However, the Central Lake samples produced higher failure rates and just failed to meet overall target condition. Lake pH target levels have been maintained in all sections.

Nitrogen and Ammonia levels are not showing significant rise, in recent years though are persistently above the upper limit of 1 milligram per litre within the Eastern Arm, Western Arm and Central Lake.

Lake levels fluctuate widely, often becoming very low in dry years within the Central Lake and the Western Arm during late summer. Water leaks away due to mainly natural processes, notably through probably quite numerous limestone fissures. Warm, shallow water, may have been a contributing factor aiding algal and *Lemna trisulca* growth and overall dominance in the Central Lake and parts of the Western Arm. (CMS Project RP14/02).

Sediment load levels can be excessive, with an average of >1 cm of sediment per year in the upper western Arm, determined from sediment build-up around the causeway and gauge board over the last c. 30 years. Combined with low water levels, current rates of sediment disposition (including from algal and macrophyte die-back) are currently still probably increasing. Silt loading in the stream-fed eastern Arm is also usually high during and after heavy rainfall in most winters, although silt-trap pools are collecting large volumes each year.

Management requirements

Water quality – nutrient enrichment: Significant work has been achieved with partners (such as the Environment Agency) to reduce the effects of point sources of nutrients on Bosherton Lakes. **Key** nutrients have been monitored regularly at standardised sampling points. Although it should be possible to manage identified point sources (i.e. Sewage inputs to streams) it is less easy to identify and manage diffuse sources. To achieve the necessary nutrient limits, it will be necessary to identify and then curb diffuse sources of nutrient enrichment.

Water quantity – water loss through natural leakage out of the lakebed and shoreline, is probably the largest and most difficult issue to deal with. There are several known and probably a considerable number of unknown leaks, in the system. This is due to the Karstic nature of the limestone in this area and it's numerous associated joints and fissures. A key area of work needed is to try and identify where such leakage is occurring and then to determine if it is possible to seal such locations. In the longer term predictions are that sea level may rise, if so inevitably freshwater in the Central Lake/Western Arm will be more regularly displaced by saline conditions. Ultimately, the freshwater system may retreat and new management policies will have to be considered. Monitoring water levels and studying climatic and hydro-geomorphological processes, in tandem with monitoring of water quality and hydrology, will therefore be very important to help develop future management decisions.

Lake siltation: nutrient-enriched suspended sediments, from adjacent land outside the SSSI flow into the lakes via streams. Gradually this is progressively filling in the lake system. Although it may be difficult to achieve, methods of reducing local soil erosion within the catchment should be investigated. This will require working with other partners (e.g. Environment Agency and landowners), to examine existing land-use practices, to try and combat and slow down this process. Existing silt-traps outside the SSSI boundary should continue to be used and maintained to reduce silt loadings. The rate of sediment deposition should be measured to assess the results of such management. A balance should be kept between open water and swamp/fen communities. For some areas of the lake, such as the upper eastern and upper western arms, consideration should be given to open up swamp communities to maintain deeper open water conditions. Repeat bathymetric surveys will be needed to record changing sediment depths.

Aquatic aliens - terrapins (from the 1980s ninja-turtle era!) appeared in Bosherton Lakes during the 1990s, as a result of deliberate introduction. So far one has been caught and removed. Exotic water plants such as *Azolla* (water fern) or other potentially rampant species have, so far, not appeared; though *Azolla* has turned up in one of the sit-trap pools feeding the lakes, from where it was mechanically removed in late summer 2005. Vigilance is necessary to try and minimise this potential problem.

Access and recreational pressures: Access and recreation pressures are fairly well regulated by on site wardening and information, so rare or sensitive species are reasonably well protected. However, changes in access and recreation trends such as increases in visitor numbers, or new developments, could potentially impact site features in some way, such as altering the viability of populations of communities and species in some areas.

Due to the high conservation value of Bosherton Lakes there should be a strong presumption in favour of maintaining a closed fishing season (currently still being managed from mid March to mid June). Fishing points should be maintained regularly to prevent fishing debris becoming entangled in lake-side vegetation and posing a potential threat to otters or birds. It will be essential to maintain links with partner organisations, (such as Pembrokeshire Outdoor Charter Group) to monitor visitor pressure and ensure that adequate steps are in place to regulate and protect potentially sensitive species and communities. Close contact with the local community is also important to encourage interest in the site and to explain management issues that have to be tackled.

5.2 Conservation status and management requirements of Feature 2: Greater horseshoe bat *Rhinolophus ferrumequinum*

Conservation status: Favourable: maintained.

This is supported by systematic counts of greater horseshoe bats carried out annually at the relevant component SSSI supporting the SAC.

This includes:

- Annual productivity at all three Pembrokeshire nursery roosts (Stackpole Courtyard Flats and Walled Garden SSSI; Slebech Stable Yard Loft, Cellars and Tunnels SSSI and Felin Llwyngwair SSSI);
- Adult counts at all three nursery roosts, approx at the time of parturition (from late June to mid July);
- Counts by automatic recorders at the same sites;
- Annual surveillance at Carew Castle roosts.

In addition, there are quite regular cumulative records from many other intermediate roosts and hibernacula in CCW West Wales Region (including Pembrokeshire, Carmarthenshire and Gower). These data (collated by CCW) also provide valuable indication of population distribution and extent of greater horseshoe bats across much of the region. Records of greater horseshoe bats, from various surveys/sources, are held in Recorder at CCW Stackpole office, with additional roost location data held in GIS. Regular surveillance over the last six years up to December 2007, indicate that the greater horseshoe bat population within the SAC is above the lowest conservation limits set, and known potentially limiting factors appear to be under control.

Management requirements

Greater horseshoe bats use a wide range of roosts during the year. These include breeding (nursery roosts) and other intermediate roosts within the component SSSI. In addition the bats use a considerable number of additional identified but unscheduled roosts up to at least 10 km from the breeding roosts. This range of different roosts is necessary to maintain populations of these bats; therefore, all the roosts should be kept in a suitable condition for their use.

Each roost provides a range of microclimates, which means that the bats have several roosting opportunities that are favoured depending on ambient temperatures. The microclimates are generally maintained as the structural integrity of the roost is maintained. Any changes to the structural condition of any of the roosts, either intentionally or as a result of deterioration in the structure, may reduce their suitability as a roost for the bats.

The viability of the bat population will depend very much on the availability of a range of suitable roosts in the area. Therefore CCW staff must be aware of any changes to known and potential roosts, either through deterioration or planning applications and must also be aware of opportunities to create roosts where possible.

Maintenance and repair works: As with all bat roosts, there should be no modification to the roosts, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW.

Availability of bat fly-ways and feeding areas on surrounding land: Greater horseshoe bats require sheltered unlit cover as they leave the roosts to feed at night. Areas of areas of grassland and woodland nearby are important feeding grounds for the bats. This diversity of habitats should be maintained so as to provide a wide variety of invertebrates including large beetles and large moths etc upon which the bats feed. Larger woodland areas close to maternity roosts should be managed to include broad rides, including existing identified tracks and pathways along which the bats currently fly. Trees and branches that connect with wider networks of trees and hedgerows should be retained in order to

provide bat flyways. Sheltered glades, of up to 10-15m across, should also be incorporated along which the bats can feed. Small scale planting of broad leaved woodland and hedges should be carried out to enhance this network. Owing to the distances that these bats can travel, changes in land management at considerable distances from the site could have implications for these bats. In order to enhance the diversity of feeding grounds around the roosts, a shift away from improved pasture and arable land in favour of semi-natural grasslands would improve the abundance and quality of food available to the bats. Cattle are the most suitable grazers for these grasslands as they produce the best dung for dung beetles. If possible worming products that don't contain ivomectins should be used as these deplete the abundance of dung invertebrates.

Disturbance from lighting or noise: Disturbance to the bats can be caused by extra lighting around the roost access points and by human noise. This may have an effect on the numbers of bats emerging at dusk. CCW should liaise with the roost owners over any possible changes that may affect bat access.

5.3 Conservation status and management requirements of Feature 3: Lesser Horseshoe Bat *Rhinolophus hipposideros*

Conservation status: Favourable: maintained.

This is supported by systematic counts of lesser horseshoe bats are carried out annually at the relevant component SSSI supporting the SAC. This includes:

- Annual adult counts at all four SSSI component nursery roosts (Beech Cottage, Waterwynch SSSI, Orierton Stable Block and Cellars SSSI, Park House Outbuildings SSSI and Stackpole Courtyard Flats and Walled Garden SSSI); undertaken between late May and the first half of June. These counts can be compared with similar counts at other Pembrokeshire nursery roosts during the same period.
- Counts by automatic recorders at Stackpole and Beech Cottage;

In addition, there are quite regular cumulative records from many other intermediate roosts and hibernacula in Pembrokeshire. These data (collated by CCW) also provide valuable indication of population distribution and extent of lesser horseshoe bats across much of the Pembrokeshire district. Records, from various surveys/sources, are held in Recorder at CCW Stackpole office, with additional roost location data held in GIS. Regular surveillance over the last six years up to December 2007, indicate that the lesser horseshoe bat population within the SAC is above the lowest conservation limits set, and known potentially limiting factors appear to be under control.

Management requirements

The SSSI roosts supporting these bats will need to be maintained regularly, to ensure that roost fabric does not deteriorate. The bats are also dependant on other roosts up to 10 km away from the component SSSI. These are not so well studied nor so well protected, though many may be important intermediate roosts (linked to feeding, natural dispersal or mating) or hibernacula requirements for a larger metapopulation. All known roosts and sites with suitable characteristics up to 10 km from the SSSI should be checked for bats when possible, and flagged up to the planning authorities to ensure appropriate mitigation in any unforeseen future development. There should be a sufficiently large area of suitable habitat surrounding these roosts to support this population, including continuous networks of sheltered, dense broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water.

5.4 Conservation status and management requirements of Feature 4: Otter *Lutra lutra*

Conservation status: Unfavourable: declining.

Monitoring of otter at Bosherton Lakes relies on two methods,

- i. Estimation of adult presence based on spraint evidence and sightings of otters,
- ii. Direct observation of cubs to determine positive breeding and productivity.

Although adult or full-grown otters were seen each year, recent records suggest a decline in activity within the lake system and some uncertainty over breeding success during 5 of the last 7 years. No cubs were recorded in 2001, 2002, and 2004 and there was no definite evidence of breeding in 2005 and 2006, though it is likely cubs were reared in 2003 and in 2007. The number of positive spraint sites and spraint site density also gradually fell during the period. This may be linked to the high mortality rate recorded in 2001, which included the loss of at least a resident breeding female and one other adult at that time.

Bosherton Lakes are a particularly well-watched site. The perceived declines in otter activity from this surveillance project mirrored observed changes in otter behaviour by CCW and NT staff, and reports from members of the public. Surveillance data available between 1999-2007 measured against the limits set by the Performance Indicators, developed in 2006, show an apparent decline in otter behaviour, low productivity since 2000 with intermittent breeding activity.

Use of a small number of standardised spraint sampling areas, representing less than 10% of the entire lake shoreline, may not be the ideal way of measuring otter use at the site but did appear to reflect real changes in activity during the seven year period. It may simply be the case that the current adult breeding female otter at Bosherton Lakes has moved into a part of the lake system that is more difficult to observe (e.g. Central Arm) or is perhaps also more active at night. It is also not known if low lakes levels and dense algal mats experienced in most summers now are affecting feeding behaviour or an ability to sustain cubs. This requires further research.

Geoff Lyles (pers comm.) has noted that there have been declines in otter activity and productivity at some riverine sites he has observed in west Wales during this review period. He has also noted increased badger activity at some well-recorded otter holt sites. Similar general observations have been noted at Bosherton, where signs of badgers are also very numerous now, and new badger setts have been found near the lakes. This could suggest that some possible changes in otter behaviour may be directly linked to an increase in badger activity – possibly even including predation by badgers? This aspect requires more research.

Management requirements

Availability of suitable lying up sites for otters: otters require a wide range of lying-up (holt) options within a large territory. These provide secure, undisturbed conditions for the male otter; the female (with or without her cubs); for the cubs (with or without their mother); and for the weaned and independent immatures. Much of the extensive lake shoreline is relatively inaccessible and undisturbed, and so provides potentially excellent lying up areas for otters. Adequate provision of suitable lying up areas should be achievable, by maintaining the current extent of shoreline woodland and dense scrub, together with associated root holes and crevices (including fallen trees and root-plates). Several natural cave-like holes in the rocky shoreline and in hollow decaying tree trunks close to the shore are important “otter features”. Reedbeds, at the head of the lake system and on the shore of the central lake also provide good cover for lying up or feeding. It will be important to continue to maintain key areas of cover with minimal disturbance and to determine if there are important areas within the lake system being used by breeding otters that are currently unknown or under-recorded.

A detailed study of otter breeding and otter use at Bosherton Lakes is required to discover the major factor(s) likely to be affecting their poor breeding performance at the site and to identify what further conservation actions are needed to ensure that they can successfully breed and rear cubs more regularly at the Lakes:

Summary key objectives:

- Identify past temporal and spatial patterns of otter activity and breeding / cub rearing at the lakes and surrounding area;
- Identify present patterns of otter activity and breeding / cub rearing at the lakes and surrounding area;
- Identify factors / problems likely to affect otter breeding and general use of the site;
- Identify problems & threats to otter breeding at the lakes;
- Identify actions needed to reduce / remove threats to otter breeding;
- Secure agreement with partner organisations on conservation actions to be undertaken to promote otter breeding at the lakes;
- Identify factors that might be affecting normal otter dispersal or commuting patterns between the lakes and other connecting habitat within the lakes catchment, and possibly beyond (within the otters normal range away from the lakes).

Access and recreational pressures: Access and recreation pressures are fairly well regulated by on site wardening and information, so otters should be reasonably well protected. However, changes in access and recreation trends, such as increases in visitor numbers, or new developments, could potentially impact otters in some way, such as altering the viability of the population in some areas. Due to the high conservation value of Bosherton Lakes there should be a strong presumption in favour of maintaining a closed fishing season (currently still being managed from mid March to mid June). Fishing points should be maintained regularly to prevent fishing debris becoming entangled in lake-side vegetation and posing a potential threat to otters. It will be essential to maintain links with partner organisations, (e.g. Pembrokeshire Outdoor Charter Group, Pembrokeshire Coastal Forum) to monitor visitor pressure and ensure that adequate steps are in place to regulate and protect otters. Close contact with the local community is also important to encourage interest in the site and to explain management issues that have to be tackled.

6. ACTION PLAN: SUMMARY

This section takes the management requirements outlined in Section 5 a stage further, assessing the specific management actions required on each management unit. This information is a summary of that held in CCW's Actions Database for sites, and the database will be used by CCW and partner organisations to plan future work to meet the Wales Environment Strategy targets for sites.

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
1	000092	01a. Bosherton Lake open water - Central and Western Arms	<p>This unit is being managed under the terms of a Nature Reserve Agreement with the National Trust, and covered by a CMS management plan for the whole site and its features.</p> <p>Most of the key management issues arise from the catchment, outside lake ownership and management influence - i.e. from nutrient enriched silt from diffuse sources. Water abstraction in the catchment is currently unlicensed, and so its potential impacts (although assumed to be minimal at present) cannot easily be measured. Though the Environment Agency CAMS review has agreed that there is an assumption against further abstraction if/when the process becomes licensable. Natural processes are also causing the shallow man-made lake to slowly infill.</p> <p>The key issues are: Natural water loss through limestone fissures - leading to very low summer and autumn water levels and likely future ingress of sea water as sea levels gradually rise.</p> <p>This may be exacerbated by unlicensed water abstractions in the catchment (CAMS) unit GWMU1). Site-based hydrological, geomorphological and climate change research is being undertaken. There should be a presumption of no further water abstraction from the catchment.</p> <p>Weirs should be maintained and a bypass pipe installed in the Central Lake by CCW in 1991, should be removed if possible as this may be contributing to lower lake levels.</p> <p>Natural sedimentation is occurring through decay of lake macrophyte vegetation. Regular late summer weed-harvesting reduces the volume of decaying vegetation.</p> <p>A cyclic programme of silt/sediment excavation management is needed in tandem with management of a series of silt-traps on the eastern arm inflow streams.</p>	Yes
2	000098	01b. Bosherton Lake open water - Eastern Arm	<p>This unit is being managed under the terms of a Nature Reserve Agreement with the National Trust, and covered by a CMS management plan for the whole site and its features.</p> <p>Most of the key management issues arise from the</p>	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
			<p>catchment, outside lake ownership and management influence - i.e. from nutrient enriched silt from diffuse sources. Water abstraction in the catchment is currently unlicensed, and so its potential impacts (although assumed to be minimal at present) cannot easily be measured. Though the Environment Agency CAMS review has agreed that there is an assumption against further abstraction if/when the process becomes licensable. Natural processes are also causing the shallow man-made lake to slowly infill.</p> <p>Phosphate and Nitrate levels exceed targets. There is little flushing of water so natural decay of lake macrophyte and other vegetation will contribute to nutrient/sedimentation enrichment cycles. Regular late summer weed-harvesting reduces the volume of decaying vegetation. A cyclic programme of silt/sediment excavation management is needed in tandem with management of a series of silt-traps on the eastern arm inflow streams.</p>	
3	000101	01c. Lakeside swamp and woodlands	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a Nature Reserve Agreement with the National Trust, and covered by a CMS management plan for the whole site and its features.</p> <p>Key issues to be addressed by the management plan or further amendments to this plan, include:</p> <p>Otter: Availability of suitable lying up sites for otters: It is important to continue to maintain key areas of undisturbed habitat cover (swamp, woodland and scrub) for feeding/resting otters and to determine if there are important areas in the valley being used by breeding otters that are currently unknown or under-recorded.</p> <p>Otter: Access and recreational pressures: Access and recreation pressures are fairly well regulated by on site wardening and information, so otters should be reasonably well protected. However, changes in access and recreation trends, such as increases in visitor numbers, or new developments, could potentially impact otters in some way, such as altering the viability of the population in some areas.</p> <p>It will be essential to maintain links with other partner organisations, (e.g. Pembrokeshire Outdoor Charter Group, Pembrokeshire Coastal Forum) to monitor visitor pressure and ensure that adequate steps are in place to regulate and protect otters. Close contact with the local community is also important to encourage interest in the site and to explain management issues that have to be tackled.</p> <p>Greater and lesser horseshoe bats: Availability of bat fly-ways and feeding areas:</p>	No

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
			<p>The bats require sheltered unlit cover as they leave the roosts to feed at night. Areas of areas of grassland and woodland nearby are important feeding grounds for the bats. This diversity of habitats should be maintained so as to provide a wide variety of invertebrates including large beetles and large moths etc upon which the bats feed. Maintain existing sheltered woodland and broad access track on the valley bottom. Manage scrub to maintain open insect-rich grassland and heath.</p> <p>Elvers and probably eels are being taken (possibly annually/regularly) at the lake outlet by a licenced fisherman, but without landowners (NT) consent and also infringing NT byelaws. There is a need to ensure that this activity is controlled and if possible stopped. Links with Environment Agency fishery officers to be maintained to review and amend licence/consents option.</p>	
4	000103	01d. Mere Pool Valley swamp and woodland	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a Nature Reserve Agreement with the National Trust, and covered by a CMS management plan for the whole site and its features.</p> <p>Key issues to be addressed by the management plan or further amendments to this plan, include:</p> <p>Otter: Availability of suitable lying up sites for otters: It is important to continue to maintain key areas of undisturbed habitat cover (swamp, woodland and scrub) for feeding/resting otters and to determine if there are important areas in the valley being used by breeding otters that are currently unknown or under-recorded.</p> <p>Otter: Access and recreational pressures: Access and recreation pressures are fairly well regulated by on site wardening and information, so otters should be reasonably well protected. However, changes in access and recreation trends, such as increases in visitor numbers, or new developments, could potentially impact otters in some way, such as altering the viability of the population in some areas.</p> <p>It will be essential to maintain links with other partner organisations, (e.g. Pembrokeshire Outdoor Charter Group, Pembrokeshire Coastal Forum) to monitor visitor pressure and ensure that adequate steps are in place to regulate and protect otters. Close contact with the local community is also important to encourage interest in the site and to explain management issues that have to be tackled.</p> <p>Greater and lesser horseshoe bats: Availability of bat fly-ways and feeding areas: The bats require sheltered unlit cover as they leave the roosts to feed at night. Areas of areas of grassland and woodland nearby are important feeding grounds for the</p>	No

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
			<p>bats. This diversity of habitats should be maintained so as to provide a wide variety of invertebrates including large beetles and large moths etc upon which the bats feed. Maintain existing sheltered woodland and broad access track on the valley bottom. Manage scrub to maintain open insect-rich grassland and heath.</p> <p>Ephemeral pools supporting smaller Charophyte species will need cyclic management to control succession and to maintain a balance between open water and swamp/scrub invasion to maintain Charophyte and other SSSI feature intersts.</p>	
5	000106	02a. Courtyard Flats lofts (GHB and LHB maternity roosts)	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a management agreement with the National Trust.</p> <p>Key issues to be addressed by the management agreement or further amendments to this agreement, include:</p> <p>Roost maintenance and repair works: There should be no modification to the roosts, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW.</p> <p>Roof-supporting timbers and roof covering fabric need to be checked regularly to ensure that the roof is not deteriorating and altering the roost microclimate and affecting its ability to provide suitable roosting conditions for the bats.</p> <p>Roost disturbance from lighting or noise: Disturbance to the bats can be caused by extra lighting around the roost access points and by human noise. This may have an effect on the numbers of bats emerging at dusk. CCW should liase with the roost owners over any possible changes that may affect bat access.</p>	No
6	000109	02b. Walled Garden cellars & tunnels (winter/transitory roost)	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a management agreement with the National Trust.</p> <p>Key issues to be addressed by the management agreement or further amendments to this agreement, include:</p> <p>Roost maintenance and repair works: There should be no modification to the roosts, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW.</p> <p>The underground structures need to be regularly checked to ensure that they are safe and continue to provide</p>	No

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
			adequate roosting sites for the bats.	
7	000111	03a. Slebech lofts (GHB maternity roost)	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a management agreement with the Slebech Park estate.</p> <p>Key issues to be addressed by the management agreement or further amendments to this agreement, include:</p> <p>Roost maintenance and repair works: There should be no modification to the roosts, exposure to fumes or harmful / irritant chemicals, disturbance (by people or animals) or excessive noise, without prior consultation with CCW.</p> <p>Roof-supporting timbers and roof covering fabric need to be checked regularly to ensure that the roof is not deteriorating and altering the roost micro-climate and affecting its ability to provide suitable roosting conditions for the bats.</p> <p>Roost disturbance from lighting or noise: Disturbance to the bats can be caused by extra lighting around the roost access points and by human noise. This may have an effect on the numbers of bats emerging at dusk. CCW should liaise with the roost owners over any possible changes that may affect bat access.</p>	No
8	000112	03b. Slebech cellars & tunnels (winter/transitory roosts)	<p>This unit is believed to be in appropriate management.</p> <p>This unit is being managed under the terms of a management agreement .</p> <p>Key issues to be addressed by the management agreement or further amendments to this agreement, include:</p> <p>The underground tunnel structures need to be regularly checked to ensure that they are safe and continue to provide adequate roosting sites for the bats.</p>	No
9	000113	04. Felin Llwyngwair - Mill building (GHB maternity & winter roost)	A management agreement is in place which has already contributed towards re-roofing work, so the building is in good condition at present.	No
10	002376	05. Carew Castle	The site is well-used by the public but it is not thought that there are any significant conflicts arising from this. The lesser hall has a problem with pigeons, and it is likely that these will have to be excluded. This will inevitably exclude bats too, so mitigation will be provided for the one chimney bat roost lost.	No
11	002377	06. Beech Cottage	The building is in favourable condition and has recently been equipped with automated bat counting equipment.	No
12	002378	07. Orielton Stable Block and	The owners have recently entered a management agreement with CCW to contribute towards works in the	No

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
		Cellars	roof. The roof is now in a favourable condition.	
13	002379	08. Park House Outbuildings	This building will require some works in the future, to prevent deterioration eg by water ingress. It is not thought that any work is needed urgently.	No

7. GLOSSARY

This glossary defines some of the terms used in this **Core Management Plan**. Some of the definitions are based on definitions contained in other documents, including legislation and other publications of CCW and the UK nature conservation agencies. None of these definitions is legally definitive.

Action	A recognisable and individually described act, undertaking or project of any kind, specified in section 6 of a Core Management Plan or Management Plan , as being required for the conservation management of a site.
Attribute	A quantifiable and monitorable characteristic of a feature that, in combination with other such attributes, describes its condition .
Common Standards Monitoring	A set of principles developed jointly by the UK conservation agencies to help ensure a consistent approach to monitoring and reporting on the features of sites designated for nature conservation, supported by guidance on identification of attributes and monitoring methodologies.
Condition	A description of the state of a feature in terms of qualities or attributes that are relevant in a nature conservation context. For example the condition of a habitat usually includes its extent and species composition and might also include aspects of its ecological functioning, spatial distribution and so on. The condition of a species population usually includes its total size and might also include its age structure, productivity, relationship to other populations and spatial distribution. Aspects of the habitat(s) on which a species population depends may also be considered as attributes of its condition.
Condition assessment	The process of characterising the condition of a feature with particular reference to whether the aspirations for its condition, as expressed in its conservation objective , are being met.
Condition categories	The condition of feature can be categorised, following condition assessment as one of the following ² : Favourable: maintained; Favourable: recovered; Favourable: un-classified Unfavourable: recovering; Unfavourable: no change; Unfavourable: declining; Unfavourable: un-classified Partially destroyed; Destroyed.
Conservation management	Acts or undertaking of all kinds, including but not necessarily limited to actions , taken with the aim of achieving the conservation objectives of a site. Conservation management includes the taking of statutory and non-statutory measures, it can include the acts of any

² See JNCC guidance on Common Standards Monitoring <http://www.jncc.gov.uk/page-2272>

party and it may take place outside site boundaries as well as within sites. Conservation management may also be embedded within other frameworks for land/sea management carried out for purposes other than achieving the conservation objectives.

Conservation objective The expression of the desired **conservation status** of a **feature**, expressed as a **vision for the feature** and a series of **performance indicators**. The conservation objective for a feature is thus a composite statement, and each feature has one conservation objective.

Conservation status A description of the state of a **feature** that comprises both its **condition** and the state of the **factors** affecting or likely to affect it. Conservation status is thus a characterisation of both the current state of a feature and its future prospects.

Conservation status assessment The process of characterising the **conservation status** of a **feature** with particular reference to whether the aspirations for it, as expressed in its **conservation objective**, are being met. The results of conservation status assessment can be summarised either as ‘favourable’ (i.e. conservation objectives are met) or unfavourable (i.e. conservation objectives are not met). However the value of conservation status assessment in terms of supporting decisions about **conservation management**, lies mainly in the details of the assessment of feature **condition**, **factors** and trend information derived from comparisons between current and previous conservation status assessments and condition assessments.

Core Management Plan A CCW document containing the conservation objectives for a site and a summary of other information contained in a full site **Management Plan**.

Factor Anything that has influenced, is influencing or may influence the **condition** of a **feature**. Factors can be natural processes, human activities or effects arising from natural process or human activities, They can be positive or negative in terms of their influence on features, and they can arise within a site or from outside the site. Physical, socio-economic or legal constraints on **conservation management** can also be considered as factors.

Favourable condition See **condition** and **condition assessment**

Favourable conservation status See **conservation status** and **conservation status assessment**.³

Feature The species population, habitat type or other entity for which a site is designated. The ecological or geological interest which justifies the designation of a site and which is the focus of conservation management.

Integrity See **site integrity**

Key Feature The habitat or species population within a **management unit** that is the primary focus of **conservation management** and **monitoring** in that unit.

³ A full definition of favourable conservation status is given in Section 4.

Management Plan	The full expression of a designated site's legal status, vision, features, conservation objectives, performance indicators and management requirements. A complete management plan may not reside in a single document, but may be contained in a number of documents (including in particular the Core Management Plan) and sets of electronically stored information.
Management Unit	An area within a site, defined according to one or more of a range of criteria, such as topography, location of features , tenure, patterns of land/sea use. The key characteristic of management units is to reflect the spatial scale at which conservation management and monitoring can be most effectively organised. They are used as the primary basis for differentiating priorities for conservation management and monitoring in different parts of a site, and for facilitating communication with those responsible for management of different parts of a site.
Monitoring	An intermittent (regular or irregular) series of observations in time, carried out to show the extent of compliance with a formulated standard or degree of deviation from an expected norm. In Common Standards Monitoring , the formulated standard is the quantified expression of favourable condition based on attributes .
Operational limits	The levels or values within which a factor is considered to be acceptable in terms of its influence on a feature . A factor may have both upper and lower operational limits, or only an upper limit or lower limit. For some factors an upper limit may be zero.
Performance indicators	The attributes and their associated specified limits , together with factors and their associated operational limits , which provide the standard against which information from monitoring and other sources is used to determine the degree to which the conservation objectives for a feature are being met. Performance indicators are part of, not the same as, conservation objectives. See also vision for the feature .
Plan or project	Project: Any form of construction work, installation, development or other intervention in the environment, the carrying out or continuance of which is subject to a decision by any public body or statutory undertaker. Plan: a document prepared or adopted by a public body or statutory undertaker, intended to influence decisions on the carrying out of projects . Decisions on plans and projects which affect Natura 2000 and Ramsar sites are subject to specific legal and policy procedures.
Site integrity	The coherence of a site's ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it is designated.
Site Management Statement (SMS)	The document containing CCW's views about the management of a site issued as part of the legal notification of an SSSI under section 28(4) of the Wildlife and Countryside Act 1981, as substituted.
Special Feature	See feature .

Specified limit	The levels or values for an attribute which define the degree to which the attribute can fluctuate without creating cause for concern about the condition of the feature . The range within the limits corresponds to favourable, the range outside the limits corresponds to unfavourable. Attributes may have lower specified limits, upper specified limits, or both.
Unit	See management unit .
Vision for the feature	The expression, within a conservation objective , of the aspirations for the feature concerned. See also performance indicators .
Vision Statement	The statement conveying an impression of the whole site in the state that is intended to be the product of its conservation management . A ‘pen portrait’ outlining the conditions that should prevail when all the conservation objectives are met. A description of the site as it would be when all the features are in favourable condition .

8. REFERENCES AND ANNEX

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ANNEX 1

Bosherston Lakes catchment area and CAMS Unit GWMU1

