

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

**CYNLLUN RHEOLI CRAIDD
YN CYNWYS AMCANION CADWRAETH**

AR GYFER

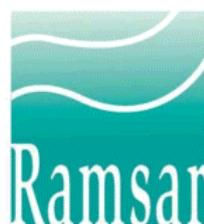
Migneint-Arenig-Dduallt ACA/AGA

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Dyddiad: Ebrill 15 2008

Wedi'i gymeradwyo gan: NR Thomas

Dyma grynodedb o ddogfen dechnegol. Mae croeso i chi ofyn am fersiwn Cymraeg.



CYNNWYS

Rhagair: Pwrpas y ddogfen hon

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RHAGAIR

Mae'r ddogfen hon yn cynnwys prif elfennau cynllun rheoli Cyngor Cefn Gwlad Cymru ar gyfer y safleoedd a enwir. Mae'n nodi'r hyn sydd angen ei gyflawni ar y safleoedd, canlyniadau monitro, a chynghor ynglŷn â'r gweithredu angenrheidiol. Mae'r ddogfen hon ar gael drwy wefan y Cyngor Cefn Gwlad a gall y bydd yn cael ei hadolygu os yw amgylchiadau'n newid neu os daw gwybodaeth newydd i'r amlwg. Dogfen dechnegol yw hi, sy'n cyd-fynd â gwybodaeth gryno ar y wefan.

Un o swyddogaethau allweddol y ddogfen hon yw darparu datganiad y Cyngor o'r Amcanion Cadwraeth ar gyfer y safleoedd Natura 2000 perthnasol. Mae hyn yn ofynnol er mwyn gweithredu'r Rheoliadau Cadwraeth (Cynefinoedd Naturiol, &c.) 1994 fel y'u diwygiwyd (Adran 4). Yn unol â Pholisi Llywodraeth Cynulliad Cymru, mae darpariaethau'r rheoliadau hyn i'w gweithredu hefyd mewn perthynas â Safleoedd Ramsar yng Nghymru.

1. Y WELEDIGAETH AR GYFER Y SAFLE

Mae hwn yn drosolwg disgrifiadol o'r hyn y mae angen ei gyflawni er mwyn cadwraeth ar y safle. Mae'n dod â'r Amcanion Cadwraeth (rhan 4) ynghyd ac yn eu crynhoi mewn un datganiad integredig am y safle.

Y weledigaeth ar gyfer yr ACA

Ein gweledigaeth ar gyfer ACA Migneint-Arenig-Dduallt yw cynnal, neu le bo angen adfer, cynefinoedd nodweddiadol ACA y safle ucheldirol hwn sy'n cynnwys gorgors, rhostir sych, rhostir gwlyb, coetir a llynnoedd, i gyflwr da fel y gall ei holl rywogaethau nodweddiadol ac anghyffredin gynnal eu hunain yn y tymor hir fel rhan o ecosystem sy'n gweithredu'n naturiol. Ein gweledigaeth hefyd yw cynnal a rheoli adferiad nodweddiadol adar yr AGA, sef y boda tinwyn, y cudyll bach a'r hebog tramor, fel y bydd eu poblogaethau'n gynaliadwy ac yn hyfyw yn y tymor hir. Mae rheoli nodweddiadol yr AGA yn hanfodol gysylltiedig â rheoli'r cynefin sy'n eu cynnal.

Gorgors (sy'n cynnwys pyllau cors a gorgors siglennaidd o'r cymunedau Dosbarthiad Cenedlaethol Llystyfiant (NVC) canlynol: - M1, M2, M3, 17, 18, 19 a 20), sy'n gorchuddio llawer o'r ACA (tua 8100 ha) ar hyn o bryd ond mae cyfran sylweddol o'r cynefin hwn, rhyw ddau draean, yn anffafriol ar hyn o bryd. Ein gweledigaeth yw cadw'r orgors mewn cyflwr ffafriol a'i hadfer i gyflwr ffafriol lle mae yna haen rugaidd dros y plu'r gweunydd unben, mwsogl y gors yn fynych a rhywogaethau nodweddiadol ac anghyffredin o blanhigion. Dylid ail ail-adfer strwythur mwy naturiol lle mae ffosydd draenio'n cael eu llenwi'n llwyr neu'n rhannol i ffurfio pyllau cors ac mae'r gors heb unrhyw goed gan gynnwys conwydd.

Dylid cynnal ac adfer y **rhostir sych** sy'n gorchuddio tua 2600 ha ar hyn o bryd (sy'n cynnwys cymunedau NVC: H8, 9, 10, 12, 18 a 21) fel y bydd yr arwynebedd yn ehangu ar draul darnau addas o laswelltir. Mae arwynebedd y rhostir mynyddig a geir ar Arenig Fach wedi'i gyfyngu i raddau helaeth gan uchder, pa mor agored ydyw i'r tywydd a ffactorau hinsoddol eraill, ond mae hefyd yn agored iawn i ddifrod gan bori a llosgi. Efallai y bydd rhywfaint o botensial cyfyngedig i'r cynefin hwn gynyddu (e.e. ar Arenig Fawr) a chaiff hyn ei hybu lle bo'n briodol.

Mae gan y **rhostir gwlyb** (sy'n cynnwys cymuned NVC M15) ac sy'n gorchuddio tua 400ha, ddosbarthiad clytiog ac yn ddiau mae'n cynnwys rhywfaint o orgors sydd wedi dirywio ar briddoedd mawn dyfnach. Ein gweledigaeth yw adfer a chynnal y cynefin hwn gan gynnwys ehangu ei arwynebedd ar draul y mathau gwlypach o laswelltir asidig a chynefin sydd wedi dirywio. Efallai y caiff rhai darnau o rhostir gwlyb eu hadfer yn orgors.

Yma, mae nodweddiadol **coetir** yr ACA, "hen goedydd derw digoes gydag *Ilex* a *Blechnum* yn Ynysoedd Prydain" yn ucheldirol ei natur a dylai fod yma ryngbarthau naturiol i weundir. Mae yna goedlannau penodol (Coed Dôl Fudr, Coed Gordderw, Coed Maen y Menyn a Choed Boch-y-Rhaeadr) yn yr ACA yn ogystal â chlystyrau gwasgaredig. Fel arfer mae gan y coetir gyfran fawr o fedw llwyd a cherddin. Dylai'r fflora bryoffyttau toreithiog mewn mannau, sy'n cynnwys rhywogaethau cefnforol ac Atlantig, barhau i ffynnu. Byddai rhywfaint o ehangu'r coetir llydanddail (tua 80 ha ar hyn o bryd) a phrysgwydd yn ddymunol lle bo'n briodol, o gwmpas ymyl y gweundir, ar yr amod bod hyn fel arfer ar draul glaswelltir asidig prin o rywogaethau neu redyn cyffredin.

Rydym yn disgwyl i arwynebedd y **llynnoedd** "dŵr clir (oligotroffig)" a "mawnaidd (dystroffig)" aros yn sefydlog. Bydd rheolaeth gynaliadwy ar eu dalgylchoedd yn sicrhau y cânt eu cadw mewn cyflwr ffafriol neu eu hadfer i gyflwr ffafriol. Mae llygredd atmosfferig a newid yn yr hinsawdd sy'n effeithio ar y rhain a chynefinoedd eraill y tu allan i gylch gorchwyl y cynllun hwn. Mae CCGC yn cydweithio â Llywodraeth y DU a rhanddeiliaid eraill i geisio sicrhau yr eir i'r afael â'r problemau hyn.

Dylid cadw poblogaeth nythu'r **boda tinwyn**, y **cudyll bach** a'r **hebog tramor** ar lefelau sy'n

hyfyw yn y tymor hir. Byddwn yn anelu at gynyddu poblogaethau nythu a chynhyrchiant cyfartalog y rhywogaethau hyn os oes modd. Dylai fod digon o gynefin nythu, clwydo a hela ar gael i'r rhywogaethau AGA hyn, sydd efallai'n nythu ar ymylon y goedwigaeth neu ar greigiau cyfagos i ffin y safle.

Bydd yr holl ffactorau sy'n effeithio ar sicrhau cyflwr ffafriol o dan reolaeth. Mae presenoldeb ACA/AGA Migneint-Arenig-Dduallt a'i bywyd gwyllt arbennig yn gwella gwerth economaidd a chymdeithasol yr ardal, trwy ddarparu amgylchedd o ansawdd da er mwynhad tawel gan bobl leol ac ymwelwyr.

2. SITE DESCRIPTION

2.1 Area and Designations Covered by this Plan

Grid reference: SH 780 450

(This is the approximate central point of the SAC. As this is a large, composite site, this may not represent the location where a feature occurs within the SAC).

Unitary authority: Snowdonia National Park Authority

Area (hectares): 19,968.23

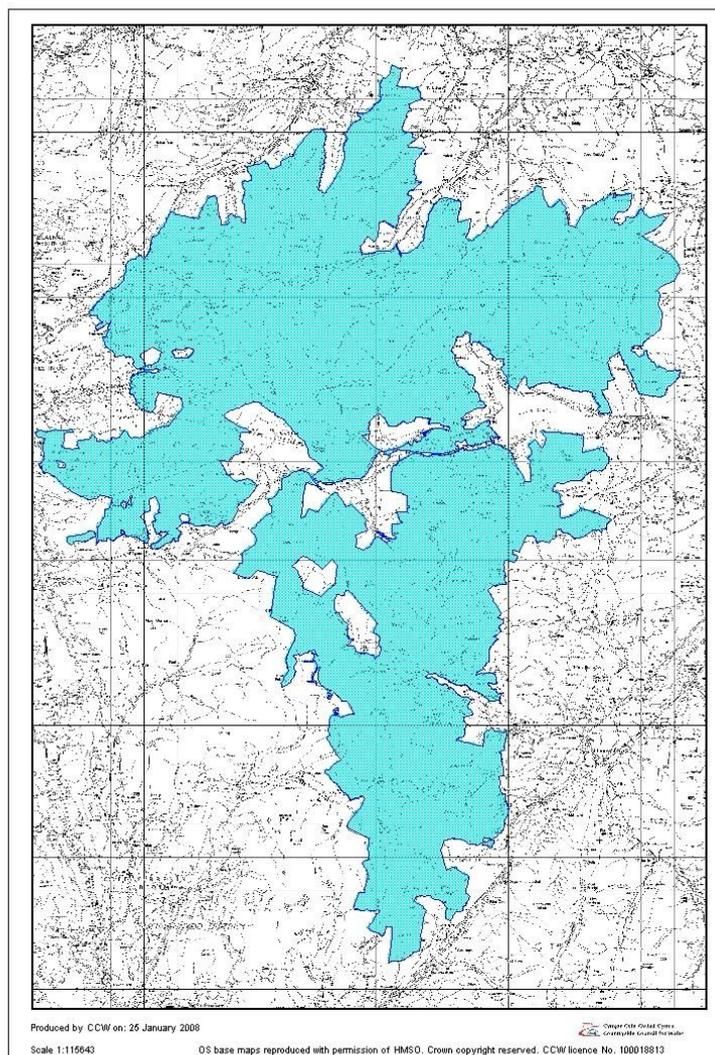
Designations covered: The Migneint-Arenig-Dduallt is designated as SSSI, SAC and SPA. **This plan covers SAC and SPA features only** (Refer to 3.1) but SSSI interest is included in outline description.

There are six areas that are designated as SAC and SPA, but are not underpinned by the 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>

Summary map showing the SAC and SPA boundary covered by this document.



2.2 Outline Description

Migneint-Arenig-Dduallt is a large upland site that stretches between Ysbyty Ifan and Penmachno in the north down to Rhydyman in the south, and from Trawsfynydd in the west to just east of Llyn Celyn. It ranges in altitude from 300 m to 712 m. The northern section encompasses a high peatland plateau centred on Migneint and extending to Tomen y Mur in the west and Cwm Hesygn in the east, with higher points such as Arenig Fach around the rim. The southern section, south of the Afon Lliw, also comprises a high plateau surrounded by higher ground and dominated by Dduallt mountain. The central section, lies south of Cwm Prysor and Llyn Celyn and includes Moel Llyfnant and Moel y Slates as well as the Arenig Fawr mountain ridge which is the highest part of the whole site.

The SAC habitats are blanket bog, dry heath, wet heath, lakes and woodland

The site is also SPA for its breeding populations of hen harrier *Circus cyaneus*, merlin, *Falco columbarius* and peregrine, *Falco peregrinus*.

2.3 Outline of Past and Current Management

Historically, the main land use of this large upland block has been for rough grazing, with Welsh Black cattle being largely replaced by sheep over the years. The effects of grazing have been mixed- in some places it has reduced the extent and height of the dwarf shrubs, producing a shorter vegetation type, dominated by grasses. Whilst this change is clearly a shift away from the natural vegetation, and has mostly resulted in an impoverishment of the botanical interest, it has in a few areas been of benefit to small plants that are of interest, but would have been out-competed by the larger, more robust heath vegetation. In the distant past, woodlands would have extended well up the slopes of the hills, but having been felled hundreds of years ago, have been prevented from regenerating by grazing. A survey in 2001 suggested that a reduction in grazing would be beneficial to the vegetation of the site overall, as in most habitats it would allow a more diverse vegetation to develop.

Management for agricultural purposes has also included extensive ditching, resulting in drying of the peat and peaty soil, leading to a severe degradation of blanket bog through loss of species, particularly bog mosses and other wetland species. The drying out of bogs indirectly results in more grazing, due to the improved accessibility to livestock. Alterations in hydrology resulting from drainage operations also result in oxidation of peat, with a consequent release of nutrients leading to habitat loss. Drying may also affect peat erosion processes.

There has been a tradition of regular heather burning on some parts of the site, particularly around Cwmhesygn for grouse management reasons. Farmers have also burnt regularly to keep down coarse woody growth and to promote young heather and grass which is more palatable to domestic stock. Blanket bog has been burnt in the past, leading to a loss of *Sphagnum* mosses and an overall reduction in species diversity as species favoured by burning gain a competitive advantage. Domination by purple moor grass *Molinia* in species poor stands is not an issue within this SAC indeed *Molinia* is very localised and more noted as of interest than a problem. This species also forms a natural component of the relatively small area of the wet heath feature. This practise of burning may well have increased nutrient input and sedimentation into the lakes.

Peat cutting for fuel is known to have been practiced in some areas in the past (eg Cwmhesygn, Abergeirw), but this practice has long since ceased.

Conifer plantations feature prominently, with the Forestry Commission being a major landowner on the site. Areas of conifer crop included in the SSSI/SAC/SPA are in the process of being restored as mainly heath and blanket bog habitats. The (often failed) conifer crops are gradually being felled and not replanted, as it is not commercially viable to do so. There has been work carried out to thin conifers, block ditches, cut vegetation (heather) and provide grit, prompted by black grouse recovery projects and managed by FC/RSPB on FC land. There is currently a blanket bog LIFE project

specifically to restore the blanket bog SAC feature on FC land. The proposed work entails clearing all trees from specified areas, fencing a large area at Penaran and reintroducing pony/cattle grazing as well as blocking ditches and cutting paths to facilitate grazing. Areas of cleared conifer are difficult to restore to good condition because of the legacy of a grid of frequent drainage ditches, of sometimes 3m spacing, and the problems of abundant tree regeneration, both native species and conifers, which has been prompted by the history of afforestation. Such areas also, because of the damaged topography are hazardous to grazing stock.

Liming was carried out in 1991 on land surrounding Llynnau Gamallt, with the intention of reversing the acidification process and increasing fish stocks in the lakes. This operation, though it did, in the short term raise the pH of the lakes, and along with a large restocking exercise, saw an improvement in fish spawning and survival, was largely unsuccessful in its long term aims. The water quality in the outflow of Gamallt Fawr changed little in the medium to long term, and in 1995 the indication was that conditions for successful trout spawning were already beginning to decline. It also resulted in damage to the surrounding bog vegetation, particularly to sphagnum mosses, to aquatic plants in Llyn Gamallt Uchaf, and also may have affected invertebrate diversity in the two lakes.

2.4 Management Units

The site has been divided into units defined by stock proof fences as much of the site is grazed as open 'shared' mountain and/or as registered common land. This 'unitisation' may help practical communication about features, objectives, and management with owners and occupiers and targeted management to be achieved where agreed and appropriate. There are no NNR ownership units.

See attached maps showing the management units referred to in this plan.

The relationships between the management units is that they are all SAC and SPA. All units include all SPA features as they form either nesting or hunting territory for the feature species. All units (except 2, 11, 21, 22, 41, 54, 59, 62, 70, 78, 80, 81 and 82) have some components of the blanket bog and dry heath SAC features. Table 1 below highlights those units where, in addition to blanket bog, dry heath and SPA interest, the features of wet heath, woodland or lakes also occur.

Unit 15 (ISIS ref. No. 001218) comprises old compartment numbers (and names) as follows:
Unfenced land area - including 83A 83B 83C- CL21, 102- Fron, 101- Tai'n y Maes, 100- Ty Nant Eidda, 99- Ochr y Cefn Uchaf, 97B- Pen y Bont, 96- Ty Mawr Eidda, 84- CL25, 85- CL29, 86, 89A, 89E, 94-Bryniau Defaid, 93- Pant Glas, 92- Eidda fawr, 90A 90B 90C 90E1- CL25, 109A, 79, 45 45B- CL45, part 47A 47B- Forest Enterprise, 120- Blaen Eidda Isaf, 91 82A Pennant, 82B Hafod Ifan, 82C Blaen Eidda Isaf, 82D Penygeulan, 82F Dylasau Uchaf, 82G1 , 82H Fedw, 82J Hafod Las, 46 CL78.

Unit 38(ISIS ref. No. 001241) comprises old compartment numbers (and names) as follows:
65 Cwm Hesgyn, 69 Pentre, 70A Defaidty, 70B Nant Fach, Cilglassen.

Table 1 : Units including wet heath, lakes and woodland as well as blanket bog, dry heath and SPA bird features

Unit No.	ISIS ref.	Farm name & ref.	Wet heath	Lakes	Woods
Unit 1	001191	Dugoed - 119	✓		
Unit 4	001207	Eidda fawr - 105	✓		
Unit 6	001209	Pen y Bryn Eidda - 103	✓		
Unit 11	001214	Llyn Conwy - 117		✓	
Unit 12	001215	Penybont - 97A	✓		
Unit 13	001216	Pennant - 98A	✓		
Unit 15	001218	Unfenced land area	✓	✓	
Unit 16	001219	NT Llynnau gammallt - 49		✓	
Unit 22*	001225	Tyddyn Gwyn Bach - Carwad - 134	✓		
Unit 23*	001226	Bryn Rhug - 80	✓		
Unit 21	001224	Llyn Morwynion - 137		✓	
Unit 29	001232	Fedw - 115	✓		
Unit 38	001241	Rhiwlas		✓	
Unit 39	001242	Bwlch Grainiog (Nant Hir) - 68			✓
Unit 43	001246	Ty Nant - 59	✓		
Unit 45	001248	Blaen Eidda Isaf - 104	✓		
Unit 49	001252	Craignant - 49	✓		
Unit 51	001254	Craig yr Onwy, Llechwedd Hen - 56		✓	✓
Unit 52	001255	Rhydyfen - 55	✓		
Unit 55	001258	Nant Prysor Forestry - 78	✓		
Unit 56	001259	Llanerch Las – 51A	✓	✓	
Unit 57	001260	Tanrallt, RSPB - 44	✓	✓	
Unit 58	001261	Bryn Celynog - 42	✓	✓	
Unit 59	001262	Fadfilltir 129	✓		
Unit 60	001263	Glanllafar - 125	✓		
Unit 64	001267	Cae Gwair(Bryn Dedwydd) - 39		✓	
Unit 69	001272	CL46 Castell Hen - 37	✓		✓
Unit 70	001273	Llyn Arenig Fawr - 35		✓	
Unit 74	001277	Cynthog Ganol - 30E2 & Talybont - 30B2	✓		
Unit 77	001280	CL46 (part) Cynthog Ganol - 30E1, 31B	✓		
Unit 78	001281	Cynthog Ganol - 30F & 32	✓		
Unit 81	001284	CL46 Ty'n Cerrig - 30H & 77	✓		
Unit 83	001286	Ty Du - 31C			✓
Unit 85	001288	Foel Boeth, FCW - 21			✓
Unit 86	001289	Trawsgoed - 20	✓		
Unit 96	001299	Fedw Lwyd - 19	✓		
Unit 99	001302	Craig y Tan - 10, Also graze 16A, unfenced FCW land within this parcel			✓
Unit 101	001304	Cefn Maelan - 9	✓		
Unit 107	001310	Tyddyn Ronnen - 12	✓		
Unit 118	001976	Llywngwern - 6A			✓
Unit 119	002176	Hafod Wen - 130	✓		

*Unit not underpinned by SSSI

3. THE SAC and SPA 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>		
Annex I habitats that are a primary reason for selection of this site		
Blanket bog. *	NVC M1, M2, 17, 18, 19, 20	4.1
European dry heaths.	NVC H8, 9, 10, 12, 18, 21.	4.2
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site		
Northern Atlantic wet heaths with <i>Erica tetralix</i> .	NVC M15	4.2
Natural dystrophic lakes and ponds.	3160: Natural dystrophic lakes and ponds	4.3
Lakes (Oligotrophic to mesotrophic) standing waters	3130: Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	4.3
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.	NVC W11, 17.	4.4
<i>SPA features</i>		
Hen harrier	<i>Circus cyaneus</i>	4.5
Peregrine	<i>Falco peregrinus</i>	4.6
Merlin	<i>Falco columbarius</i>	4.7

*Priority SAC habitat

3.2 Special Features and Management Units

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:

- they are present in the unit but may be of less conservation importance than the key feature; and/or
- 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
- 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.

Migneint-Arenig-Dduallt SSSI/SAC/SPA is an upland ecosystem which forms a complex of interrelating habitats, with Key Habitats and Key Species occurring on the same piece of land.

The entire forms part of either nesting territory or hunting land for one or more of the SPA bird species. The intimate mosaic of habitats found on the site allows a variety of potential nesting and feeding zones. Since nest sites would not be viable without the surrounding feeding land, and nest sites can vary from year to year as the birds find suitable sites, so the three SPA species of the Migneint-Arenig-Dduallt must be considered as Key Species across the entire site.

The SAC habitats of blanket bog, dry heath and wet heath occur across the site in a complex pattern dictated by geology, soils, topography, hydrology and to some extent, past management. They occur across the site, and it is perfectly possible to have all of the habitats in any one parcel, and for them all to be considered as 'Key Habitats'.

Grazing management over the site or parcel should seek to maintain the habitats present, and where appropriate, restore degraded examples of the habitats through changes in management practices.

The dystrophic and oligotrophic/mesotrophic lakes are Key Habitats where they occur, but cannot be realistically be treated in isolation as they are affected by management of their respective catchments where one must be mindful of this Key habitat.

Oak woodlands occur at specific locations on the site and in more fragmented stands. Where oak woodland is present it should be treated as a Key Habitat. There are transitional habitats between this feature and heath which are important in their own right and where the balance between the two SAC features must be considered on a unit basis. Dry Heath is a primary SAC feature whereas the woodland is secondary so dry heath may have priority unless the woodland in that particular unit is particularly special in terms of lower plants for example. The dry heath may be particularly impoverished at the point of transition to woodland and actually benefit from scattered tree growth.

3.3 Conflicts of management

The main conflict of current management thinking occurs between black grouse and golden plover (species component of the breeding bird assemblage – SSSI feature only) and the SAC priority habitat of blanket bog and primary SAC feature of dry heath. This needs to be resolved on a unit basis.

Black grouse management on this SAC to date has involved thinning conifers and leaving densities of up to 130 trees per hectare (e.g. Penaran), mowing areas and blocking ditches. In this plan it is made clear that priority SAC feature blanket bog with trees is in “unfavourable condition” and that significant mowing -converting good blanket bog to NVC M20 (bog without the ericaceous layer over hare’s tail cotton grass)- for black grouse management also makes blanket bog unfavourable. Trees are not a natural component of Welsh blanket bog and will exacerbate the drying out of this habitat by transpiration to its detriment. We cannot afford to have additional drying as many examples of this habitat are affected by artificial drainage and are likely to become even more vulnerable to dehydration with climate change; wet, good quality blanket bog is very scarce indeed. The argument that there is so much blanket bog that some can be sacrificed is also untenable; this is not supported by the legislation and some areas of blanket bog within ‘black grouse management areas’ are of intrinsically good quality (NVC M17, 18 or 19 Refer to Table 2 page 13), and extensive.

There is naturally more leeway with the dry heath SAC feature (and other SSSI features) where it is acceptable to have a scattering of native trees, not conifers, and for this feature to be in “favourable condition”. One of the associated management problems of leaving trees rather than complete clearance is that the shelter and seeding from the ones left dramatically increases the rate at which further encroachment and increased tree density occurs. The existence of the plantation has altered the local environment to favour tree growth and without continued ‘gardening’ of the heath/ bog habitat the SAC is in danger of ‘reverting’ to a plantation ‘forest’. There are a number of ways of resolving this current conflict without compromising the SAC features particularly priority blanket bog. These include planning, to ensure trees are kept off blanket bog habitat, that black grouse management is targeted appropriately, having grazing instead of mowing and by managing areas adjacent and off the SAC. Trends in recorded black grouse numbers are given in the Annex.

Golden plover management within unit 32 – Y Gylchedd which essentially demands continuing the relatively heavy grazing of blanket bog has been agreed following consideration of the plight of this breeding species in Wales, the nature of the land and management needed. The condition of the land should however be reviewed to check that peat erosion is not worsening. **SSSI features are not covered by this plan (April 2008).**

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 which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Available through www.jncc.gov.uk and follow links to Protected Sites and Common Standards Monitoring.

4.1 Conservation Objective for SAC feature : Blanket Bog (EU 7130)

Comprising mainly bog pools and blanket mire of the following National Vegetation Classification (NVC) communities: - M1, M2, M3, 17, 18, 19 & 20. Other NVC communities, such as M15 and U6 may be considered as degraded blanket bog if on deep peat.

Vision For Feature 1

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

1. The total extent of the blanket bog area, including those areas that are considered unfavourable or currently degraded is maintained at the area present when designated, some 8100 ha in total. Vegetation mapped as NVC M20, currently approx. 1700ha, is always considered to be unfavourable. The area of the blanket bog feature is expanding into areas of heavily modified bog currently occupied by wet heath or acid grassland.
2. The location and distribution of the blanket bog is increasing at the expense of less desirable vegetation communities.
3. The degraded areas and currently unfavourable blanket bog are managed under a restoration programme so that the area and distribution of favourable blanket bog is increasing.
4. The typical species of the vegetation communities comprising the blanket bog SAC feature are frequent. Refer to Table 2.
5. The abundance and distribution of uncommon plants is maintained or increased. Refer to Table 1.
6. The structure of the blanket bog is maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. Peat erosion should be under control, and limited to apparently long-established plateau erosion systems.
7. Invasive non-native species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (*Spiraea*) are not present within the SAC and a species specific buffer area.
8. The blanket bog is free from all trees.
9. All factors affecting the achievement of these conditions are under control.

Table 1: Uncommon plants of the blanket bog feature

Species	Status	Notes
<i>Carex bigelowii</i>	Regionally Rare	Edges M19
<i>Carex magellanica</i>	Nationally Scarce	M2
<i>Carex pauciflora</i>	Regionally Rare	M2
<i>Andromeda polifolia</i>	Regionally Rare	M2, M18
<i>Listera cordata</i>	Locally uncommon	M19
<i>Sphagnum magellanicum</i>	Locally uncommon-indicator of good quality blanket bog	M18, M17
<i>Sphagnum affine</i>	Nationally scarce indicator of flushed bog	M18

Table 2. Typical species of the Blanket Bog SAC feature

NVC Vegetation community	Typical Species-constants and/or desirable*
Bog Pools	
M1 <i>Sphagnum denticulatum</i> bog pool community	<i>Eriophorum angustifolium</i> <i>Menyanthes trifoliata</i> <i>Sphagnum auriculatum</i> <i>Sphagnum cuspidatum</i>
M2 <i>Sphagnum cuspidatum/Sphagnum recurvum</i> bog pool community.	<i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Drosera rotundifolia</i> <i>Sphagnum recurvum</i> <i>Rhynchospora alba</i>
M3 <i>Eriophorum angustifolium</i> bog pool community.	<i>Eriophorum angustifolium</i>
Blanket Mire	
M17 <i>Trichophorum cespitosum-Eriophorum vaginatum</i> blanket mire. Characteristically frequent <i>Eriophorum vaginatum</i> , <i>Scirpus cespitosus</i> and <i>Molinia caerulea</i> .	<i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Molinia caerulea</i> <i>Narthecium ossifragum</i> <i>Potentilla erecta</i> <i>Scirpus cespitosus</i> <i>Sphagnum capillifolium</i> <i>Sphagnum papillosum</i> <i>Vaccinium vitis-idaea</i> *
M18 <i>Erica tetralix- Sphagnum papillosum</i> raised and blanket mire Particularly good quality blanket bog tending towards raised bog dominated by <i>Sphagna</i> . <i>Sphagnum papillosum</i> frequent (V-IV). <i>Sphagnum magellanicum</i> present often as just few clumps.	<i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Sphagnum capillifolium</i> <i>Sphagnum papillosum</i> <i>Vaccinium oxycoccus</i> * <i>Sphagnum magellanicum</i> *
M19 <i>Calluna vulgaris -Eriophorum vaginatum</i> blanket mire. <i>Sphagnum papillosum</i> (I-II)	<i>Calluna vulgaris</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Sphagnum capillifolium</i> <i>Vaccinium vitis-idaea</i> * <i>Empetrum nigrum</i> *
M20 <i>Eriophorum vaginatum</i> raised and blanket mire. Poor ombrogenous bog vegetation dominated by <i>Eriophorum vaginatum</i> tussocks.	<i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i>

Performance indicators for Blanket bog SAC Feature

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: Blanket Bog</i>	
<i>Attribute, rationale and other comments</i>	<i>Specified limits where appropriate</i>
<u>A1. Extent of blanket bog</u> Lower limit is based on current extent which must be maintained. The full extent is difficult to measure precisely as although there are extensive homogenous stands this feature also commonly occurs in mosaic with other habitats. The area given can only be regarded as approximate and best represented in map form – see below. The area of core blanket bog communities should be increasing through restoration management.	<i>Lower limit:</i> c.8100 ha ie current area. Land must be checked for this feature before any assessment takes place. No blanket bog area can be lost. <i>Upper limit:</i> None, naturally limited by geology, topography and rainfall.
<u>A2. Location and distribution of blanket bog</u> The current location and distribution within the SAC must be maintained.	
<u>A3. Degraded and currently unfavourable areas</u> Upper limit is based on known areas of NVC M20 and other areas of degraded blanket bog such as NVC U6 and M15 on deep peat. Ideally all degraded blanket bog should be restored.	<i>Upper Limit:</i> 1700 ha (of degraded bog).
<u>A4. Typical species</u> Typical species will be frequent and form the main dominants. Refer to table 2.	As guide to frequency refer to NVC tables.
<u>A5. Uncommon plants</u> Current populations of uncommon plants will flourish and expand where possible.	<i>Lower Limit:</i> current locations, abundance and vigour of plants.
<u>A6. Bog surface structure</u> The structure of the blanket bog is maintained and restored where appropriate to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. Ditches should be in filled or blocked to create pools. There should be no significant peat erosion.	<i>Limit:</i> To be defined as a pragmatic proportion of the current mapped drains including those which will infill and re-vegetate naturally over time.
<u>A7. Invasive non-native species</u> Invasive non-native species are aliens within the natural blanket bog communities. Their invasive nature means they threaten the integrity of the habitat by competition, shading and often drying of the blanket bog by transpiration. Invasive species can have a significant impact on extent, location and distribution of blanket bog unless control takes place.	The target should be none present within SAC and ‘buffer’ surrounding land to be determined on a species-specific basis.
<u>A8. Tree cover</u> Blanket bog in Wales has been naturally tree-less for a long time. Trees are present occasionally where this habitat is in mosaic on drier areas such as heath and acid grassland or crags away from grazing stock. Blanket bog that has been drained, and planted with conifers and is then cleared or fails is particularly prone to tree regeneration.	Blanket bog in favourable condition is tree-less. Target: reducing the current tree cover as part of restoration to favourable condition.

Performance indicators for factors affecting the feature: Blanket Bog	
Factor, rationale and other comments	Operational Limits
<p><u>F1. Grazing</u></p> <p>Blanket bogs are likely to have always been grazed to some extent, by a variety of herbivores. In an unmodified blanket bog, species composition is regulated by the rain water input and a naturally high water table. Without interference and within high rainfall areas the surface of the bog grows upwards, forming hummocks and hollows in the wettest areas as peat continually forms. This natural blanket bog has a low fairly constant vegetation height with a mattress of layered heather and other woody shrubs over a lower layer of <i>Eriophorum vaginatum</i>. If, as is often the case, the bog is modified, for example by gripping (drainage), burning or heavy grazing, the ‘natural’ system becomes unbalanced. Hence drained and/ or burnt blanket bog tends to have a greater dominance of heather which can become leggy. This can lead to perceived problems of stock access, and calls for further burning or draining to remedy this; resulting in a downward spiral. Mowing can be a short-term solution but in the longer term it is likely to lead to a decrease in ericoid cover.</p> <p>In the short term, it may be possible to achieve widespread stock dispersal by mowing non blanket bog vegetation areas/paths and to restore the naturally high water table by infilling and/or blocking drains. Overgrazing, often with burning, will degrade blanket bog from the better communities to NVC M20 and then to acid /marshy grassland unless restoration measures are put in place.</p>	<p>Favourable management is light summer grazing by sheep, cattle and /or ponies. This will often be at a rate of 0.05 LSU/ha/year (0.33 ewes) but could well be more depending on the land.</p> <p>Ponies or cattle have advantages over sheep due to their tendency to graze coarser grass and rush vegetation without adversely affecting heather/ericaceous cover. Sheep will graze heather intensively in the autumn/winter.</p>
<p><u>F2. Burning</u></p> <p>Blanket bog should not be burnt, as burning damages important plant and animal species, especially bog mosses and invertebrates and interferes with the natural development of this vegetation. Past burning practice is likely to be at least partly responsible for the relative rarity of burning-sensitive species. Burning, in combination with intense grazing, is also responsible for damage and loss of areas of good quality blanket bog in the site. Burns scorch and kill bog mosses such as <i>Sphagnum magellanicum</i> and <i>S.papillosum</i> and other lower plants, removing the heather/ericaceous layer, to reveal the blanket of <i>Eriophorum vaginatum</i> underneath.</p> <p>The cotton grass recovers well from fire, benefits from the ‘fertiliser’ input of ash, and then has a competitive advantage over other plants which can only recolonise slowly. Thus a NVC M19 or 18 bog is converted to the degraded NVC M20 and becomes unfavourable.</p> <p>There are occasional incidences of flash burns that pass quickly through the bog and burn the heather with little damage to the underlying vegetation, but these tend to occur more through luck rather than judgement, and thus burning is best avoided.</p>	<p>No burning</p>
<p><u>F3. Drainage ditches/ moor grips</u></p> <p>The wetland habitats and features are profoundly influenced by alterations to the natural drainage regime of the site. Blanket bog is a nutrient-poor system, which arises in areas with a wet, cool climate and a suitable topography (level or gently sloping ground) with little or no water flowing in from surrounding land. Artificial drains cause the bog to dry out and to deteriorate adjacent to the drains. The drains may bring nutrients to the system and the vegetation changes because the bog is no longer only receiving nutrients from the rain. Also, if the</p>	<p>No new drainage ditches. We should also seek to infill/block existing ditches wherever possible and to have targets for restoration.</p>

<p>drying peat surface becomes exposed, it then oxidises which releases nutrients into the system, dissolved organic carbon into water courses, and carbon dioxide into the atmosphere. This results in similar changes to the sensitive vegetation as well as increased peat erosion. For these reasons, it is important that there should be no new drainage ditches dug in this habitat, and wherever possible old drainage ditches should be blocked or encouraged to infill. This habitat forms a natural sponge which, provided it is not ditched, helps to reduce floods lower down the river system in rainy times while providing plenty of water during summer droughts.</p>	
<p>F4. Recreation and access The site is designated as access land, although most recreational use is believed to be focused on the existing PROW network. Access can cause erosion and compaction and lead to pressure for infra-structure which can damage or destroy parts of the blanket bog if sited on it.</p>	<p>No visible erosion or compaction of blanket bog and no infrastructure on this priority habitat.</p>
<p>F5. Off-road vehicle use Off road vehicles have caused damage on the site in the past. Although this has not been widespread, the site is vulnerable to significant damage should off-roading become a problem, and it is therefore discouraged. Off road vehicles can cause erosion and compaction and lead to pressure for new routes which can damage or destroy parts of the blanket bog if sited on it or immediately adjacent.</p>	<p>Maintain vigilance, record and report any illegal off-road use seen. No new routes on or very near blanket bog.</p>
<p>F6. Afforestation/ conifer encroachment The presence of trees/conifers on blanket bog immediately places the conservation status of the bog as 'unfavourable'. Afforestation with the accompanying ditching and track construction has damaged blanket bog in the past and continues to cause degradation. The drains continue to function, causing drying of the bog and direct damage/loss of blanket bog vegetation to ditch and spoil. Conifer/trees adjacent and on the blanket bog provide a seed-source for further encroachment, as well as continuing to dry the bog through transpiration. There will be a presumption against afforestation and other tree planting on the mire vegetation. We hope to encourage and implement further rehabilitation of afforested areas of bog by removing trees, blocking ditches and reintroducing light grazing.</p>	<p>The blanket bog should be treeless. No new afforestation or tree planting on blanket bog. (Trees may be acceptable on neighbouring habitats as adjacent stands or mosaic provided seeding in to the blanket bog is not a problem and other interest has been considered.)</p>
<p>F7. Mineral exploration Current quarries(numerous quarries and levels including Foel Gron, Drum, Arenig, Maen grugog, Braich Ddu, Nant Drewi and immediately adjacent and surrounded by the SAC/SPA Croesyddwyafon) are not worked at present and have had some degree of landscaping. Planning permission is still extant at some locations within the SAC/SPA. As Migneint-Arenig-Dduallt lies within Snowdonia National Park, mineral exploration is less likely to gain approval because of the potential effects on the landscape, apart from likely concerns regarding the Natura 2000 site..</p>	<p>Quarrying on any significant scale is unlikely to be acceptable because of effects on blanket bog or other interest.</p>
<p>F8. Peat erosion Early human activities and climatic change are now believed to have initiated much of this erosion, and some areas of eroded bog may be of considerable antiquity. Precise reasons for the continuing process are uncertain, but current grazing and trampling by stock are significant contributory factors. There is significant erosion of peat taking place on some areas of blanket bog, such as south-west and north-east of Llyn Conwy. Stock reductions may not provide satisfactory conditions for recovery within a reasonable time, in which case carefully sited, fenced exclosures and possibly sluice-boarding may be needed to allow vegetation recovery and stabilisation of bare peat.</p>	<p>Peat erosion, ie visible bare peat, should not increase in area above the current 2008. Any significant area of visible erosion would mean the blanket bog was unfavourable in that unit.</p>

<p>This was achieved very effectively in Cwm Idwal NNR, over a period of just a few years. Peat erosion on this site also has implications for Llyn Tegid Ramsar site as Migneint –Arenig-Dduallt forms a substantial part of its catchment. Peat erosion occurring on common land can be difficult to resolve.</p>	
<p>F9. Atmospheric deposition & liming. Atmospheric deposition is a key factor for this ombrogenous ('rain-fed') habitat. According to the Air Pollution Information Service (www.apis.ac.uk), current levels of nitrogen deposition estimated at 22.1 kg N/ha/yr are towards the upper end of the estimated critical load for this habitat (5-10 kg N/ha/year); this is likely to enhance the vulnerability of bog-mosses to competition from graminoids, and also increase the susceptibility of heather in particular to a range of factors, including leaf beetle damage.</p> <p>Catchment liming is harmful to oligotrophic Sphagna and will not be consented on areas of blanket bog.</p>	<p>Policy implementation at a UK level is achieving reductions in atmospheric deposition; this work needs to be continued, and any potential point source emissions carefully screened and controlled.</p> <p><u>N deposition.</u> The UK Government target should be to ensure less than 10 kg N/ha/yr.</p>
<p>F10. Climate change. Blanket bog will be vulnerable to the anticipated scenario of increased winter-time rainfall and more severe and prolonged summer drought. Practical measures which can be employed to reduce the impacts of climate change include hydrological repair (primarily ditch blocking), conifer removal, and prevention of burning.</p>	<p>See limits for co-factors cited under F12.</p>

4.2 Conservation Objective for the European dry heaths (EU 4030) and Northern Atlantic wet heath with *Erica tetralix* SAC features (EU 4010)

- Dry Heath- NVC communities: H8, 9, 10, 12, 18, 21.
- Wet Heath- NVC communities: M15

Vision for Feature 2

The vision for the heath land SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:

- 1 The total extent of the dry heath area, including those areas that are 'degraded' (approx 2600ha) shall at least be maintained as present when designated. The degraded areas and currently unfavourable dry heath should be managed under a restoration programme. The area of dry heath should increase at the expense of less desirable vegetation communities such as acid grassland. The total extent of the wet heath area, including those areas that are 'degraded' (approx 400 ha) shall at least be maintained as present when designated. The area of wet heath should increase in overall at the expense of less desirable vegetation communities. Some areas of wet heath which are degraded blanket bog may be restored to that priority habitat provided that there is a net gain of wet heath within the SAC.
- 2 The distribution of the dry and wet heath will at least be as shown on Maps 1-4 and will preferably be increasing as it is restored in additional areas.
- 3 The typical species of the vegetation communities comprising the dry heath and wet heath will be frequent and abundant. See Table 1.
- 4 The abundance and distribution of uncommon plants (see Table 2) will be maintained or increased.
- 5 The structure of the heath should be maintained and restored, to show natural regeneration by layering and seeding, and to ensure that the component vegetation communities are naturally

diverse (refer also to 3 and 4 above). In practise some stands will benefit from being taller with very mature heather (eg NVC H 21) and others including wet heath from having a medium to short structure, less than 30cms height. Signs of overgrazing, including 'suppressed', 'topiary' or 'drumstick' growth habits will not be apparent.

- 6 Invasive non-native species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (*Spiraea*) will not be present.
- 7 The surface of the heath will be generally free from trees and at most have only a few individuals at a density of no more than 2 per hectare. Exceptions to this rule are transition zones from woodland to heath land where trees may be denser grading to open heath. Limits for woodland transition zones should be set on a unit or sub-unit basis.
- 8 All factors affecting the achievement of these conditions are under control.

Table 1. Typical species of the Dry heath and Wet heath SAC feature

NVC Vegetation community	Typical Species-constants
Dry Heath	
<p><u>H8</u> <i>Calluna vulgaris-Ulex gallii</i> heath</p> <p>Very localised heath community –small areas</p>	<p><u>Constants:</u> <i>Calluna vulgaris</i> <i>Ulex gallii</i> <i>Erica cinerea</i></p>
<p><u>H9</u> <i>Calluna vulgaris- Deschampsia flexuosa</i> heath</p> <p>Very localised heath community –small areas</p>	<p><u>Constants:</u> <i>Calluna vulgaris</i> <i>Deschampsia flexuosa</i></p>
<p><u>H10</u> <i>Calluna vulagirs – Erica cinerea</i> heath</p> <p>Very localised heath community –small areas</p>	<p><u>Constants:</u> <i>Calluna vulgaris</i> <i>Erica cinerea</i> <i>Potentilla erecta</i></p>
<p><u>H12</u> <i>Calluna vulgaris – Vaccinium myrtillus</i> heath</p> <p>Most widespread community covering greatest area.</p>	<p><u>Constants:</u> <i>Calluna vulgaris</i> <i>Descampsia fleuxuosa</i> <i>Vaccinium myrtillus</i> <i>Dicranum scoparium</i> <i>Hypnum jutlandicum</i> <i>Pleurozium schreberi</i></p>
<p><u>H18</u> <i>Vaccinium myrtillus – Deschampsia flexuosa</i> heath</p> <p><i>V. myrtillus</i> most frequent and generally most abundant ericoid, with <i>Calluna vulgaris</i> inconspicuous- a variety of moss-rich and grassy sub-shrub vegetation.</p> <p>Occasional occurrence –fairly extensive stands often in areas of heavy grazing and apparently derived from NVC H12. Small areas at high altitude, such as Arenig Fawr appear to be more ‘natural’.</p>	<p><u>Constants:</u> <i>Deschampsia flexuosa</i> <i>Vaccinium myrtillus</i> <i>Dicranum scoparium</i> <i>Pleurozium schreberi</i> <i>Galium saxatile</i> <i>Sphagnum papillosum</i> V-IV <i>Sphagnum tenellum</i> <i>Odontoschisma sphagni</i></p>
<p><u>H21</u> <i>Calluna vulgaris– Vaccinium myrtillus – Sphagnum capillifolium</i> heath</p> <p>Heath with a mixed canopy of sub-shrubs with damp layer of luxuriant bryophytes in best examples. Often on north or west facing slopes or on the edge of blanket bog. Tends to be very local. The presence of frequent and abundant <i>Sphagnum capillifolium</i> on heath rather than blanket bog is characteristic of H21. The presence of <i>Blechnum spicant</i> and other ferns can help to pick out this community.</p> <p>Very localised heath community –small areas</p>	<p><u>Constants:</u> <i>Calluna vulgaris</i> <i>Vaccinium myrtillus</i> <i>Deschampsia flexuosa</i> <i>Rhytidiadelphus loreus</i> <i>Pleurozium schreberi</i> <i>Hylocomium spendens</i> <i>Hypnum cupressiforme</i> <i>Dicranum scoparium</i> <i>Plagio undulatum</i> <i>Blechnum spicant</i> <i>Sphagnum capillifolium</i> <i>Potentilla erecta</i></p>
Wet heath	
<p><u>M15</u> <i>Scirpus cespitosus – Erica tetralix</i> wet heath</p> <p><i>Molinia caerulea</i> constant with frequent <i>Scirpus cespitosus</i> characterises this vegetation. Variable with mixtures of constants. <i>Eriophorum vaginatum</i> should be absent or very infrequent. If this species is frequent check that you are not on blanket bog or consider restoration to that priority SAC feature.</p> <p>Localised heath community –relatively small areas</p>	<p><i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Molinia caerulea</i> <i>Potentilla erecta</i> <i>Scirpus cespitosus</i></p>

Performance indicators for the dry and wet heath SAC Features

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. More detail on factors and management is given in section 5 of this plan.

Performance indicators for features condition: heath		
Attribute	Attribute rationale and other comments	Specified limits
A1. Extent of heath	Lower limit is based on current extent of dry and wet heath estimated 15% cover (3000 ha) to an area of approx. 25% (5000 ha). Of which montane heath is only 0.5 ha. Dry heath currently covers nearly 13% of the site (2600 ha), and wet heath covers nearly 2% (400 ha) of the site.	<i>Lower limit:</i> maintain current extent including montane heath currently only 0.5 ha (Arenig fach). <i>Upper limit:</i> None, as defined by geology, soils and topography and provided expansion is at the expense of less desirable vegetation such as acid grassland. Aim to increase especially localised communities such as montane heath.
A2. Distribution of heath		May be possible to increase distribution of montane heath on to Arenig Fawr.
A3. Typical species	Species listed in table 2 will be frequent and abundant.	Refer to site quadrat data and <i>Rodwell (1991)</i>
A4. Uncommon plants	Current populations of uncommon plants will flourish and expand where possible.	<i>Upper Limit:</i> none set <i>Lower Limit:</i> as recorded at time of SSSI designation.
A5. Heath land structure	The heath surface should be regenerating and characteristic of the vegetation community and generally at a height where there is the most plant diversity.	Set limits relevant to particular location/stand in context of whole site.
A6. Non-native species	Non-native species especially invasive species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spirea</i>) should not be present. Refer to factors.	<i>Acceptable limit:</i> None present within SAC. <i>Target:</i> None present within species-specific buffer zones around SAC. Refer to factors.

Table 2: Uncommon plants of the heath features

Species	Status	Notes-guide to presence in NVC communities
<i>Antennaria dioica</i>	Regionally Rare	H10
<i>Carex bigelowii</i>	Regionally Rare	H18, H21, Montane heath U10
<i>Listera cordata</i>	Locally uncommon	H12,H21
<i>Salix herbacea</i>	Regionally Rare	Montane heath U10

<i>Performance indicators for factors affecting the features: heath</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Grazing	<p>Heaths are likely to have always been grazed to some extent, by a variety of herbivores.</p> <p>In an unmodified heathland, species composition is regulated by soil composition, water levels, altitude and aspect, as well as factors such as grazing. Where grazing is too high, or where heavy grazing immediately follows an incident such as a burn, the species composition can become heavily modified and at worse can be replaced by acid grassland.</p> <p>Signs of overgrazing include ‘suppressed’, ‘topiary’ or ‘drumstick’ growth habits of heather.</p>	<p>Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes) for dry heath, and 0.3LSU/ha/yr (cattle/ponies) for wet heath with frequent/dominant purple moor grass.</p>
F2 Burning	<p>Burning can be damaging to some types of dry heath and should not be permitted in these areas. Past burning of dry heath, combined with intense grazing has resulted in the loss of areas of dry heath to acid grassland dominated by <i>Festuca/Agrostis</i> or <i>Nardus</i>. Over-frequent burning should be avoided by agreeing a minimum rotation length</p> <p>In certain situations, controlled burning of specific patches may also be a useful management tool to encourage sheep to cover an area more evenly. Within species-poor stands of often NVC H12 burning can be benign provided it is not followed by locally intense grazing as stock concentrate on recently burnt areas.</p> <p>The extent of Montane heath (0.5ha), found at Arenig Fach, is largely limited by altitude, exposure and other climatic factors, but is also very vulnerable to over grazing, trampling and burning.</p>	<ul style="list-style-type: none"> • Burning should have clearly stated objectives and be limited to : appropriate areas of dry heath (usually NVC H12), at a small scale, well controlled and following good practise and codes. Hence burning of some stands of dry heath may be consented on a case-by-case basis. • Wet heath should not be burnt. • Heath on steep rocky slopes with thin soils or heath with abundant lower plants (NVC H 21) or uncommon species such as lesser twayblade orchids (see table 2) should not be burnt. • Montane heath should not be burnt
F3. Mowing	<p>Cutting can be a viable alternative to burning and offers a controlled, safe way to manage heather without the associated risks of fires. Machinery can sometimes access areas where burning would not be appropriate, although heather may be slower to regenerate, and build up of brash can also retard regrowth on occasions.</p>	<p>Cutting limited to appropriate areas of heath, at a small scale, and agreed on a case-by-case basis.</p>
F4. Afforestation/ conifer encroachment	<p>The presence of conifers (and other invasive non-native species) on heaths immediately places the conservation</p>	<p>No planting of conifers or other trees on heath. A programme of removing trees and restoring heath habitat</p>

	<p>status of the heath as 'unfavourable'. Conifers/trees shade out the heath vegetation and acidify the groundwater. Associated activities such as heavy plant access, planting, fertiliser input, construction and maintenance of access tracks, and drainage works lead to further damage of the heath. The trees also provide seed-source of future conifers to encroach further out onto the heath.</p>	should be actioned.
F5. Drainage ditches/ moor grips	<p>Drainage works are carried out to dry the land out but this is not desirable where it leads to drying of the peat soils supporting heath, especially wet or humid 'dry' heath (NVC H21). Changes in soil chemistry, erosion and the changes to the vegetation structure covered in F1 above.</p>	No new drainage ditches or drainage work affecting heath land.
F6. Bracken	<p>Bracken is a natural component of the moorland edge communities. However, where bracken is encroaching at the expense of dry heath, some form of control may be required.</p>	Defined limits for bracken and bracken encroachment bordering heath. The CSM limit is less than 10% however this level is high for most stands of heath and too low for heath grading into scrub/woodland.
F7. Development	<p>This factor covers any form of development including construction and maintenance of tracks, erection of infrastructure, masts, towers or turbines as well as quarrying. Current planning policy is not to approve large-scale wind turbine development within Snowdonia National Park.</p>	Assessment of plans and projects
F8. Recreation and access	<p>Certain areas such as the summit of Arenig Fawr, one of the most visited parts of the site, are particularly vulnerable. Trampling by people, combined with the effects of high stocking levels. Erosion may be caused or made worse by visitors and this is of concern, particularly if access pressure increases.</p>	<p>The site is designated as access land, although most recreational use is believed to be focused on the existing PROW network.</p> <p>Surveillance and monitoring is required to define limits.</p>
F9. Off-road vehicle use	<p>Off- road vehicles have caused damage on the site in the past. Although this has not been widespread, the heath land is vulnerable to significant damage should off-roading become a problem.</p>	Maintain vigilance, record and report any illegal off-road use seen.
F10. Non-native species	<p>Non-native species especially invasive species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spiraea</i>) should not be present. Some non-native species are relatively benign and may be tolerated particularly when it is not practical to control such as Canada geese.</p>	<p>No conifers, rhododendron, Japanese knotweed, Himalayan balsam or bridewort (<i>Spiraea</i>).</p> <p>Keep records of other species such as Canada geese now breeding in the lakes and consider research to check if the impact is benign.</p>
F 11. Agricultural improvement	<p>Adjacent areas have certainly been burnt, drained, ploughed and reseeded in the past, or simply converted within the</p>	No further agricultural improvement or management resulting in adverse impact on heaths.

	<p>site from heath land to grassland by a pattern of burning and grazing over the years. Application of fertiliser causes a loss or reduction in many species typical of semi-natural habitats as they are no longer able to compete, while ploughing and reseeded causes direct destruction of the habitats.</p>	<p>There should be a presumption against ploughing, fertilising and/or re-seeding any of the semi-natural habitats on this site.</p> <p>Opportunities should be sought to restore agriculturally improved land including acid grassland to heath.</p>
F12. Physical environment	<p>The geology, geomorphology, topography, hydrology and soils all have the ability to dictate or limit what habitats occur on the Migneint-Arenig Dduallt. They also</p>	<p>The natural physical parameters provide a useful guide to potential areas for the successful restoration of degraded heaths.</p>
F13. Climate change	<p>Climate change has the potential to affect the integrity of the site. Some species may die out and others may colonise as their ranges contract or expand. These changes are beyond the scope of this document.</p>	<p>U.K monitoring and policy</p>

4.3 Conservation Objectives for the lake SAC features.

Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (EU 3130) and for natural dystrophic lakes and ponds (EU code 3160)

Vision for Feature 3

Migneint-Arenig-Dduallt has 22 lakes of more than 0.5ha in area, and many more smaller pools. Although these nominally consist of two distinct types (clear-water and peaty), in practice the water bodies on the site span the full range from very clear lakes such as Llyn Arenig Fawr, to typical peaty lakes such as Llyn y Dywarchen. Climate change and recovery from acidification is expected to lead to increased peat staining of many of these water bodies, but it is essential that this situation is not exacerbated by inappropriate land management.

The vision for the oligotrophic to mesotrophic (clear-water) and dystrophic (peaty) lakes SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:

- 1 The total extent of the clear-water and peaty lakes shall be maintained as indicated on maps 1 – 4, some x ha of open water/swamp and immediate lake basin, as visible on air photographs. The lake condition is intrinsically linked to the condition of the catchment therefore the catchments should be maintained in at least their current condition (including vegetation cover, drainage and appropriate management ie not over grazing and burning).
- 2 The location of the clear-water and peaty lakes will be as shown on Maps 1-4 and as referred to by name in the table below.
- 3 The typical species, as listed following, of the vegetation communities comprising the **clear-water lakes** SAC feature will be common.

The vegetation community is characterised by amphibious short perennial vegetation, with shoreweed *Littorella uniflora* being considered as the defining component. This species often occurs in association with water lobelia *Lobelia dortmanna*, bog pondweed *Potamogeton polygonifolius*, quillwort *Isoetes lacustris*, bulbous rush *Juncus bulbosus*, alternate water milfoil *Myriophyllum alterniflorum* and floating water bur-reed *Sparganium angustifolium*. On Migneint-Arenig-Dduallt all the above species are present, together with yellow water-lily *Nuphar lutea*, white water-lily *Nymphaea alba*, smooth stonewort *Nitella flexilis*, lesser bladderwort *Utricularia minor* and the nationally scarce slender stonewort *Nitella gracilis*.

In the case of **peaty lakes**, these water bodies are very acidic and poor in plant nutrients. Their water has a high humic acid content and is usually stained dark brown through exposure to peat. Most examples are small (less than 5 ha in extent), shallow, and contain a limited range of flora and fauna, with the principal aquatic plants being *Sphagnum*, floating bur-reed and water lilies. The pools are naturally species-poor and a littoral zone is often absent. Fringing vegetation is that characteristic of the habitat in which the pools occur.

- 4 All factors affecting the achievement of these conditions are under control.

SAC Features: Lakes - Oligotrophic or Dystrophic

Unit No.	ISIS ref.	Lake name & old compt. ref.	Oligotrophic or Dystrophic
Unit 51	1254	Llyn Arenig Fach - part 56B	Oligotrophic.
Unit 70	1237	Llyn Arenig Fawr - 35	Oligotrophic.
Unit 15	1218	Llyn Conglog-bach - part 46	Oligotrophic.
Unit 15	1218	Llyn Conglog-mawr - part 46	Oligotrophic.
Unit 11	1214	Llyn Conwy - 117	Oligotrophic.
Unit 38	1241	Llyn Hesgyn - 65	Oligotrophic.
Unit 58	1262	Llyn Hiraethlyn - 128	Oligotrophic.
Unit 21	1224	Llyn Morwynion - 139	Oligotrophic.
Unit 57	1260	Llyn y Garn - part 44	Oligotrophic.
Unit 15	1218	Llyn y Graig-wen - part 45	Unknown
Unit 15	1218	Llyn yr Oerfel - part 45	Oligotrophic.
Unit 16	1219	Llynnau Gamallt - part 49	Oligotrophic.
Unit 56	1259	Llyn Cors-y-barcud - 51A	Oligotrophic.
Unit 64	1267	Llyn Tryweryn - part 39	Dystrophic
Unit 15	1218	Llyn y Dywarchen - part 45	Dystrophic
Unit 15	1218	Llyn Serw - part 82B	Dystrophic
Unit 15	1218	Llyn Dubach y Bont - part 45	Dystrophic

Performance indicators for clear-water and peaty lakes SAC Features

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. Since there is considerable variation across the site, these targets may have to be adjusted to match individual lakes in some cases.

<i>Performance indicators for feature condition:lakes</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of all lakes	Lower limit is based on current extent	<i>Lower limit:</i> current. <i>Upper limit:</i> none, as defined by geology and topography.
A2. Location of clear-water and peaty lakes		
A3. Typical species	Clear-water lakes: Characteristic species are <i>Littorella uniflora</i> ; <i>Lobelia dortmanna</i> ; <i>Isoetes</i> spp.	<i>Upper Limit:</i> none set. <i>Lower Limit:</i> Characteristic species will be at least Frequent in each of the clear-water lakes, except where natural conditions are limiting (e.g. deep peat). No loss of species compared to 2004 baseline (Burgess et al. 2006)
A4. Uncommon plants - <i>Luronium natans</i> - <i>Nitella gracilis</i>	Current populations of uncommon plants will flourish and expand where possible. <i>Luronium natans</i> is present in Llyn Hiraethlyn (Unit 59) and Llyn y Garn. <i>Nitella gracilis</i> is present in Llyn Conglog-Mawr (Unit 15)	<i>Upper Limit:</i> none set <i>Lower Limit:</i> current <i>Luronium natans</i> was not recorded in Llyn Hiraethlyn in the last survey but this species is easily missed.
A5. Invasive species	Invasive species are undesirable and can out compete native species. Considered further in factors.	<i>Lower Limit:</i> none present
A6. Water Quality	Water quality needs to be sufficient to support a healthy lake ecosystem. Nutrients, acidity and water transparency are particularly critical for this.	(All lakes) Acid Neutralising Capacity (ANC) Upper limit: None set Lower limit: <20 microequivalents /

	<p>In dystrophic lakes, nutrient dynamics are relatively poorly understood. For this reason no nutrient targets have been set. However, nutrient levels still require surveillance as part of the routine monitoring programme.</p> <p>The ecosystem of clear-water lakes depends upon light penetrating the water column. Although this can be measured using a Secchi disc, a more reliable indicator of long-term conditions is given by the maximum depth at which submerged plants will grow.</p> <p>Peaty lakes are characterised by heavily peat-stained water with poor light penetration. Deviation from these conditions is likely to indicate problems such as acidification. Since few plants grow in these lakes, a Secchi disc is the most appropriate measuring device.</p>	<p>litre during any sampling event.</p> <p>(Clear-water lakes only) Total Phosphate (TP) <i>Upper limit:</i> Annual Mean <10 microgrammes / litre. <i>Lower limit:</i> None set</p> <p>(Clear-water lakes) Maximum depth of plant colonization <i>Upper Limit:</i> None set <i>Lower Limit:</i> No deterioration from current.</p> <p>(Peaty lakes) Secchi disk depth <i>Upper Limit:</i> 1m Secchi disk depth <i>Lower Limit:</i> None set.</p>
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Performance indicators for factors affecting the feature:lakes		
Factor	Factor rationale and other comments	Operational Limits
F1. Catchment management	<p>Drainage/moor grips can lead to drying of the adjacent peat, changes in soil chemistry, erosion, release of dissolved organic carbon, changes to the vegetation structure and increased sedimentation. Enrichment and other pollution draining into the lakes from the catchment is also undesirable.</p> <p>Areas of the site have certainly been burnt, drained, ploughed and reseeded in the past, or simply converted from heathland to grassland by a pattern of burning and grazing over the years. This can result in increased eutrophication of watercourses.</p>	<p>No new drainage ditches. We should also seek to block existing ditches wherever possible.</p> <p>Review</p> <p>No further agricultural improvement</p> <p>Assessment of plans and projects</p>
F2. Recreation and access, inc fishing and watersports.	<p>Many lakes on the site are also used for fishing by a variety of clubs. In the past, lime has been applied to Llynnau Gamallt in order to reduce the acidity for fishery purposes.</p>	<p>The dominance of peaty soils and preponderance of lime-sensitive species makes liming inappropriate across much of the site. Liming or other interference with water quality should be thoroughly scientifically justified.</p> <p>Assessment of plans and projects</p>
F3. Off-road vehicle use	<p>Off road vehicles have caused damage on the SAC (including close to Llyn Dubach y Bont) in the past, and can cause pollution and siltation in the lake catchments.</p>	<p>Maintain vigilance, record and report any illegal off-road use seen. Although this has not been widespread, the site is vulnerable to significant damage should off-roading become a problem, and it is therefore discouraged by signage.</p>
F4. Alien species	<p>Species of water weed such as Canadian pondweed and birds e.g Canada geese may be an issue in the future.</p>	<p>Surveillance</p>

F5. Climate change	Climate change has the potential to effect the integrity of the site. Some species may die out and others may colonise as their ranges contract or expand. These changes are beyond the scope of this document.	U.K monitoring programme
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4.4 Conservation Objective for the woodland SAC Feature : Old sessile oakwoods with *Ilex* and *Blechnum* Woodland

- NVC communities: W11 & W17
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Vision for Feature 4

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

1. The total extent of the woodland area, including woodland canopy and scrub, woodland glades and associated dry heath, bracken and grassland shall be maintained as indicated on the map in the annex, of 67 ha plus additional areas of c.13ha (not mapped) giving a total of approx.80 ha. Broadleaved woodland and scrub currently covers about 0.4% of the site (and bracken over 2% (c. 450 ha).
2. The location of the woodland SAC feature will be as shown on Maps in annex 1. Woodlands include.
Coed Dol- Fudr(SH 831318), Coed Gordderw (SH838336), Coed Maen y Menyn (SH 848354) and Coed Boch-y-Rhaeadr (SH 843398).
3. The tree canopy percentage cover within the woodland area (see maps 1 - 4) shall be no less than 85% (excepting natural catastrophic events).
4. The canopy and shrub layer comprises locally native species, as indicated in Table 2, typical of this upland woodland which is less oak and more birch dominated than more lowland examples of this SAC feature.
5. There shall be sufficient natural regeneration of locally native trees and shrubs to maintain the woodland canopy and shrub layer, by filling gaps and allowing the recruitment of young trees, and encouraging a varied age structure.
6. The typical ground layer species of the woodland SAC feature will be common, see Table 3. It is important for most of the woodland SAC that the vegetation does not become rank and overgrown with a height above 40cm and/or dominated by species such as bramble, ivy and young holly. Limits may be set on a unit or compartment basis. Typical lower plants including oceanic species (refer to Table 2 below for an indicative list where known records are ticked) should continue to be abundant and/or maintained.
7. The abundance and distribution of uncommon mosses, liverworts, lichens and ferns, will be maintained or increased.
8. There will be a defined number of mature trees per hectare within the existing tree canopy on a unit basis. This will need to be defined by diameter for the upland situation where comparable trees at lower altitude are of c60cm diameter plus for oak and ash and/or with signs of decay, holes etc.
9. Dead wood will be present and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). Volumes of deadwood are currently at relatively low levels because the woodlands, in general, have an even-age structure and lack mature trees. Some lower plants are dead wood specialists but these woodlands tend to lack the rare dead wood invertebrate assemblage found in other parts of the UK.
10. Invasive non-native species such as rhododendron, Japanese knotweed and Himalayan balsam will not be present.
11. All factors affecting the achievement of these conditions are under control.

Table 2: Indicative list of Atlantic, sub-Atlantic & western British mosses & liverworts which may be found within the oak woods SAC feature.

✓ **Species ticked** have been recorded from M-A-Dd woodland SAC feature which is acidic and lacks base-rich areas.

Atlantic species of liverwort	Western British species of Liverwort	Sub-Atlantic species of Moss
<i>Adelanthus decipiens</i>	<i>Bazzania tricrenata</i> ✓	<i>Breutelia chrysocoma</i>
<i>Aphanolejeunea microscopica</i>	<i>Bazzania trilobata</i> ✓	<i>Campylopus atrovirens</i>
<i>Drepanolejeunea hamatifolia</i>	<i>Frullania fragilifolia</i>	<i>Campylopus flexuosus</i>
<i>Frullania teneriffae</i>	<i>Metzgeria conjugata</i>	<i>Entosthodon attenuatus</i>
<i>Gymnomitrium crenulatum</i>	<i>Mylia taylorii</i> ✓	<i>Entosthodon obtusus</i>
<i>Harpalejeunea molleri</i>	<i>Nowellia curvifolia</i>	<i>Fontinalis squamosa</i>
<i>Herbertus aduncus</i> ssp. <i>hutchinsiae</i>	<i>Riccardia chamedryfolia</i>	<i>Heterocladium heteropterum</i>
<i>Jubula hutchinsiae</i>	<i>Riccardia palmate</i>	<i>Hookeria lucens</i> ✓
<i>Lejeunea lamacerina</i>	<i>Scapania umbrosa</i> ✓	<i>Hyocomium armoricum</i>
<i>Lepidozia cupressina</i> ✓		<i>Hygrohypnum eugyrium</i>
<i>Lepidozia pearsonii</i> ✓		
<i>Marchesinia mackaii</i>		<i>Hypnum resupinatum</i>
<i>Plagiochila exigua</i>		<i>Pterogonium gracile</i>
<i>Plagiochila killarniensis</i>	Oceanic species of liverwort	<i>Ptychomitrium polyphyllum</i>
<i>Plagiochila punctata</i> ✓	<i>Anastrophyllum minutum</i>	<i>Racomitrium ellipticum</i>
<i>Radula aquilegia</i>	<i>Hygrobiella laxifolia</i>	<i>Tetradontium brownianum</i>
<i>Saccogyna viticulosa</i> ✓	<i>Lophocolea fragrans</i>	<i>Zygodon conoideus</i>
	<i>Metzgeria leptoneura</i>	<i>Ulota drummondii</i>
Sub-Atlantic species of liverwort	Atlantic species of Moss	Western British species of Moss
<i>Anastrepta orcadensis</i> ✓	<i>Fissidens celticus</i>	<i>Dicranodontium denudatum</i> ✓
<i>Calypogeia arguta</i>	<i>Isothecium holtii</i>	<i>Grimmia hartmanii</i>
<i>Douinia ovata</i>	<i>Dicranum scottianum</i>	<i>Hylocomiastrum umbratum</i> ✓
<i>Lejeunea patens</i> ✓	<i>Rhabdoweisia crenulata</i> ✓	<i>Hypnum callichroum</i> ✓
<i>Metzgeria temperata</i>		<i>Sphagnum quinquefarium</i> ✓
<i>Microlejeunea ulicina</i>		<i>Thuidium delicatulum</i>
<i>Odontoschisma sphagni</i>		<i>Trichostomum tenuirostre</i>
<i>Plagiochila spinulosa</i> ✓		<i>Ulota hutchinsiae</i>
<i>Porella arboris-vitae</i>		
<i>Scapania compacta</i>		Oceanic species of moss
<i>Scapania gracilis</i> ✓		<i>Fissidens curnovii</i> ✓

Collated by F.Evans 4 -2-08 from SSSI feature sheets and files for Meirionnydd oakwoods SAC with same SAC feature but as a primary feature. Ed. A.Seddon. Blue type additional oceanic (Ben Averis) species Coed Aber Arthro report. Other site data specifically for 'listed Oceanic species' not available.

Table 3. Typical species of the woodland SAC feature:

Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.

Here at the moorland edge and up to altitudes of over 380m.

Tree and shrub layer	Field and ground layer
<p><i>Betula pubescens</i>, <i>Sorbus aucuparia</i>, <i>Quercus petraea</i>, <i>Corylus avellana</i> and other locally native species including <i>Salix aurita</i>, <i>Salix cinerea</i> and <i>Crataegus monogyna</i>.</p>	<p><i>Agrostis capillaris</i>, <i>Deschampsia flexuosa</i>, ferns including <i>Dryopteris</i> sps , <i>Dryopteris oreades</i>, <i>Blechnum spicant</i> , <i>Oreopteris limbosperma</i>.</p> <p><i>Calluna vulgaris</i>, <i>Vaccinium myrtillus</i>, <i>Galium saxatile</i> <i>Molinia caerulea</i> (boggy areas), <i>Oxalis acetocella</i> and very locally <i>Endymion non-scripta</i>.</p> <p><i>Pteridium aquilinum</i>, <i>Luzula sylvatica</i>, and/or mosses and liverworts sometimes carpeting the woodland floor and boulders including <i>Thuidium tamarisinum</i>, <i>Polytrichum formosum</i>, <i>Rhytidiadelphus loreus</i>. <i>Dicranum majus</i>, <i>Hylocomium splendens</i>, <i>Pleurozium schreberi</i>, <i>Plagiothecium undulatum</i>, <i>Isothecium myosuroides</i>, <i>Mylia taylorii</i> and <i>Scapania gracilis</i>.</p>

Performance indicators for Woodland SAC Feature

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: woodland</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of broad-leaved woodland and associated habitats	Lower limit is based on current extent of SAC woodland. Management should aim to encourage the development of a more natural, gradual transition from moorland to woodland, with a scattering of trees in some heath areas and in the bracken areas. Target areas are likely to include bracken-covered areas including ffridd and steep, rocky slopes and crags, where there is natural tree regeneration already.	<i>Lower limit:</i> 67 ha as mapped with an additional c 13ha within the SAC. <i>Upper limit:</i> Some increases in woodland habitat would be desirable, provided that this is generally at the expense of acid grassland and bracken rather than priority habitats or species.
A2. Location of woodland		
A3. Tree canopy cover	The tree canopy percentage cover within (as defined on Map) should be about 85% of the woodland area. If there is a natural catastrophic event assessment should be made to see if follow up management is required.	<i>Upper Limit:</i> Tree canopy 90% of woodland area. <i>Lower Limit:</i> Tree canopy may be less than this if this is of benefit to defined interest such as lichens. It may be less after a natural catastrophic event.
A4. Canopy and shrub layer	The canopy and shrub layer comprises locally native species.	Some non-native species may be tolerated where they support important species such as lichens and are not highly invasive. Phased removal of non-natives is often appropriate with long-term management to control regrowth/reinvasion.
A5. Native tree	Natural regeneration of locally native	<i>Upper Limit:</i> none set.

and shrub regeneration	trees which will often be less in the upland situation than lowland. Acceptable regeneration may vary considerably compartment to compartment depending on ecological assessment.	<i>Lower Limit:</i> regeneration visible with limits set on a unit basis.
A6. Ground layer	The ground layer should be characteristic of the vegetation sub-community and at a height where there is there is the most plant diversity for which that location is special or has been designated. These woodlands have a varied structure from gentle ffridd slopes to cliffs, massive rocks and moss covered boulder- strewn floors. Typical lower plants including oceanic species (refer to table in the Annex for an indicative list) should continue to be abundant and/or maintained.	The ground layer in these upland woods tends to comprise lower plants and ferns and to be less productive in terms of bramble etc. compared with lowland NVC W11. Woodlands should not be overgrown and as a general guide difficult to walk through because of rank vegetation.
A7. Uncommon mosses, liverworts, lichens and slime moulds	Current populations of uncommon mosses, liverworts, lichens and ferns will flourish and expand where possible. Nationally scarce <i>Jamesoniella autumnalis</i> (liverwort) and <i>Plagiothecium laetum</i> (moss) are recorded here.	<i>Upper Limit:</i> none set <i>Lower Limit:</i> The current abundance and distribution should be maintained or preferably increased.
A8. Mature / Veteran trees	There will be a scattering of mature and eventually veteran trees where they are not likely to be affected by health and safety considerations of paths, tracks and power lines.	<i>Upper Limit:</i> none set <i>Lower Limit:</i> This is set at a level appropriate to each unit, which is usually above the current number. Achievement of this limit is dependant on time passing and lack of disturbance/destruction of mature and maturing trees so they may be allowed to grow into veterans.
A9. Dead wood	Dead wood which is important for its associated plants and animals supporting specialised mosses, liverworts, lichens and invertebrates should be present. Tree surgery and timber movement should only usually happen for public or stock safety reasons. Away from public access, standing dead trees will be allowed to decay and fall naturally	<i>Upper Limit:</i> Not required <i>Lower Limit:</i> Dead wood will be present and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare).

<i>Performance indicators for factors affecting the feature: woodland</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Grazing	A light level of grazing helps to maintain the moss, liverwort and lichen interest of the woods. Ideally the grazing level should be low enough to allow some natural regeneration. Too heavy grazing can result in no regeneration, excessive trampling, poaching and loss or disturbance of the ground flora and soils. Suitable stocking rates will need to be assessed relating to the current condition of the woodland.	Favourable management is often light summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year.
F2. Non-native species	These include species such as beech, larch, spruce, pine and other conifers, sycamore, (rhododendron, Japanese knotweed, Himalayan balsam, and sweet chestnut). Rhododendron is not recorded from this site or known to occur nearby but it is important to maintain vigilance. This non-native shrub should not be tolerated within the SSSI as it often grows to the exclusion of all else, forming a dense canopy, which casts a dense shade.	Non-native species should be absent unless individual trees are known to be important for maintaining humidity or for defined wildlife interest and there are mechanisms in place to ensure no seeding or encroachment. Coed Gordderw for example has non-native Scots pine which supports lichen interest. Exceptionally individual trees may be retained for landscape reasons provided there is no adverse impact on nature conservation.
F3. Humidity	The assemblage of bryophytes includes many that are dependent upon the maintenance of high levels of humidity. It is the existence of a full canopy cover of trees that maximises the area influenced by the river's humidity. The same tree canopy also filters out the direct sunlight, which some species cannot tolerate. A diverse age structure amongst the trees is therefore essential to the continued recruitment of trees into the canopy following wind blow or death in mature trees above the river.	Tree felling leading to large gaps in the gorge canopy should not take place and there should be no significant reduction in the river's flow rate due to abstraction or flow diversion.
F4. Hydro-electric power	Hydroelectric power schemes can reduce humidity and include other structures such as pipes, which will may adversely affect the woodland habitat.	Plan or project should be assessed.
F5. Woodland management	This may include tree surgery and scrub clearance, can be beneficial if carried out appropriately. It could however cause damage if for example important trees are felled or if mosses, other plants and/or wildlife are damaged or disturbed as a result.	Plan or project should be assessed.
F6. Adventure gorge walking & white water canoeing rafting	Adventure gorge walking and other such activities are becoming more common in North Wales. Many of the scarce moss and liverwort species grow on rocks and crags in the most humid areas within the gorge, often on accessible ground. They may be at risk of physical damage from	Plan or project should be assessed. Mitigation must be enforceable.

	increased access by people engaging in these pastimes.	
F7. Civil engineering operations	Civil engineering operations including bridge, track and road construction can have an adverse impact on the woodland habitat.	Plan or project should be assessed.

4.5 Conservation Objective for SPA Feature : Hen harrier *Circus cyaneus* (EU Code: A082)

Vision for feature 5

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

1. The size of the population is at least 8 breeding pairs (SPA form 2003 10-12 pairs) and preferably increasing. (2007 –11 pairs)
2. Hen Harrier nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats.
3. Hen Harrier breeding success is at least one young fledged per nest.
4. There is sufficient nesting and roosting tall heather habitat to support the population in the long-term.
5. There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low.
6. All factors affecting the achievement of these conditions are under control

Performance indicators for hen harrier feature

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: hen harrier		
Attribute	Attribute rationale and other comments	Specified limits
A1. Breeding population size	CSM considers a 25% decline in breeding pairs from the 10-12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition this means <u>it could be 8 pairs.</u>	Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. (2007 –11 pairs) <i>Upper limit:</i> n/a <i>Lower limit:</i> 8 pairs
A2. Hen harrier breeding distribution	It is important for the range within the site to be maintained.	
A3. Breeding success	Successful nests are those which fledge at least 1 young per season. Nests can fail for a number of reasons including infertile eggs and chick starvation.	<i>Lower limit:</i> An average of 1 fledged per territorial pair.
A4. Extent of available nesting habitat	Maintain suitable areas of tall mature-rank heather across the site. Hen harriers often, but not exclusively,	<i>Lower limit:</i> extent at notification. Ground layer sward height <i>Upper limit:</i> 100cm <i>Lower limit:</i> Maintain patches of

	nest on flat patches on south facing slopes in sheltered locations.	heather at least 40cm deep on flat or gently sloping ground.
A5. Extent of available hunting habitat and prey items	See above.	<i>Upper limit:</i> None set <i>Lower limit:</i> 1:3 ratio of nesting to foraging habitat in mosaic throughout breeding area.
Performance indicators for factors affecting the feature: hen harrier		
Factor	Factor rationale and other comments	Operational Limits
F1. Burning and mowing or topping vegetation	Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1 st October to 15 th April – Uplands). Burning can also adversely affect hunting habitat.	Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate and care taken not to provide inadvertently good fox routes to nests.
F2. Grazing	This factor is highly significant in management of the nesting, roosting and hunting habitat.	As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of hen harrier and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure .
F3. Persecution	No persecution of hen harriers which are listed W&C Act schedule 1 species should take place.	Enforcement as and when appropriate.
F4 Predation	Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to hen harrier, which are ground nesting birds. Records show that fox predation can be very significant in some years.	Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place.
F5. Disease	Release of captive bred game birds adjacent to site may introduce diseases such as. Avian Cholera/ Bird Flu	Assessment of plans and projects if consulted on land adjacent and education/information from initiatives, projects and newsletters.
F6. Weather	Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks.	It is important to be mindful of this factor when interpreting data and trends.
F7. Development	Upland sites are frequently targeted for windfarm development which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.	Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent.
F8. Disturbance	Disturbance by people stopping close by nests and more directly by dogs and vehicles can significantly affect breeding	Disturbance during the breeding season (guide: 1st April – 15 th August) from about 500m distance

	success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming	can have a major impact. This factor is not measured at present, as the only way would be to have camera on every territory and nest. Numbers of successful pairs is an indication as are trends including numbers not increasing when the habitat is not at carrying capacity.
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4.6 Conservation Objective for Feature : Merlin *Falco columbarius* (EU Code: A098)

Vision for feature 6

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

1. The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9% GB) and preferably increasing.
2. Merlin nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats.
3. Merlin breeding success is at least one young fledged per nest when sample monitoring is carried out.
4. There is sufficient nesting and roosting tall heather, individual trees often with crows' nests and forestry edge habitat to support the population in the long-term.
5. There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds (commonly meadow pipit and skylark) and large insects to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low.
6. All factors affecting the achievement of these conditions are under control

Performance indicators for Feature: Merlin

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: merlin</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Breeding population size	CSM considers a 25% decline in breeding pairs from the 9-12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition this means <u>it could be 7 pairs.</u>	Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. <i>Upper limit:</i> n/a <i>Lower limit:</i> 7 pairs
A2. Merlin breeding distribution	It is important for the range within the site to be maintained.	
A3. Breeding success	Successful nests are those, which fledge at least 1 young per season.	<i>Lower limit:</i> 1 fledged per territorial pair when samples are monitored.
A4. Extent of available nesting habitat	Areas of tall mature-rank heather usually on the sides of small valleys, steep banks or on rocky terraced slopes. Individual	<i>Upper limit:</i> None set <i>Lower limit:</i> extent at notification. Ground layer sward height

	broad leaf trees and conifers around the forestry edge. Tree nesting merlin (can be about 40% of pairs within this SPA) have been found to have greater success than ground nesting birds (Newton <i>et al</i> , 1981, 1986).	<i>Upper limit:</i> 70cm <i>Lower limit:</i> 30cm with individual trees (with old crows nests particularly traditional sites).
A5. Extent of available hunting habitat and prey items	See above.	<i>Upper limit:</i> None set <i>Lower limit:</i> 1:3 ratio of nesting to foraging habitat in mosaic throughout breeding area.

Performance indicators for factors affecting the feature: merlin		
Factor	Factor rationale and other comments	Operational Limits
F1. Burning and mowing or topping vegetation	Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1 st October to 15 th April – Uplands). Burning can also adversely affect hunting habitat.	Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate.
F2. Grazing	This factor is significant in management of the hunting (and nesting) habitat.	As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of merlin and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure.
F3. Persecution	No persecution of merlin which are listed W&C Act schedule 1 species should take place.	Enforcement as and when appropriate.
F4 Predation	Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to merlin, which are often ground nesting birds.	Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place.
F6. Weather	Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks.	It is important to be mindful of this factor when interpreting data and trends.
F7. Development	Upland sites are frequently targeted for windfarm development which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.	Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent.
F8. Disturbance	Disturbance by people stopping close by nests and more directly by dogs and	Disturbance during the breeding season (guide: 1st April – 15 th

	<p>vehicles can affect breeding success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming</p>	<p>August) from about 500m distance can have a major impact. This factor is not measured at present, as the only way would be to have camera on every territory and nest. If the trend is for numbers of successful pairs to be stable or increasing it is likely that disturbance is low. Conversely low numbers of successful pairs (as indicated by the carrying capacity of the habitat) and downward trends may indicate disturbance. This factor should be investigated if there are no other known factors responsible.</p>
<p>F9. Forestry management</p>	<p>Forest edge management and forest redesign are likely to be important to merlin as possibly increasing numbers are tree nesting within and adjacent to the SPA.</p>	<p>Retain traditional nest site trees and likely potential nesting trees (often with crows' nests) both broadleaf and conifer within the forestry edge.</p>

4.7 Conservation Objective for SPA Feature : Peregrine *Falco peregrinus* (EU Code: A103)

Vision for feature 7: Peregrine

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

1. The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9% GB) and preferably increasing.
2. Peregrine nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate nest sites.
3. Peregrine breeding success is at least one young fledged per nest when sample population monitoring is carried out.
4. There are sufficient cliff and crag with ledges suitable for nesting usually known traditional nest sites to support the population in the long-term.
5. There is a sufficient hunting habitat and prey. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if peregrine productivity is low.
6. All factors affecting the achievement of these conditions are under control

Performance indicators for SPA Feature : Peregrine

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: peregrine</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Breeding population size	CSM considers a 25% decline in breeding pairs from the 12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition -this means it could be 9 pairs. There are c.12 known traditional peregrine nest sites within the SPA, which are not all occupied in any one year.	Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. <i>Upper limit:</i> n/a <i>Lower limit:</i> 12 pairs
A2. Peregrine breeding distribution	It is important for the range within the site to be maintained.	Map
A3. Breeding success	Successful nests are those, which fledge at least 1 young per season.	<i>Lower limit:</i> 1 fledged per territorial pair when samples are monitored.
A4. Extent of available nest sites	Peregrines breed mainly on undisturbed ledges of cliffs, crags and quarries, both within and adjacent to the SPA. Ledges suitable for nesting are usually already recorded and known as traditional nest sites.	<i>Lower limit:</i> 12 within SPA boundary
A5. Extent of available hunting habitat and prey items	See above. This attribute is very significant but cannot be easily measured so declines in other attributes may indicate a need for detailed study and research of prey items.	This species will hunt across vast areas and is not in any way restricted to the SPA habitats so meaningful limits cannot be set.

<i>Performance indicators for factors affecting the feature: peregrine</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Burning vegetation	Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1 st October to 15 th April – Uplands). Burning can also adversely affect hunting habitat.	Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise.
F2. Grazing	This factor is significant in management of the hunting (and nesting) habitat.	As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of merlin and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure.
F3. Persecution	No persecution of merlin, which is listed W&C Act schedule 1 species, should take place.	Enforcement as and when appropriate.
F4 Predation	Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to merlin, which are often ground nesting birds.	Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place.
F5. Weather	Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks.	It is important to be mindful of this factor when interpreting data and trends.
F6. Development	Upland sites are frequently targeted for windfarm development, which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.	Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent.
F7. Disturbance	Disturbance by people stopping close by nests and more directly by dogs and vehicles can affect breeding success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming	Disturbance during the breeding season (guide: 1st April – 15 th August) from about 500m distance can have a major impact. This factor is not measured at present, as the only way would be to have camera on every territory and nest. If the trend is for numbers of successful pairs to be stable or increasing it is likely that disturbance is low. Conversely low numbers of successful pairs (as indicated by the carrying capacity of the habitat) and downward trends may indicate disturbance. This factor should be investigated if there

		are no other known factors responsible.
F8. Disease	Release of captive bred game birds adjacent to site may introduce diseases such as. Avian Cholera/ Bird Flu	Assessment of plans and projects if consulted on land adjacent and education/information from initiatives, projects and newsletters.

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 : Blanket bog (EU: 7130)

Conservation Status of SAC Feature: Blanket Bog

Gray, David D. (2005). A condition assessment of European Dry Heath, Northern Atlantic wet heath and Blanket Bog habitat at the Migneint-Arenig-Dduallt SAC.

Condition: Unfavourable (2008)

This is based on the Gray (2005) reference which states” “31% (621ha) of the total blanket bog sampled (c.2003 ha of a total of c.8100 ha) was found to be in favourable condition” (Pg 81) and CCW Regional knowledge of the site 2000-2008. The main reasons for it being assessed as unfavourable are:- the extent of NVC M20 (Regional data c.1700 ha), the unfavourable structure of the blanket bog with functioning drains and visible peat erosion and the presence of trees particularly on previously afforested land.

Status: Unfavourable (2008)

This is based on the CCW Regional knowledge of the site 2000-2008.

The reasons for this unfavourable assessment are: - the lack of a blanket bog restoration scheme other than the LIFE project in small FC areas, the fact that the grazing is not appropriate across the site or controlled on some units comprising a significant area, burning is not under control as evidenced by the 10 square km fire of 2003, conifer/tree growth is not under control and factors causing peat erosion (over grazing and recreational access) are not under control.

Management Requirements of Blanket Bog

The management requirements of Blanket Bog are discussed under factors in section 4.1 (pp16-18). The following is a brief summary of the key management requirements of, grazing, drainage, burning and tree encroachment, which need to be tackled, to restore the feature to favourable condition.

Grazing

Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year. (0.33 ewes). Ponies or cattle have advantages over sheep due to their tendency to graze coarser grass and rush vegetation without adversely affecting heather/ericaceous cover. Sheep will graze heather intensively in the late summer through to the winter if they are able. As sheep are currently overwhelmingly the favoured agricultural livestock it is difficult to get appropriate grazing regimes with cattle or ponies other than when opportunities arise where landowners are willing or a public body such as FC own land. Sheep grazing can work well when they are stocked at low density and away wintered.

1. Review grazing regimes on a unit basis and identify those areas where grazing is not appropriate for restoring/maintaining blanket bog in good condition and action restoration grazing management where possible.

Drainage

Drainage is a highly significant factor, which adversely affects blanket bog but is difficult to manage. There is little doubt that artificial drainage including moor grips has restricted the extent of blanket bog and affected the quality. The best quality bog, (refer to 4.2 Table 2 page 14) such as areas mapped as NVC M18, is very waterlogged with bog pools and the heather growth is naturally stunted forming a low mattress of layering stems. Where drainage takes effect the heather can be taller and more leggy and more typically is NVC M19. When the effect of drainage is severe, as can be seen by forestry drains, blanket bog is converted to wet heath having lost the hare's tail cotton grass and hence can be further degraded.

2. Review and continue the mapping of current drainage ditches and classify according to need to block or whether likely to infill naturally over time and identify those areas where artificial drainage is obviously adversely effecting blanket bog and action restoration ditch blocking management where possible.
3. Continue to liase with LIFE project staff and learn from and influence actions resulting from this project directly on FC land but also through the training and interpretation elements across the whole SAC (eg showing farmers ditch blocking
4. Liase with and encourage the development of the National Trust initiative for ditch blocking through agreement with their tenants initially on a pilot area in unit (compartment 82b-Llyn Serw).

Burning

5. Continue to pursue policy of no burning through the SSSI consenting process (suggesting alternative measures if possible such as limited cutting and grazing), maintain vigilance, record and map fires when they occur and pursue enforcements where practical to do so.

Tree encroachment/growth

6. Continue to encourage the total removal of trees from blanket bog through the consenting process and input into funded projects. Resolve perceived conflicts with black grouse management where they occur (refer to page 10).

5.2 Conservation Status and Management Requirements of Features : European dry heath (EU: 4030) and Northern Atlantic wet heaths with *Erica tetralix* SAC features (EU: 4010)

Conservation Status of SAC Features: Dry heath and wet heath

Gray, David D. (2005). A condition assessment of European Dry Heath, Northern Atlantic wet heath and Blanket Bog habitat at the Migneint-Arenig-Ddualt SAC .

Condition dry heath: Unfavourable (2005)

The Gray (2005) assessment was based on a sample of plots and survey covering some 15% of the actual SAC blanket bog area and extrapolates from this to say that just over half (337ha or 58%) of the dry heath in his survey area was considered to be in favourable condition". (Pg 79). Reasons given in Gray (2005) for unfavourable condition were, edge effects as this habitat grades into another with increased grazing possibly the reason, sometimes because of bracken and sometimes for being very grassy through presumed overgrazing. CCW Regional knowledge of the SAC 2000-2008:- bracken not generally an issue on this SAC except where burnt (eg Cwm Hesgyn) and where woodland used to occur in the recent past which is often a good indication of where this habitat can be restored. Conifers are an issue in localised but extensive areas.

Status dry heath: Unfavourable (2008)

This is based on Gray (2005) and the CCW Regional knowledge of the SAC 2000-2008. The reasons or factors not within limits/under control for this unfavourable assessment are: - inappropriate grazing and burning and the presence of conifers.

Condition wet heath : Unfavourable (2005)

With regard to the wet heath, Gray (2005) surveyed 40 Ha of a SAC total of c.400 ha ie 10% of the total SAC area and of this considered only 0.34 Ha (0.85%) to be in favourable condition (Pg 83). Reasons given in Gray (2005) for unfavourable condition appear to be that the *Molinia* cover is more than 50%, the ericaceous component is suppressed by over grazing and there is leggy heather present over 60cms. He also makes the comment that much of the wet heath surveyed is on deep peat and is degraded blanket bog not 'typical wet heath'. See the conservation objective where this is taken into account (page 18). From CCW Regional knowledge of the SAC 2000-2008 and experience of wet heath we make the following comments:-. In the NVC (Rodwell 1991) for NVC M15, the component community for this SAC feature, *Molinia* is a constant with a frequency of V and a cover of 1-9 and 4-8 in M15a the characteristic sub-community found here. The NVC is based on 69 M15a samples and 282 total. The attribute set at 50% cover for *Molinia* in Gray (2005) appears to be somewhat strange and better set if at all at over 75% cover which is at a domin of 9 and outside the 'usual' range based on the NVC. If the constants are present and frequent and the stand is generally less than 30cms height the wet heath is likely to be in good condition (refer to page 18).

Status wet heath: Unfavourable (2005)

The reasons or factors not within limits/under control for this unfavourable assessment are: - From Gray (2005), grazing and from CCW Regional knowledge burning and drainage as these tend to result in stands being impoverished with *Molinia* tending to become tussocky with a cover over 75%.

Management requirements of Heath Features:

Burning

Burning has been used as cheap and easy way of managing heath land for centuries; to control coarse and sometimes impenetrable (to man, dog and stock) vegetation and to provide new vegetation growth for livestock or for game birds management. Indeed many assume that heath land and grouse moorland management are one and the same thing. Such areas have been managed by man over centuries to produce an unnatural dominance of heather and the rather species-poor (frequently burnt) vegetation that we have all become accustomed to. Heather is a native plant, which naturally regenerates by collapsing outwards (when mature) and regenerating from the centre. Heather in damp habitats continuously layers to form a 'mattress' of stems. Heather does not have to be burnt to survive and all heaths do not have to be managed as grouse moors, with a patchwork of different age

structure, to benefit game birds. It may appear that heath regenerates well after fire but in truth it is the constant species particularly shrubs such as *Calluna*, *Vaccinium* and *Ulex* which thrive on burning, if not overgrazed. Uncommon species including bog mosses and liverworts, and communities like NVC H 21, only survive in tiny areas, which have escaped burning for a long period.

1. Continue to pursue policy of caution regarding burning through the SSSI consenting process and ensure there is a clear written objective for the burning -suggesting alternative measures if possible such as cutting and grazing. Limit to appropriate areas of dry heath (usually NVC H12), at a small scale, well-controlled and following good practise and codes. Hence burning of some stands of dry heath may be consented on a case-by-case basis. Wet heath should not be burnt. Heath on steep rocky slopes with thin soils or heath with abundant lower plants (NVC H 21) or uncommon species such as lesser twayblade orchids (see table 2) should not be burnt. Montane heath should not be burnt

Conifers

Forestry plantations border parts of the site and some areas of (usually failed) conifers with heath are included within the SAC boundary. There is also seeding from plantation areas and previously felled areas where conifers have been left, onto adjacent heath.

2. Continue to encourage conifer removal from heath through the SSSI consenting process, projects and forest re-design.

Grazing and stock management

Grazing is required to maintain heaths in favourable condition but heathland has become degraded through a combination of over grazing and burning. In some cases restoration may require the complete removal of stock for a limited time. Traditional shepherding may also be required to ensure that the grazing intensity is more evenly spread across the area. Montane heath currently covers only 0.5 ha of the site and we would aim to maintain or increase this area although it will be constrained somewhat by ecological requirements of exposure and altitude.

3. Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes) for dry heath, and 0.3LSU/ha/yr (cattle/ponies) for wet heath with frequent/dominant purple moor grass. Measures should be initiated to establish appropriate grazing where these features are unfavourable because of current or past grazing regimes.

5.3 Conservation Status and Management Requirements of Feature : Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* SAC feature (EU : 3130) and Natural dystrophic lakes and ponds SAC feature, (EU: 3160)

Conservation Status of clear-water and peaty lake features

Reference: 'Site condition assessments of Welsh SAC and SSSI standing water features Reports Name(s) Burgess, A. ,Goldsmith, B., Hatton-Ellis, T. Series CCW Science Report (705) Publication Bangor : Countryside Council for Wales (CCW), 2006'

Condition clear-water lakes: Llyn y Garn and Llyn Hesgyn were both **favourable**. Hiraethlyn was **unfavourable** due to a heavy sediment load from grazing pressure.

Status clear-water lakes:

From reference per.com (HL/FE) **Unfavourable Recovering** (failed on 'overgrazing!')

Dystrophic ponds:

Condition peaty lakes: Llyn Conglog-Mawr is probably **favourable**. Llyn Tryweryn and Llyn y Dywarchen were both **unfavourable** due to acidification. Llyn Tryweryn also shows evidence of nutrient inputs.

Status peaty lakes:

From reference per.com (HL/FE) **Unfavourable : Unclassified** (Failed on 'water quality' and 'forestry')

Management Requirements of lake features (modified from Burgess et al. 2006)

Lake	Monitoring / data needs/comments	Site management recommendations
Llyn Conglog-Mawr	Regular macrophyte / water quality surveys, including collection of-further TP and ANC data (seasonal/mean). Plant macrofossil and aquatic pollen analyses to examine former flora. Monitor populations of <i>N. gracilis</i> . This lake is strongly peat influenced and is best considered dystrophic, though it is relatively species rich.	Maintain catchment and assess plans and projects.
Llyn y Dywarchen	Regular macrophyte / water quality surveys, including collection of-further TP and ANC data (seasonal/mean). Plant macrofossil and aquatic pollen analyses to examine former flora. Further survey of other potential dystrophic lakes on Migneint is needed. Investigate whether present-day absence of macrophytes is natural.	Maintain catchment and assess plans and projects.
Llyn y Garn	Regular macrophyte / water quality surveys, including collection of-further TP and ANC data (seasonal/mean). Monitor populations of <i>L. natans</i> . Maintain conditions favourable to <i>L. natans</i> .	Maintain catchment and assess plans and projects.

Llyn Hesgyn	Further TP and alkalinity data (seasonal/mean). Regular macrophyte / water quality surveys.	Maintain catchment and assess plans and projects.
Llyn Hiraethlyn	Regular macrophyte / water quality surveys, including collection of-further TP and ANC data (seasonal/mean). Monitor populations of <i>L. natans</i> . Monitor and manage grazing pressure.	Maintain and ideally restore catchment. Only the land to the east of the lake however lies within the SAC. Most of the immediate catchment is improved/modified agricultural grassland. Assess plans and projects.
Llyn Tryweryn	Regular macrophyte / water quality surveys, further TP and alkalinity data (seasonal/mean). Monitor labile aluminium concentrations. Investigate possible reasons for atypical dystrophic macrophyte flora. Investigate effects of forestry on lake ecosystem.	Maintain catchment and assess plans and projects. Ideally there should be managed felling of coniferous trees in the catchment adjacent which are all outside the SAC – replace with natural land cover.

Pollution and climatic change

There are a number of natural or human-induced processes taking place which are changing the environmental/ecological conditions and causing some concern in relation to Migneint-Arenig-Dduallt and other upland areas in Britain. These include acidification of lakes and soils, due to atmospheric pollution; nutrient enrichment (especially increased nitrogen and phosphorus) in lakes and soils through a combination of atmospheric pollution, excessive sheep-dunging/urination and other inputs from diffuse sources; and the possible effects of climate change on fragile upland ecosystems. Mosses and liverworts are particularly vulnerable to pollution from atmospheric sources. Stock reductions should help reduce the nitrogen input, but it will obviously also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution. Further monitoring and research studies in the uplands are needed to determine precise processes and effects before it is known what restoration management might be possible.

5.4 Conservation Status and Management Requirements of Feature 4: Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (EU Habitat Code: 91A0)

Conservation Status of oak woods

Condition: Unfavourable (2007)

Status: Unfavourable (2008)

Reference: Bigham, P. & Roberts, R (2007). Condition assessment of Annex 1 woodland habitats at four SACs in north and mid Wales - CCW Environmental Monitoring Report no. 38, explains that although all compartments were generally favourable for the attributes selected the lack of mature-veteran trees (4 out of 6 survey compartments) and 'sufficient' dead wood (6/6compartments) are the reasons for the "unfavourable condition" rating as well as Coed Gordderw failing the tree composition attribute by having abundant spruce and larch.

Grazing pressure and lack of regeneration were also mentioned as of concern and are reasons for the unfavourable conservation status.

Management Requirements of oak woods

Mature-veteran trees

This lack of mature-veteran trees results from past management and should resolve itself over time provided no plans or projects are approved which indirectly result in felling mature trees such as power lines, development and recreational access.

Dead wood

This lack of dead wood including standing dead wood results from past management and should resolve itself over time provided no plans or projects are approved which result in the removal of significant amounts of dead wood including development and recreational access.

Grazing

1. Controlled light grazing at no more than 0.05LSU/Ha over the summer months; assuming that sufficient regeneration of young saplings is present.

5.5 Conservation Status and Management Requirements of SPA Feature :
Hen harrier *Circus cyaneus* (EU Code: A082)

Conservation Status of hen harrier

Table: The number of breeding female hen harriers recorded on the Migneint-Arenig-Dduallt SPA from 1994 to 2007.

Year	Number of breeding female hen harrier - M-A-Dd SPA	Year	Number of breeding female hen harrier- M-A-Dd SPA
1994	8	2001	2-3**
1995	8	2002	11-12
1996	8	2003	13
1997	13	2004	18
1998	10	2005	12
1999	9	2006	10
2000	3-5*	2007	11

* Survey affected by Foot and Mouth disease restrictions

Condition: Favourable.

SPA monitoring 2002,2003 and 2004

Territorial pairs = 11-12, 13 and 18 respectively.

Monitoring of Migneint-Arenig-Dduallt SPA features undertaken in consecutive years from 2002-2004 (inclusive) revealed that hen harrier achieved favourable status during all 3 years over the 6 yearly reporting cycle. Causes of breeding failure were recorded as nest predation, poor weather or unavailability of food (circumstantial evidence) or nest abandonment due to unidentified reasons.

Status: Favourable

Factors are generally considered to be under control but we should not be complacent as numbers of pairs are not increasing and some key factors are not monitored.

Management Requirements of Hen harrier

Persecution

There have been recorded incidents of persecution including young shot in a nest and in 1987 chicks were taken from a nest, as well as adult birds having been shot.

1. There must continue to be vigilance during the breeding season, enforcement action if appropriate, monitoring of the attributes and interpretation of trends.

Burning

Uncontrolled fires have been a problem within Migneint-Arenig-Dduallt SPA in the past, including fires where the cause is unknown and where planned fires have become uncontrollable. There was a particularly severe fire in March 2003 when 872 ha were burnt, which destroyed a traditional hen harrier nest site.

2. Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate.

Grazing

Overgrazing and undergrazing including not having sufficient cattle/pony grazing regimes may be an issue in terms of optimal foraging and prey availability.

3. Establish precisely where these birds are hunting during breeding season so management can be targeted.

Further survey/research outside the remit of this plan

More information is required on:

- Wintering/non-breeding areas, both roost and winter-feeding locations need to be further identified and appropriate management.

5.6 Conservation Status and Management Requirements of SPA Feature :
Merlin Falco columbarius (EU Code: A098)

Conservation Status of Merlin**Table: The number of merlin territories recorded on the Migneint-Arenig-Dduallt SPA from 1994-2007.**

Year	Number of merlin territories -M-A-Dd SPA	Year	Number of merlin territories -M-A-Dd SPA
1994	8	2001	3**
1995	6	2002	6-8
1996	7	2003	8
1997	4-5	2004	7
1998	8-9	2005	4
1999	7	2006	6
2000	3*	2007	4***

* Data missing

** Survey affected by Foot and Mouth disease restrictions

***Not full survey

Condition: Favourable.

SPA monitoring 2002,2003 and 2004

Territorial pairs = 6-8, 8 and 7 respectively.

Monitoring of Migneint-Arenig-Dduallt SPA features undertaken in consecutive years from 2002-2004 (inclusive) revealed that merlin achieved favourable status (more than 7 pairs) during all 3 years over the 6 yearly reporting cycle.

Status: Favourable

Factors are generally considered to be under control but we should not be complacent as numbers of pairs are not increasing and some key factors are not monitored.

Management Requirements of MerlinBurning

Uncontrolled fires have been a problem on the Migneint-Arenig-Dduallt SPA in the past, including fires where the cause is unknown and where planned fires have become uncontrollable. There was a particularly severe fire in March 2003 when 872 ha were burnt, which destroyed or affected three traditional merlin nest sites.

1. Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate.

Grazing

Overgrazing and undergrazing including not having sufficient cattle/pony grazing regimes may be an issue in terms of optimal foraging and prey availability.

2. Establish precisely where these birds are hunting during breeding season so management can be targeted.

5.7 Conservation Status and Management Requirements of SPA Feature:
Peregrine *Falco peregrinus* (EU Code: A103)

Conservation Status of Peregrine

Table: The number of peregrine territories recorded in and adjacent (within two kilometres of the site boundary) to the Migneint-Arenig-Dduallt SPA from 1994-2007.

Year	Number of peregrine territories within M-A-Dd SPA and 2 km adjacent.	Year	Number of peregrine territories within M-A-Dd SPA and 2 km adjacent.
1994	7-8	2001	1*
1995	6-7	2002	8
1996	6	2003	4-5
1997	6	2004	6
1998	4-5	2005	10
1999	3	2006	7
2000	5	2007	6

* Survey affected by Foot and Mouth disease restrictions

Condition: Unfavourable

SPA monitoring 2002,2003 and 2004

Territorial pairs = 8, 4-5 and 6 respectively.

Monitoring of Migneint-Arenig-Dduallt SPA features undertaken in consecutive years from 2002-2004 (inclusive) revealed that peregrine achieved unfavourable status (less than 9 pairs) during all 3 years over the 6 yearly reporting cycle.

The quoted figure on the SPA form 2003 of 9-12 pairs (0.7-0.9% GB) may originally have been high and based on known traditional nest sites of which there are c.12 but these are not all occupied in any one year. A figure of less than 12 pairs however is likely to mean the site supports less than 1% GB.

Status: Unfavourable

Based on the SPA monitoring assessment of condition the status is also considered to be unfavourable for reasons unknown.

Management Requirements of Peregrine

Persecution

There have been several recorded instances within the SPA where chicks or eggs have been stolen; the last known case was in 1997. Four of the 12 known traditional nest sites have had recorded persecution events take place since 1991. With this past history and no prosecutions having taken place this would seem a possibly factor to at least partially account for the unfavourable condition and status. There is however no recent evidence.

1. There must continue to be vigilance during the breeding season, enforcement action if appropriate, monitoring of the attributes and interpretation of trends.

Disturbance

This may be a significant factor.

2. Survey and review activities and recreational use (including climbing) around traditional nest sites during the breeding season.

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	001191	Unit 1	This unit is believed to be in appropriate conservation management.	No
2	001205	Unit 2	A reduction to the current grazing level and the introduction of cattle/pony grazing would benefit the key habitats in this unit.	Yes
3	001206	Unit 3	This unit is believed to be in appropriate conservation management	No
4	001207	Unit 4	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
5	001208	Unit 5	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key features.	Yes
6	001209	Unit 6	Maintain current grazing levels, which have been prescribed to benefit/maintain wet heath. This unit is believed to be in appropriate conservation management.	No
7	001210	Unit 7	This unit is believed to be in appropriate conservation management.	No
8	001211	Unit 8	This unit is believed to be in appropriate conservation management.	No
9	001212	Unit 9	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
10	001213	Unit 10	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats (except NVC H12) and in turn may affect the hunting and breeding potential of the SPA key species.	Yes
11	001214	Unit 11	This unit is believed to be in appropriate conservation management.	No
12	001215	Unit 12	This unit would benefit from a reduction in grazing. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
13	001216	Unit 13	This unit would benefit from a reduction in grazing. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
14	001217	Unit 14	The current grazing regime in this unit is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
15	001218	Unit 15	This is a very large unit with numerous owner/occupiers. Some of these have entered into management agreements or agri-environment schemes, while others have not. Consequently in some areas the conservation management issues concerned with grazing are being addressed, while other areas in the unit require conservation management actions. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats. Illegal offroading is a problem in this unit, including both the use of 4x4 vehicles and motorcycles. This affects the SAC key habitats by disturbing livestock, which changes livestock distribution and consequently grazing pressure. It also directly affects the site by causing erosion and loss of vegetation along the routes used. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats (except NVC H12) and in turn may affect the hunting and breeding potential of the SPA key species.	Yes
16	001219	Unit 16		No
17	001220	Unit 17	This unit would benefit from a reduction in grazing and the introduction of cattle/pony grazing. drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
18	001221	Unit 18	The agreed Forest Design Plan shows that the conifer block will be removed from the unit, the clear-fell area will not be restocked. It will be left as open-ground, forming an extension to the adjacent area of blanket bog. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats. They may also affect the ability of the SAC key habitats to re-establish following the removal of the conifers.	Yes
19	001222	Unit 19	This unit is mainly comprised of acid grassland with some bracken and scree also present. The current management of this unit should continue with the aim of maintaining the short grassy vegetation which is a key foraging habitat for Ring ouzels.	No
20	001223	Unit 20	The current management of this unit should continue as it provides suitable foraging habitat for ring ouzel, wheatear and hunting hen harrier.	No
21	001224	Unit 21	This unit is believed to be in appropriate conservation management.	No
22	001225	Unit 22	This unit would benefit from a reduction to the current grazing level, and the introduction of cattle/pony grazing to increase sward diversity.	Yes
23	001226	Unit 23	This unit is believed to be in appropriate conservation management.	No
24	001227	Unit 24	This unit is believed to be in appropriate conservation management.	No
25	001228	Unit 25	This unit would benefit from a reduction in grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
26	001229	Unit 26	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
27	001230	Unit 27	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats,	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
28	001231	Unit 28	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
29	001232	Unit 29	This unit would benefit from a reduction in grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
30	001233	Unit 30	This unit would benefit from a reduction in grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
31	001234	Unit 31	The current grazing regime is appropriate to maintain/enhance the SAC key features. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
32	001235	Unit 32	This unit forms a key area for Golden Plover and has been recognised as an area where management conflicts will occur. The habitat requirements of this species demand the relatively heavy grazing of blanket bog, which after considering the plight of this bird, has been agreed. Therefore this unit is believed to be in appropriate conservation management.	No
33	001236	Unit 33	The current grazing regime is appropriate to maintain/enhance the SAC key habitats.	No
34	001237	Unit 34		Yes
35	001238	Unit 35	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
36	001239	Unit 36	The current grazing regime is appropriate to enhance/maintain the SAC key features. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
37	001240	Unit 37	The current grazing regime is appropriate to maintain/enhance SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
38	001241	Unit 38	This unit is believed to be in appropriate conservation management. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats (except NVC H12) and in turn may affect the hunting and breeding potential of the SPA key species.	Yes
39	001242	Unit 39	The current grazing regime is appropriate to maintain the SAC key habitats.	No
40	001243	Unit 40	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit which are likely to be having an adverse effect on the SAC key habitats.	Yes
41	001244	Unit 41	This unit is believed to be in appropriate conservation management. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats (except NVC H12) and in turn may affect the hunting and breeding potential of the SPA key species.	Yes
42	001245	Unit 42	This compartment is believed to be in appropriate conservation management.	No
43	001246	Unit 43	This unit has been heavily grazed and extensively drained, which has adversely affected the condition of the SAC key habitats. This unit is now under an "Agreed Management Plan" in order to restore the SAC key habitats.	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
44	001247	Unit 44	This unit has been recognised as a key area for Golden Plover. The habitat requirements of this species demand relatively heavy grazing to produce a short sward height. The current grazing regime should continue. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
45	001248	Unit 45	This unit would benefit from a reduction in grazing and the introduction of cattle/pony grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
47	001250	Unit 47	This unit would benefit from a reduction in grazing and the introduction of cattle/pony grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
49	001252	Unit 49	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
51	001254	Unit 51	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
52	001255	Unit 52	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats (except NVC H12) and in turn may affect the hunting and breeding potential of the SPA key species.	Yes
53	001256	Unit 53		No
54	001257	Unit 54	This unit would benefit from a reduction to the grazing level.	Yes
55	001258	Unit 55	This unit would benefit from conifer plantation clearance. Planting ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
56	001259	Unit 56	This unit would benefit from a reduction in grazing and the introduction in cattle/pony grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
57	001260	Unit 57	This unit is believed to be in appropriate conservation management.	No
58	001261	Unit 58	This unit is believed to be in appropriate conservation management.	No
59	001262	Unit 59	This unit would benefit from a reduction in grazing and the introduction of cattle/pony grazing.	Yes
60	001263	Unit 60	This unit is believed to be in appropriate conservation management. Drainage ditches are present in the unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
61	001264	Unit 61	This unit would benefit from a reduction in grazing, and the introduction of cattle/pony grazing. Drainage ditches are present and are likely to be having an adverse effect on the SAC key habitats.	Yes
62	001265	Unit 62	This unit would benefit from a reduction in grazing and the introduction of cattle/pony grazing. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC Key habitats.	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
63	001266	Unit 63	This unit would benefit from a reduction in grazing and the introduction of pony/cattle grazing. Drainage ditches are present and are likely to be having an adverse effect on the SAC key habitats.	Yes
64	001267	Unit 64	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in the unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
65	001268	Unit 65	The current grazing regime is appropriate to maintain/enhance the SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
66	001269	Unit 66	This unit is believed to be in appropriate conservation management.	No
67	001270	Unit 67	This unit would benefit from conifer clearance. Planting ditches are present in this unit and they are likely to have an adverse effect on any key habitat restoration.	Yes
69	001272	Unit 69	This unit is believed to be in appropriate conservation management.	No
70	001273	Unit 70	This unit is believed to be in appropriate conservation management.	No
71	001274	Unit 71	This unit is believed to be in appropriate conservation management.	No
72	001275	Unit 72	This unit is believed to be in appropriate conservation management.	No
73	001276	Unit 73	This unit would benefit from a slight reduction in grazing.	Yes
74	001277	Unit 74	This unit is believed to be in appropriate conservation management.	No
75	001278	Unit 75	This unit is believed to be in appropriate conservation management.	No
76	001279	Unit 76	The current grazing regime should be maintained. Drainage ditches are present and are likely to be having an adverse effect on the SAC key habitats.	Yes
77	001280	Unit 77	This unit is believed to be in appropriate conservation management.	No
78	001281	Unit 78	This unit is believed to be in appropriate conservation management. Old drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
79	001282	Unit 79	This unit is believed to be in appropriate conservation management. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats.	Yes
80	001283	Unit 80	This unit is believed to be in appropriate conservation management.	No
81	001284	Unit 81	This unit is believed to be in appropriate conservation management.	No
82	001285	Unit 82	This unit is believed to be in appropriate conservation management.	No
83	001286	Unit 83	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
84	001287	Unit 84	This unit is believed to be in appropriate conservation management.	No
85	001288	Unit 85	This unit would benefit from conifer removal. Planting ditches are present in this unit and are likely to have an adverse effect on the SAC key habitats.	Yes

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
86	001289	Unit 86	this unit is believed to be in appropriate conservation management. Old planting ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
87	001290	Unit 87	The current grazing regime should be maintained. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats. Ditches are present in this unit and are having an adverse effect on the SAC key habitats.	Yes
88	001291	Unit 88	This unit would benefit from a reduction in grazing, and the introduction of cattle/pony grazing.	Yes
89	001292	Unit 89	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
90	001293	Unit 90	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
91	001294	Unit 91	This unit would benefit if the conifers were clearfelled and the area not restocked. Planting ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
92	001295	Unit 92	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
93	001296	Unit 93	This unit is believed to be in appropriate conservation management. Areas within this unit were conifer plantation but have since been clearfelled so that natural SAC key habitats can regenerate. Planting ditches remain in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
94	001297	Unit 94	This unit is believed to be in appropriate conservation management.	No
95	001298	Unit 95	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
96	001299	Unit 96	This unit is believe to be in appropriate conservation management	No
97	001300	Unit 97	This unit would benefit from a reduction in grazing.	Yes
98	001301	Unit 98	This unit is believed to be in appropriate conservation management. Intentional or accidental fires are likely to have a negative impact on the SAC key habitats.	Yes
99	001302	Unit 99	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
100	001303	Unit 100	This unit is believed to be in appropriate conservation management.	No
101	001304	Unit 101	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
102	001305	Unit 102	This unit is believed to be in conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
103	001306	Unit 103	This unit is believed to be in appropriate conservation management.	No

Unit Number	CCW Database Number	Unit Name	Summary of Conservation Management Issues	Action needed?
104	001307	Unit 104	This unit would benefit from conifer plantation removal, and should not be restocked. Planting ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
105	001308	Unit 105	This unit is believed to be in appropriate conservation management. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
106	001309	Unit 106	This unit is believed to be in appropriate conservation management.	No
107	001310	Unit 107	This unit is believed to be in appropriate conservation management. Drainage ditches are present and are likely to be having an adverse effect on the SAC key habitats.	Yes
108	001311	Unit 108	This is a large unit area under Forestry Commission management. The Forest Design Plan shows that the majority of the unit will not be restocked and will be left as open space. Approximately 250 hectares within this unit is currently being managed by the LIFE Blanket Bog restoration project, which will result in the removal of scattered conifers, and 18ha of conifer plantation, ditch blocking and the introduction of pony grazing. Numerous planting ditches are found throughout the whole unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
109	001312	Unit 109	This unit is believed to be in appropriate conservation management.	No
110	001313	Unit 110	This unit is believed to be in appropriate conservation management.	No
111	001314	Unit 111	This unit is believed to be in appropriate conservation management.	No
112	001315	Unit 112	The current grazing regime is appropriate to maintain/enhance SAC key habitats. Drainage ditches are present in this unit and are likely to be having an adverse effect on the SAC key habitats.	Yes
113	001316	Unit 113	This unit would benefit from a reduction in grazing.	Yes
114	001317	Unit 114	This unit is believed to be in appropriate conservation management.	No
115	001318	Unit 115	This unit is believed to be in appropriate conservation management.	No
116	001319	Unit 116	This unit is believed to be in appropriate conservation management.	No
117	001320	Unit 117	This unit is believed to be in appropriate conservation management.	No
118	001976	Unit 118	This unit is believed to be in appropriate conservation management.	No
119	002176	Unit 119	This unit is believed to be in appropriate conservation management.	No
Unit 120	002451	Unit 120	This unit is believed to be in appropriate conservation management.	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 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

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

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.
Management Plan	The full expression of a designated site’s legal status, vision , features , conservation objectives , performance indicators and management

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

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 ANNEXES

Black Grouse

The number of lekking male black grouse seen on or **within 1km** of the Migneint-Arenig-Dduallt SSSI from 1986-2005 in years when a co-ordinated survey was completed. 1986 and 2005 were surveyed fully as part of the SCARRABS program.

Year	Cwm Hesgyn	Nant Prysor	Fiediog	Penaran	Trawscoed	<i>Total</i>
1986	1	2	1	7	3	19*
1992	3	6		10	1	20
1995	2	2		6	3	13
1997	4	3		6	1	14
1998	2	3		2	1	8
1999	1	1		1	0	3
2000	5	1		2	1	8
2002	2	8	2	4	0	16
2003	2	8		3	0	13
2004	4	4	2	1	0	11
2005	3	1	3	2	0	9
2006	1-2	1-2	2	2	0	6-8
2007	3-4	3	1-2	2	0	9-11

*The 1986 total includes birds seen at Hafod Fawr (1) and Llanycil Common (4).