

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

**CORE MANAGEMENT PLAN
(INCLUDING CONSERVATION OBJECTIVES)**

for

**Llangorse Lake/ Llyn Syfaddan Site of Special Scientific Interest
(SSSI)/ Special Area of Conservation (SAC)**

Date: 24 March 2008

Approved by: David Mitchell

**More detailed maps of management units can be provided on request.
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 site named. It sets out what needs to be achieved on the site, 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 site. This is required to implement the Conservation (Natural Habitats, &c.) Regulations 1994, as amended (Section 4).

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.

Llangorse Lake is an outstanding natural feature situated towards the head of the Afon Llynfi between the hills of Mynydd Llangorse and Allt yr Esgair. On average, the lake itself covers around 70% of the site and the water levels are allowed to change naturally with changes in rainfall patterns and season. During wetter periods, surrounding land is flooded, which maintains the rich array of habitats transitional between open water and drier ground. These habitats, which include reed beds, sedge fen, wet woodland and wet and dry grasslands, sit sympathetically at the edge of the lake, adding both shelter and diversity. In times of heavy rain the lake also acts as a temporary store for floodwater, slowly releasing it as rain subsides. Water quality is high, inputs of nitrates and other nutrients and sediments from agricultural and domestic sources are under control and the quality and clarity of the water is generally good. The fish population consists of native species such as pike, perch and eels, with populations of bottom-feeding species such as bream at levels that do not affect the aquatic flora. Non-native plant species or fish, such as grass-carp, are absent.

The growth of pondweeds is dependent on a variety of factors such as water temperature and turbidity and may vary each year, but in most years there is good growth, with pondweeds with both thin and wide leaves mixing with the delicate leaves of water-milfoils, hornworts and water-crowfoots. Closer still to the lake's edge the water surface is covered in the floating leaves and flowers of water lilies.

Large parts of the lake margin are fringed by dense beds of common reed and tall sedges and here and there are patches of lesser reedmace, bur-reeds and club-rush. Scattered amongst these beds are uncommon plants such as flowering rush, tubular water dropwort and meadow rue. In mid summer the striking flowers of purple loosestrife, bog bean and the sweet aroma of water mint add extra interest to the marginal vegetation. Wet woodland dominated by alder and willow and coloured by marsh marigold in the spring extends into the reed beds in many places and forms a bridge between the lake and the land. In a few areas there is damp oak and ash woodland with magnificent veteran trees on the drier fringes of the lake. In other places, marshy grasslands display an array of colourful flowers such as ragged-robin, marsh bedstraw, meadowsweet, greater birds-foot trefoil and orchids. Further up the slopes the land slowly dries and drier neutral grassland becomes the dominant habitat, with common knapweed, bird's-foot trefoil and red clover adding a further dash of colour to the landscape.

In the summer, reed and sedge warbler and sometimes Cetti's warbler can be heard singing from the tall marginal vegetation, while hobbies hunt dragonflies and damselflies above. Several pairs of great crested grebes nest amongst the reed beds and on the quieter margins of the lake, waders such as lapwing and curlew display and breed. Towards mid-summer large numbers of mute swans arrive to moult. Insects and other invertebrates abound, and the quiet observer may catch a glimpse of the rare two-tone reed beetle before it drops from the vegetation in an attempt to escape predation. In winter, large rafts of wildfowl such as pochard, tufted duck, goldeneye and coot can be seen drifting on the lake, with more rarely the occasional smew, and the pig-like squeals of the secretive water rail may sometimes be heard in the reed beds. During spring, late summer and autumn, migrating birds including terns and waders, and rarities such as the aquatic warbler, stop over to rest and feed. Large numbers of swallows roost in the reed beds.

2. SITE DESCRIPTION

2.1 Area and Designations Covered by this Plan

Grid reference: SO 133 265

Unitary authority: Powys

Area (hectares): 214.5

Designations covered: The SAC is underpinned by Llyn Syfaddan (Llangorse Lake) Site of Special Scientific Interest (SSSI). The SSSI is notified for its aquatic and terrestrial habitats, together with important population of vascular plant species and assemblage and important invertebrate populations.

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

Llangorse Lake is a large shallow lake with a mean depth 2-3 metres lying in a natural depression of the Old Red Sandstone drift formed during the last glacial period. It is the largest natural lowland water in south Wales. It is one of the few natural eutrophic lakes in Britain and is of European importance in this context.

The combination of the mineral-rich geology and size and shape of the lake encourages the growth of a wide range of aquatic and marginal plants, including several that are rare in this part of Wales. The site also demonstrates a gradation from open water, with submerged and floating plant beds, through marginal swamp and fen vegetation, marshy grassland to drier unimproved grassland, with patches of willow scrub and wet woodland. The lake also has a diverse plankton community and supports a wide variety of invertebrates, including rare and scarce species.

2.3 Outline of Past and Current Management

The presence of a man-made island or "crannog" is evidence that the lake area was settled in prehistoric times. It is likely that the lake provided a valuable source of fish for these crannog dwellers and coarse angling is still enjoyed here.

The lake itself is common land, although most of the surrounding land is outside the common. This is a very popular location for water-based recreation and as such it helps support the local economy. The outstanding natural setting of the lake and large size means that it is used by fishermen, sailing craft, water-skiers, canoeists, kayakers and outdoor groups. There were problems in the past with pollution from sewage effluent, and this has been compounded by nutrient and sediment run-off from farming activities in the lake catchment. There are still some problems with run-off and the lake sediments have a very high nutrient content, particularly phosphate, which causes problems when the sediment is disturbed by boats and bottom feeding fish.

An area of common land on the north shore has been developed as a boat launching area, with associated facilities. A zoning arrangement has been put in place in an attempt to limit

disturbance to waterfowl and to vegetation. Most of the surrounding fields and some of the lake margins are grazed. Grazing varies in intensity and there has been some poaching damage in places. Small areas are cut for hay.

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 tenure, but also with reference to features and land management requirements.

A map which shows the management units accompanies this plan.

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

Unit number	SAC	SSSI
Llyn Syfaddan/Llangorse Lake SSSI		
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓

3. THE SPECIAL FEATURES

3.1 Confirmation of Special Features

<i>Designated feature</i>	<i>Relationships, nomenclature etc</i>	<i>Conservation Objective in part 4</i>
<i>SAC features</i>		
<i>Annex I habitats that are a primary reason for selection of this site:</i> 1. Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation.	EU Habitat Code 3150. The SAC feature is mainly synonymous with the SSSI feature Eutrophic Standing Water: Group 1 (Type 10A). The SAC interest is taken to be the body of water at winter levels and thus includes much of the marginal vegetation and therefore overlaps with Feature 2 below.	1
<i>SPA features</i>		
Not applicable		
<i>Ramsar features</i>		
Not applicable		
<i>SSSI features</i>		
2. Swamp, marginal & inundation Vegetation (with associated willow scrub, wet woodland, marshy, and unimproved neutral grassland).	A wide variety, including vegetation conforming to National Vegetation Classification types S4, S8, S11, S12, S14, S19, S20, S22, S28, MG11, MG13, OV28 & OV30.	1 (covers part of this feature)
3. Round-fruited rush <i>Juncus compressus</i> .	Regionally rare, edge of UK range.	
4. Tubular water-dropwort <i>Oenanthe fistulosa</i> .	Regionally rare.	
5. Shining pondweed <i>Potamogeton lucens</i> .	Regionally rare, edge of UK range.	
6. Perfoliate pondweed <i>Potamogeton perfoliatus</i> .	Regionally rare.	
7. Golden dock <i>Rumex maritimus</i> .	Regionally rare, edge of UK range.	
8. Two-tone reed-beetle <i>Donacia bicolora</i> .	Rare and vulnerable in UK.	
9. Variable damselfly <i>Coenagrion pulchellum</i> .	Regionally rare, scarce in UK.	

The SSSI species features at Llangorse Lake are provisional. Some additional plant species may be individually qualifying.

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 driver of management and focus of monitoring effort, perhaps because of the dependence of a key species (see KS below). There will usually only be one Key Habitat in a unit but there can be more, especially with large units.

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 driver of management and focus of 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 drivers of management or focus of 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 may be 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), e.g. a mobile species that uses large parts of the site and surrounding areas.

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 that are essential for the management of features elsewhere on a site e.g. livestock over-wintering area included within designation boundaries, buffer zones around water bodies, etc.

x – Features not known to be present in the management unit.

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

Llyn Syfaddan	Management units												
	1	2	3	4	5	6	7	8	9	10	11	12	13
SAC features:													
1. Naturally nutrient-rich lakes or lochs, which are often dominated by pondweed	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH
SSSI features:													
2. Swamp, marginal & inundation vegetation	KH	KH	KH	KH	KH	KH	KH	KH	Sym	KH	KH	KH	KH
3. Round-fruited rush	Sym	?	?	?	?	?	?	?	?	?	Sym	?	
4. Tubular water-dropwort	Sym	Sym	?	?	?	?	?	?	?	?	?	Sym	
5. Shining	x	x	x	x	x	x	x	x	x	x	x	x	KS

pondweed													
6. Perfoliate pondweed	x	x	x	x	x	x	x	x	x	x	x	x	KS
7. Golden dock	Sym	Sym	Sym	?	?	?	Sym	?	?	?	Sym	?	
8. Red beetle <i>Donacia bicolora</i>	KS	?	?	?	?	?	?	KS	?	?	KS	KS	?
9. Variable damselfly	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	KS

Some units contain quite large areas of semi-improved grassland. These areas have been included to provide a buffer against sediment run-off and nutrient enrichment.

Unit 1 is owned or leased by the BBNPA.

Unit 9 is the crannog - a man-made island and a Scheduled Ancient Monument (SAM). The island supports a few trees and there is a little marginal aquatic vegetation, but the main interest is archaeological. The boundary of the SAM extends beyond the island to include part of the water body and aquatic vegetation.

Unit 11 is common land, which has been developed in connection with recreational use. This is where the main jetties for launching boats are situated. There are also buildings, car parks, tracks and amenity grassland.

Unit 13 is the main body of water, which is a common in its own right. The size of the water body fluctuates and the lake is generally more extensive in the wetter winter months. The lake margin as illustrated on the accompanying map shows the boundary of Unit 13, and represents mean summer level.

In Units 1-8 & 10-12, which are mainly small fields, the SAC habitat is largely confined to the inundation zones (consisting of marginal fen and related habitats) which are flooded during the winter months and during high rainfall periods in summer months. Most of these units also contain habitats including marshy grassland, neutral grassland and woodland, which are not submerged by winter water levels.

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 Directive 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 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 which 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:

Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation (EU Habitat Code 3150)

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:

- There is no loss of lake area, as defined in 2006 aerial photographs for summer levels.
- The aquatic plant community is typical of this lake type in terms of composition and structure, including species such as water-starworts, stoneworts, duckweeds, broad-leaved and fine-leaved pondweeds, water lilies, amphibious bistort, water-crowfoots, rigid hornwort, spiked water-milfoil, mare’s-tail and horned pondweed.
- Plants indicating very high nutrient levels and excessive silt loads are not dominant and invasive non-native water plants do not threaten to out-compete the native flora.
- The nutrient, pH and dissolved oxygen levels are typical for a lake of this type and there is no excessive growth of cyanobacteria or green algae.
- There is a natural hydrological regime.
- The natural shoreline is maintained.
- The natural and characteristic substrate is maintained.
- The natural sediment load maintained.
- 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. See Common Standards Monitoring for further detail with regards attributes, factors, limits and monitoring criteria.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A.1 Extent & Distribution	The natural extent of open water (including beds of floating plants) in the summer is around 120 ha. Lower limit set to maintain sufficient open water whilst allowing the further development of beds of tall emergent vegetation in unit 13 (see also 4.2).	<i>Upper limit</i> : N/A <i>Lower limits</i> : 115 ha of open water. AND the majority of unit 13 should be open water.
A.2 Aquatic plant community composition	The range of plants present should reflect that which is to be expected in a in a lowland lake that is not excessively nutrient-rich. Algae that indicate excessive nutrient levels should not be dominant. 90% of the lake should comply with limits set for algae. Targets for characteristic plants should be met over 60% of the lake.	<i>Upper limits</i> : Benthic and filamentous algae no more than frequent (for example over 3 transects, filamentous algae should only be present at a DAFOR score of 2 or 3 (on scale 0-3) in less than 10% of sampling points) AND there should be no blooms of blue-green or planktonic green algae. <i>Lower Limits</i> : At least 6 characteristic plants (see

		table below) present AND all <u>associated</u> plants listed in table below should continue to be present within the lake.
A.3 Plant community structure	Characteristic vegetation zones, including submerged and floating plant beds, tall emergent vegetation and transitions to damp terrestrial habitats, should be present.	<i>Upper limits:</i> N/A <i>Lower limits:</i> Submerged plant beds present to a depth of at least 2m AND floating-leaved plant beds (but not including <i>Nymphoides peltata</i> which is introduced) present around the lake, covering at least 6 ha of the lake surface in total AND: a zone of tall emergent vegetation, including sedge and reed swamp, around most of the lake margins.
A.4 Non-native invasive species	Non-native invasive species compete aggressively with native plants and animals and cause major changes to the ecosystem. They may cause native species to become extinct. Many are very difficult to control or eradicate, once established. 50% of the lake should comply with the limits set for non-native waterweeds (<i>Elodea</i> spp.)	<i>Upper limits:</i> Canadian and/or Nuttall's waterweed (<i>Elodea</i> spp.) no more than frequent. AND: No invasive non-native species, such as New Zealand pigmyweed, floating pennywort, curly waterweed, parrot's-feather, water fern, signal crayfish and zebra mussel, are present in the lake. <i>Lower limit:</i> None
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F.1 Water quality	The water quality should be appropriate to support the ecosystem. In particular, there should be no eutrophication (nutrient enrichment). Sources of nutrients are mainly from diffuse sources in the catchment, in particular agriculture and septic tanks. A nutrient budget for the catchment has recently been produced. Water chemistry should be sampled at a series of locations and depths throughout the year (at least quarterly) to obtain average figures.	<i>Upper limit:</i> Annual mean total phosphorus (TP) of 35 µg l ⁻¹ or less. <i>Lower limit:</i> At least 5 mg l ⁻¹ dissolved oxygen (O ₂) throughout the water column.
F.2 Hydrology	The supply of water entering and leaving the lake should follow a natural seasonal cycle. This is necessary for the life cycle of many of the animals and plants that live in the lake.	<i>Upper limits:</i> No new structures that will reduce inflow or deepening or enlargement of outflow points. <i>Lower limit:</i> N/A

<p>F.3 Sediment loads and lake substrate</p>	<p>Unnaturally high silt loads in run-off entering the lake can affect plant growth by reducing light levels and causing nutrient enrichment. This also leads to an accumulation of nutrient rich sediment on the lakebed, which causes further problems when it is disturbed. Long-term impacts are related to the gradual infilling of the lake with the consequent loss of available habitat.</p>	<p><i>Upper Limits:</i> No extensive poaching of the lake margins by stock.</p> <p><i>Lower limit:</i> N/A</p> <p>NB. Additional limits could be set for silt load in the water column and/or sediment accumulation rates on the lakebed and nutrient content.</p>
<p>F.4 Recreational disturbance</p>	<p>These can have a variety of effects, but the main cause of concern is the potential for these activities to disturb sediment and reduce water clarity, particularly during the spring and early summer (see above).</p>	<p><i>Upper limits:</i> No use outside agreed zones and periods of year as described in printed guidance.</p> <p><i>Lower limit:</i> N/A</p>
<p>F.5 Development</p>	<p>Development of structures on the lakeshore damages the natural vegetation zonation. Jetties, slipways and hard bank structures should be confined to unit 11. Baseline set using 2006 aerial photography.</p>	<p><i>Upper limit:</i> No new permanent jetties, slipways or hard bank structures.</p> <p><i>Lower limit:</i> N/A</p>
<p>F.6 Fishery</p>	<p>Bream appear to have been introduced to the lake in the recent past, with large numbers present during period when nutrient/polluted water entering the lake was at its highest. Species such as bream, which tend to feed on the bottom of the lake, have the potential to disturb sediments and affect the water chemistry and turbidity. Species such as common carp, which do not appear to be present in the lake, would compound sediment disturbance and would be undesirable in the lake. Grass carp, which feed on aquatic plants, have been introduced to some water bodies in Britain and are freely sold in garden aquatic centres. Any introduction of species that are not native to Llangorse would be highly undesirable.</p>	<p><i>Upper limit:</i> Introduced species should be removed or populations controlled as necessary. This will be guided by regular EA fish sampling.</p> <p><i>Lower limit:</i> Fish are an essential component of the lake ecology. Populations need to be maintained by a sensible fisheries policy/rules and by ensuring other factors such as water quality are under control.</p>

Characteristic Water Plants:

Water-starworts (*Callitriche* spp.); stoneworts (*Chara* spp.); curled pondweed (*P. crispus*); shining pondweed (*P. lucens*); various-leaved pondweed (*P. gramineus* - not seen for many years but would indicate improvement in lake quality); long-stalked pondweed (*P. praelongus* - not seen for many years but would indicate improvement in lake quality); perfoliate pondweed (*P. perfoliatus*); lesser pondweed (*P. pusillus*); mare's-tail (*Hippuris vulgaris*); fan-leaved water-crowfoot (*Ranunculus circinatus*); greater duckweed (*Spirodela polyrhiza*).

Associated Water Plants:

Rigid hornwort (*Ceratophyllum demersum*); bog-bean (*Menyanthes trifoliata*); spiked water-milfoil (*Myriophyllum spicatum*); yellow water-lily (*Nuphar lutea*); white water-lily (*Nymphaea alba*); amphibious bistort (*Polygonum amphibium*); small pondweed (*Potamogeton berchtoldii*), broad-leaved pondweed (*Potamogeton natans*); fennel pondweed (*P. pectinatus*); three-leaved water-crowfoot (*Ranunculus trichophyllous*); duckweeds (*Spirodela* and *Lemna* spp.), horned pondweed (*Zanichellia palustris*).

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: Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation (EU Habitat Code 3150)

Conservation Status of Feature 1:

The conservation status of this feature within the site is considered to be **Unfavourable** (2006).

Feature condition was assessed in 2003/04 and found to be unfavourable, recovering. This assessment covered most of the performance indicators listed in 4.1. The target failures related to a high frequency of Nuttall's waterweed, high levels of total phosphorus (TP) and excessive stock poaching in places. The lake's water continues to fall short of the targets set for naturally eutrophic lakes, although considerable reductions in nutrient concentrations, particularly TP, have occurred over the last few decades. The lake is considered to be a risk of both diffuse and point source pollution according to the Environment Agency's Review of Consents and Water Framework Directive risk assessments, which is in agreement with the site condition assessment.

Management Requirements of Feature 1:

The full restoration of the lake to favourable condition may be difficult to achieve in the short term because of residual nutrients stored within the lake's sediments. However, every effort should be made to restore the structure and functioning of the lake to a favourable, sustainable status, with particular attention being paid to the management of environmental factors which could cause the lake to switch from the plant-dominated to phytoplankton-dominated stable state. The following management issues need to be specifically addressed:

Water Quality and sedimentation

The quality of the water at Llangorse Lake is very important to the maintenance of its very special plants and animals. The lake sits within a small, predominantly lowland catchment and so receives its water from a very limited area. As the small Afon Llynfi is the main outlet for water from the lake, the water flows through the lake very slowly and any pollutants entering the lake will potentially remain there for long periods. Much of the current pollution is in the form of nutrients from the air and the many small watercourses entering the lake. Extra nutrients in a naturally nutrient rich lake dramatically change the types of plants growing in the lake and the number and type of insects that are able to live among the plants. This has a knock-on effect on the fish, birds and mammals of the lake. Possible effects from increasing numbers of Canada geese at the site, which may move nutrients from surrounding land to the waterbody, need further investigation.

Since the diversion directly to the Afon Llynfi of water that was causing eutrophication of the lake, the lake has been slowly recovering from a polluted state and it is vital that this recovery continues. The lake is surrounded by land that is agriculturally productive, with much used as arable or grass ley. It is important that any application of fertilizer (including manure) within the SSSI or lake catchment should be compliant with good agricultural practice, and it is of equal importance to control other inputs from agricultural and domestic sources, so as to avoid excessive levels of nutrients entering watercourses and eventually the lake.

Llangorse Lake sits in a shallow natural basin; the average depth of the lake is only 2-3 metres. The natural processes of erosion from the surrounding hills will naturally reduce the depth of the lake, albeit at a very slow rate, over time, but because of the shallowness of the lake it is exceptionally vulnerable to any extra sediments that may enter the lake from sources other than the natural inputs. It is essential that land in the catchment be carefully managed to avoid sediment run-off, which could cause rapid siltation of the lake. It is therefore important that any land management practices such as ploughing and stock feeding within the SSSI or lake catchment should be compliant with good agricultural practice. Avoiding any exposed soil or mud where it can wash into watercourses entering the lake and keeping a buffer zone of permanent grassland in the lake's flood zone and next to water courses. Any ditches feeding into the lake need to be carefully managed to enable sediments to be trapped rather than enter the lake.

CCW will continue to work with partners including the local authority, landowners in the catchment of the lake and the Environment Agency and the Welsh Assembly Government to further the recovery of the lake's water quality.

Recreation

Llangorse Lake continues to be an understandably very popular location for water-based recreation and as such it helps support the local economy. The outstanding natural setting of the lake and large size means that it attracts fishermen, sailing craft, water-skiers, canoeists/kayakers and outdoor groups. However, there is great potential to disturb habitats and the wildlife that inhabits the lake. The many bird species that feed, nest or rest on and around the lake are particularly vulnerable to disturbance from recreational use of the lake itself and from walkers and dogs. Wash from motorboats can be a problem, as it can erode vegetation and the shoreline and it is essential that the numbers using the lake are limited and exclusion zones observed. Fishing should be managed to ensure that the balance of fish populations is maintained, predatory fish such as pike, are returned to the lake, and that there is no introduction of fish species not native to the lake.

Guidelines have been drawn up by Llangorse Lake Advisory Group to ensure that water users are aware of the wildlife of the lake and the potential to disturb it if activities are not undertaken in a responsible manner. These guidelines, which vary depending on the season, are freely available to all users and visitors.

Llangorse Lake is a very popular destination with walkers, picnickers and bird watchers. There are footpaths around much of the southern and western part of the lake, with car parks and picnic tables at Llangorse and Llangasty Tal-y-llyn. Together with the bird hide on the southern shores of the lake, this access offers great opportunities for people to enjoy the lake's natural beauty and wildlife. It is essential that this land-based recreation should continue to have a low impact on the lake's wildlife and that people continue to behave responsibly, do not disturb the habitats and importantly keep dogs under control to prevent disturbance to nesting birds. Parts of the lake have no public access and it is essential that this should continue, as it is in these quiet areas that birds such as lapwing are able to continue to breed, wildfowl such as coot and wigeon can feed, and mammals such as otters can find quiet areas to rest. With the correct management of recreational activities on and off the lake and if users are encouraged to behave in a responsible manner, the lake can continue to be enjoyed by all, without detrimental impact on the wildlife of the lake.

Habitat management

The many other habitats around the lake, such as the fen, woodlands and grassland are very important in their own right and often require management. The grasslands should be managed sympathetically, being either cut for hay in early summer and the aftermath grazed by sheep or cattle or lightly grazed throughout the growing season from spring into the early autumn. However, this would need to be carefully managed, so that the marginal vegetation is not damaged and marginal sediments not

disturbed by excessive trampling. It may be desirable in places to fence out margins to allow recovery. Much of the woodland surrounding the fringes of the lake adds greatly to the lake's diversity and provides further sheltering opportunities for its wildlife and requires little management. However, should the wet woodlands continue their expansion into the reed beds, non-chemical measures to control it should be employed to prevent losses of the other important habitats. The winter cutting of some reed beds could also be employed to aid the continuation of this fragile habitat and CCW will continue to monitor the situation and instigate management should it be needed.

Non-native invasive species

Non-native species including Canada geese and Canadian pondweed already exist in and around Llangorse Lake. Although all of the consequences of their presence (especially the impacts of grazing and enrichment from geese) are not desirable, their impact is not well understood at present and further research is required. Similarly, the presence of introduced fish species such as bream, which through feeding can disturb the lake sediments, raise the amount of available nutrients and cloud the water, which in turn can affect algal and aquatic weed vegetation. There are many non-native species such as New Zealand pigmyweed, zebra mussels and carp that, if introduced, could out-compete native species or in the case of carp cause severe disturbance to lake sediments. A potential source of introduction of some of these species could be via boats or other equipment, which is moved between sites, so it is vital that preventative measures, such as cleaning and drying are undertaken by watercraft users. Advisory notes on preventing the spread of some of these are available from bodies such as the Environment Agency.

CCW and the Environment Agency will continue to monitor for any evidence of invasive non-native species in the lake and will act swiftly remove them should they become problematic. The Llangorse Lake Advisory Group also has a strong role in educating all users of the lake in the correct measures to undertake before launching watercraft on the lake.

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	000292	Unit 1	Managed by the BBNPA	No
2	000293	Unit 2		No
3	000294	Unit 3		No
4	000295	Unit 4	Under a Tir Gofal agreement	No
5	000296	Unit 5		No
6	000297	Unit 6	Under a Tir Gofal agreement	No
7	000298	Unit 7		No
8	000299	Unit 8		No
9	000300	Unit 9		No
10	000301	Unit 10		No
11	000302	Unit 11		No
12	000303	Unit 12	In a TG agreement	No
13	000304	Unit 13	The core of the water body which is influenced by inputs such as sedimentation and eutrophication via the streams that feed the lake and also possibly run-off from surrounding fields	Yes

7. GLOSSARY

This glossary defines the 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 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

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

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.
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

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

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

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