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on the Conservation of Natural Habitats
and of Wild Fauna and Flora
(92/43/EEC)

Second Report by the United Kingdom under Article 17

on the implementation of the Directive from January 2001 to December 2006

Conservation status assessment for :

H91D0: Bog woodland

H91D0 Bog woodland

Audit trail compiled and edited by JNCC and the JNCC Woodland Lead Coordination Network

This paper and accompanying appendices contain background and data used to complete the standard EC reporting form (Annex D), following the methodology outlined in the document entitled "Assessment, monitoring and reporting under Article 17 of the Habitats Directive, Explanatory Notes & Guidelines, Final Draft 5, October 2006." The superscript numbers below cross-reference to the headings in the corresponding Annex D reporting form. This supporting information should be read in conjunction with the UK approach for habitats (see 'Assessing Conservation Status: UK Approach').

1. National-Biogeographic Level Information

1.1 General description and correspondence with NVC and other habitat types

Under certain combinations of physical circumstances in the UK, scattered trees can occur across the surface of a bog in a relatively stable ecological relationship as open woodland, without the loss of bog species. This true Bog woodland is a much rarer condition than the progressive invasion of bogs by trees, through natural colonisation or afforestation following changes in the drainage pattern which leads eventually to the loss of the bog community. The habitat type has not previously been well described in the UK, and consequently knowledge of its ecological characteristics is limited.

Table 1.1.1 provides a summary description of H91D0 bog woodland and its relations with UK classifications. Pine bog woodland types are likely to be intermediate in character between NVC type W18 *Pinus sylvestris – Hylocomium splendens* woodland and more open mire types such as M18 *Erica tetralix – Sphagnum papillosum* mire or M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire. The other variant, where birch or willow predominates, are likely to be closest to NVC type W4c *Betula pubescens – Molinia caerulea* woodland *Sphagnum* sub-community or, possibly, W2b *Salix cinerea – Betula pubescens – Phragmites australis* woodland *Sphagnum* sub-community.

Examples of this unusual habitat type are found in areas of Scotland where summer drying may permit the establishment and growth of tree roots in the upper peat layers. The structure and function of this habitat type is finely balanced between tree growth and bog development. Tree growth, however, is always slow (or the trees would take over the bog); the trees are likely to be widely-spaced (because much of the surface area is too wet for them to establish), and dead trees may be common even among the fairly small individuals (because their weight depresses the peat locally leading to waterlogging and death). The principal tree species in this form of Bog woodland is Scots pine *Pinus sylvestris*. Although stunted in form these trees may be of considerable age, with the oldest individuals in bog woodland in Scotland estimated at 350 years old.

The birch or willow bog woodland variant occurs in long-term stable combinations with bog vegetation. Very small fragments occur on New Forest valley bogs and on the fringes of some peat bogs and mere sites in hollows within oakwoods, and other examples in Scotland have developed on M17 *Scirpus cespitosus – Eriophorum vaginatum* blanket mire vegetation.

Secondary birch woodland on degraded bogs, and woodland encroachment resulting from falling water tables, are excluded from the Annex I definition, but may in some circumstances be referable to 7120 Degraded raised bogs still capable of natural regeneration.

Rodwell and Dring (2001) reported on the European context of British H91D0 bog woodland. Willows and *Alnus glutinosa* are too nutrient-demanding to effectively colonise the sort of impoverished wet

habitats associated with the accumulation of acid peat in ombrogenous, topogenous or soligenous mires. Here, it is *Betula pubescens* and *Pinus sylvestris* which are the most important invaders, the former especially in more Atlantic parts of Europe, the latter in the more Boreal. In the latter zone, too, and with the shift to cooler winter temperatures at higher altitudes in the mountains of central Europe, *Picea abies* also plays a role in such bog woodlands, with *Pinus mugo* in the pre-Alps and high mountains where this habitat occurs very locally.

Table 1.1.1 Summary description of habitat H91D0 and its relations with UK vegetation/habitat classifications.

Classification	Correspondence with Annex I type	Comments
EU Interpretation Manual	= H91D0	This includes coniferous and broad-leaved forests on humid to wet peaty substrates, where the water level is permanently high and higher than the surrounding water table. The water is always very poor in nutrients (raised bogs and acid fens). These communities are generally dominated by *Betula pubescens*, *Frangula alnus*, *Pinus sylvestris*, *Pinus rotundata* and *Picea abies*, with species specific to open bog or, more generally, oligotrophic environments, such as *Vaccinium* spp., *Sphagnum* spp., *Carex* spp. [Vaccinio-Piceetea: Piceo-Vaccinienion uliginosi (Betulion pubescentis, Ledo-Pinion) amongst other types]. In the Boreal region, the type also includes spruce swamp woods, which are minero-trophic mire sites along the margins of different mire complexes and in separate strips in valleys and along brooks. Four sub-types are identified: Sphagnum birch woods; Scots pine mire woods; Mountain pine bog woods; and Mire spruce woods.
National Vegetation Classification (NVC) (see Rodwell 1991, Hall 1997)	H91D0 is mostly accommodated either by (i) W18 *Pinus-Hylocomium* woodland/M18 *Erica tetralix – Sphagnum papillosum* mire and M19 *Calluna vulgaris – Eriophorum vaginatum* mire transitions; or (ii) stands of W4c *Betula pubescens – Molinia caerulea* woodland *Sphagnum* sub-community or (possibly) W2b *Salix cinerea – Betula pubescens – Phragmites australis* woodland *Sphagnum* sub-community.	The Scots pine bog woodland variant of H91D0 is largely transitional between W18 woodland and mire communities particularly M18 *Erica tetralix – Sphagnum papillosum* mire and M19 *Calluna vulgaris – Eriophorum vaginatum* mire. The birch or willow variant is likely to be closest to W4c *Betula pubescens – Molinia caerulea* woodland *Sphagnum* sub-community or, possibly, W2b *Salix cinerea – Betula pubescens – Phragmites australis* woodland *Sphagnum* sub-community. Secondary birch stands on degraded bogs, and woodland encroachment resulting from falling water tables, are excluded.
BAP priority habitat type	H91D0 forms a small part the BAP wet woodland priority habitat	Although technically H91D0 is part of the wet woodland priority habitat types, stands often occur as small pockets within other priority habitat types, notably native pinewoods and upland oak woods.

The mire surface over which such invasion takes place characteristically has some *Sphagnum* spp., which play an important role in the accumulation of the peat in many of the more active mires included here, and various sub-shrubs like *Vaccinium myrtillus, V. vitis-idaea* and *V. uliginosum* which tends to be more

prominent in drier situations, as on the hummocks of patterned bogs. Boreal herbs such as *Trientalis europaea* and *Andromeda polifolia* can also figure prominently, even outside the strictly Boreal zone where they benefit from the low competition that characterises this kind of acidic and impoverished habitat. In mires maintained more by the soligenous input of water, more minerotrophic plants like *Molinia caerulea* and *Juncus effusus* and poor-fen herbs like *Viola palustris* can be prominent under the tree canopy.

Where downy birch is the leading invader, the characteristic woodland type that develops here is the *Betuletum pubescentis* R.Tx. 1937 (=*Vaccinio uliginosi-Betuletum* Libbert 1932), the type association of the first alliance mentioned as included here - the *Betulion pubescentis* Lohm. & Tx. in Tx, *ex* Oberd. 1957. In western Europe, this vegetation is characteristic of those mires which remain wet enough to prevent the peat becoming mineralised but dry enough to sustain a cover of trees. The community has been reported from the raised bogs which survive now very locally throughout the lowlands of Germany, Belgium, The Netherlands and France and in less minerotrophic valley bogs and ungrazed poor-fens. It characteristically has an open and somewhat decrepit birch canopy, sometimes with a little *Sorbus aucuparia* and *Frangula alnus,* and a field layer whose precise floristics reflect the kind of mire surface on which the succession is taking place. The UK W4 *Betula-Molinia* woodland is clearly of this type and can be found in the whole range of mire habitats in which birch invasion naturally occurs, though the W4c *Sphagnum* sub-community is the most strictly boggy form. More recently from The Netherlands, two communities, the *Erico-Betuletum* Hueck *ex* Tüxen (1937) and the *Carici curtae-Betuletum* Stortelder *et al*. 1998 have been described as including the sort of floristic variation subsumed in the various sub-communities described from Britain.

Birch invasion (often also involving *B. pendula)* and the more rapid development of *Quercion* woodland has been widespread on drained and cut-over raised bogs (the majority) throughout the Atlantic zone but these have not been included in this assessment.

2. Range [2.3]

2.1 Current range

Range surface area [2.3.1]: **31,072 km²**
Date calculated [2.3.2.]: **May 2007**
Quality of data [2.3.3.]: **Poor**

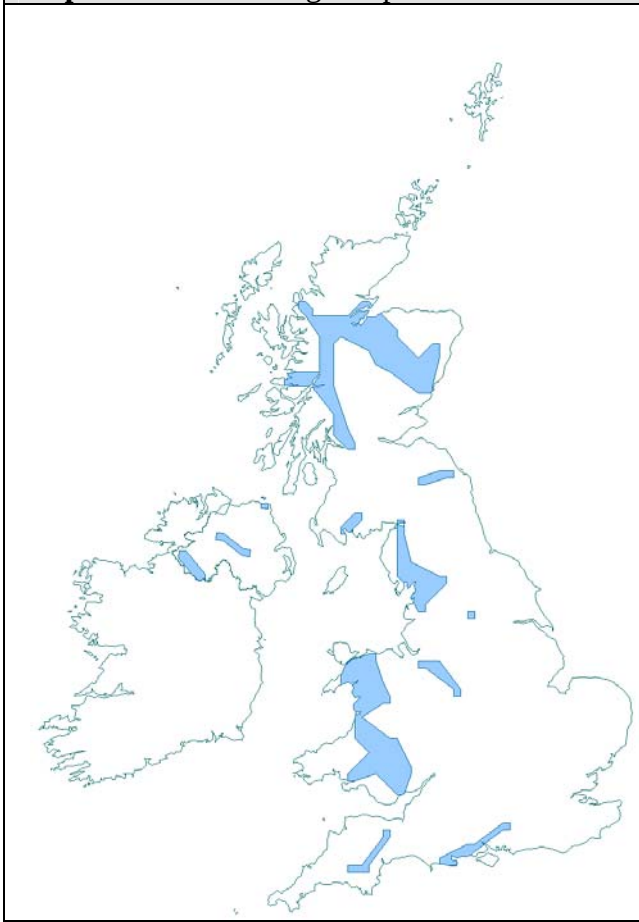
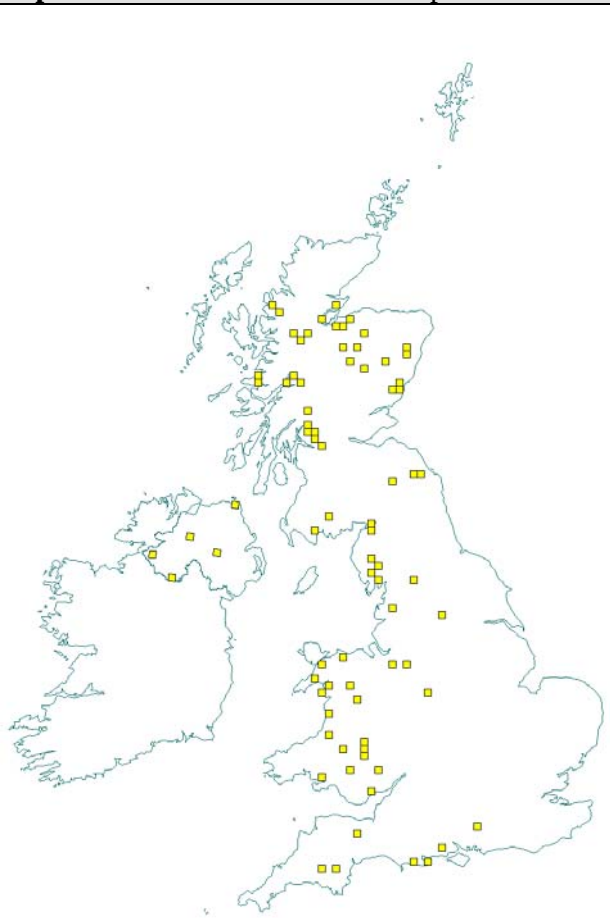
Maps 2.1.1 and 2.1.2 show the range and distribution of H91D0 bog woodland in the UK. This is based on updated records in the JNCC Woodland NVC Community database. Included are all SACs for H91D0 and all recorded stands and transitions of NVC type W4c.

The maps are likely to be an incomplete representation of the actual range of H91D0. No attempt has been made to accommodate Scots pine bog woodland stands beyond SACs: data on their distribution cannot be easily obtained. Appendix 2 of MacKenzie and Worrell (1995) shows the distribution of wooded bogs in Scotland as recorded by the Land Cover of Scotland 1988, but a good many of the sites may represent tree invasion onto degraded bog. In addition, bog woodland has generally not been identified in previous woodland surveys, the assumption tending to be that trees on bogs are a sign of degradation of the bog through drainage.

2.2 Trend in range since c.1994

Trend in range[2.3.4]: **Stable**
Trend magnitude[2.3.5]: **Not applicable**
Trend period[2.3.6]: **1994-2006**
Reasons for reported trend[2.3.7]: **Not applicable**

The broad range of H91D0 bog woodland appears to have not changed since 1994.

Map 2.1.1 Habitat range map [1.1] for H91D0	**Map 2.1.2** Habitat distribution map [1.2] for H91D0
	
Range envelope shown in blue/grey shade in above map is a minimum convex polygon constructed using JNCC Alpha Shapes tool (see Technical Note I for details of methodology)	Each yellow square represents a 10x10km square of the National Grid and shows the known and/or predicted occurrence of this habitat 10-km square count: 78

See Section 7.1 for data sources

2.3 Favourable reference range

Favourable reference range[2.5.1]: Approx. 31,000 km^2

Section 3.2.1.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference range estimates for habitats have been determined in the UK. Based on this approach, the current surface area, c.31,000 km^2, has been set as the favourable reference area. Reasons for this are discussed below.

The current range of H91D0 bog woodland appears to be sufficiently large and (for the most part) compact not to raise any major concerns about the viability of the habitat on these accounts, i.e. it can be taken to be approximately equal to the favourable reference range. Even with incomplete data on the distribution of H91D0, the range envelope shown in Map 2.1.1. covers around 31,000 km^2. If records for Scots pine bog woodland were included then the range would probably be increased across the Scottish Highlands, though wooded pine bogs do not appear to occur in any of the western pinewoods with the exception of the Loch Maree Islands (MacKenzie and Worrell 1995, p.32). Records for birch/willow-dominated bog woodland are also probably lacking.

The current range appears to include a substantial part of its former/potential natural range (MacKenzie and Worrell 1995). This was impacted on by the rapid spread of blanket peat from about 4,000 years ago, which was driven by natural climatic change (resulting in increased paludification) and possibly by the clearance of trees by people. As a result, the widespread occurrence of bog woodland in upland areas

supporting peaty soils seems to have been increasingly limited. Significant areas of the habitat were lost in Scotland within the historic and recent past, but this is likely to have affected area more than range. Formerly, the habitat probably also occurred in small scattered patches throughout lowland areas, including central and southern England. Many such sites have been lost due to widespread drainage and conversion, though their demise largely took place long ago.

2.4 Conclusions on range

Conclusion[2.6.i]: Favourable

The habitat range seems sufficiently large and compact and has been relatively stable since 1994 and over the last few decades at least. Much of the natural range appears to be accommodated within the broad limits of the current range. Major breaks, which in part are due to under-recording, are mostly long-standing and often reflect limitations imposed by the availability of suitable sites. The current range area of H91D0 is therefore taken to be viable and approximately equal to that of the favourable reference range.

3. Area [2.4]

3.1 Current area

Total UK extent [2.4.1]: 12km^2
Date of estimation [2.4.2]: May 2007
Method [2.4.3]: 1 = only or mostly based on expert opinion
Quality of data [2.4.4]: Poor

Table 3.1.1 provides information on the area of H91D0 bog woodland in the UK, which is estimated to total approximately 1,200 ha. All the values given are based on expert opinion, as there is no comprehensive data available on the habitat extent. The figure for Scotland, which supports most of the resource, represents a crude approximation. MacKenzie and Worrell (1995) present data on wooded bogs in Scotland and report that in the Land Cover of Scotland 1988 'blanket bog and other peatland vegetation, no erosion, with scattered trees' cover 5,500ha. While this includes some true bog woodland, much of it is probably areas of tree invasion on to degraded bog (which is outside the scope of H91D0).

Table 3.1.1 Area of H91A0 in the UK

	Area (ha)	Method [2.4.3]	Quality of data [2.4.4]
England	100 (approx.)	1	Poor
Scotland	1,000 (approx.)	1	Poor
Wales	75 (50-100)	1	Poor
Northern Ireland	20 (15-25)	1	Poor
Total UK extent [2.4.1]	1,200 (approx.)	1	Poor

Method used to estimate the habitat surface area: 1 = only or mostly based on expert opinion; 2 = based on remote sensing data; 3 = ground based survey. Only the most relevant class is given if more than one applies.
Quality of habitat surface area data: 'Good' e.g. based on extensive surveys; 'Moderate' e.g. based on partial data with some extrapolation; 'Poor' e.g. based on very incomplete data or on expert judgement

3.2 Trend in area since c.1994

Trend in area[2.4.5]: Stable
Trend magnitude[2.4.6]: Not applicable
Trend period[2.4.7]: 1994-2006
Reasons for reported trend[2.4.8]: Not applicable

Trends in the area of H91D0 bog woodland since 1994 are not precisely documented. The habitat appears to have suffered a similar fate to other types of native woodland during recent decades, i.e. various forms of exploitation (especially drainage, afforestation, over-grazing and burning) have lead to a severe

reduction in their extent and alterations to their composition (MacKenzie and Worrell 1995). Such losses have largely been stemmed in recent years and various actions have been taken to restore damaged sites, for example at Monadh Mor SAC (see http://www.wetwoods.org/sites/Monadhmor.htm). Restoration of this habitat is, nevertheless, a gradual process and typically takes many years before the full characteristics of the former habitat can be regained (Legg *et al.* 2003). Without further and more precise information on changes in the area of the habitat, it is assumed that the overall extent has probably remained more-or-less stable since 1994.

3.3 Favourable reference area

Favourable reference area[2.5.2]: Approx. 13.2 km^2

Section 3.2.2.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference area estimates have been determined in the UK. Based on this approach, the favourable reference area has been identified as greater than the current extent, but not by a factor of more than 10%. Reasons for this are discussed below.

H91D0 bog woodland is a scarce resource in the UK. The current area estimate is only 1,200 ha and this is spread very thinly across its range (see Section 2.2). Even where it does occur, it often comprises small, fragmentary stands. Opportunities for interaction between sites seem very limited and the long-term stability of hydrological conditions at small sites is not secure. Accordingly, there seems to be a general consensus amongst woodland conservationists that this habitat is too fragmented and isolated to be sure that all of the component species and individuals site can perpetuate themselves.

Concern about the limited extent and patchy occurrence of the habitat is heightened by the scale of loss of bog woodland, compared to its natural status and given that its area is at an historical low (see MacKenzie and Worrell 1995). Bog woodland undoubtedly did once cover a much greater area than at present and little of this now survives. Its former extent was substantially reduced by the rapid spread of blanket peat, driven by natural climatic change (which increased paludification) and possibly in combination with woodland clearance. In the uplands it probably became increasingly marginalised. Further losses have occurred more recently in Scotland and elsewhere through drainage, planting, burning, grazing and other factors. Wooded bogs were targeted as indicative of potentially plantable areas in the earlier days of plantation forestry. Further, even where bog woodland sites themselves were not directly drained and planted, planting up to and around the margins affected their hydrology and many subsequently dried out and lost characteristic features. Most lowland raised bogs have been badly affected by drainage and few now support anything that resembles bog woodland. These losses have not been quantified, but are thought to have been severe. Such loss has now been stemmed, but they further increased fragmentation and isolation which were already profound.

It would have been particularly important in upland areas supporting peaty soils, with forested mires once fairly widespread in a matrix of drier forest, with areas in the north most likely to have carried more extensive areas of bog woodland. Small patches also probably occurred on and around peat bogs throughout lowland areas.

Over the last half century there has been some compensatory expansion due to increased drainage on or around formerly treeless bogs and reductions in grazing pressure. Such woodland will however rarely develop the necessary characteristics to qualify as H91D0 bog woodland (even though it has sometimes been included in areas estimates for wooded bogs, e.g. Land Cover of Scotland 1988). Some works have also been taken to restore damaged sites, e.g. removing planted trees and blocking drains, but regaining the characteristics of former habitat will take time and is not certain.

The bulk of the resource typically merges into either semi-natural bog or woodland, which provides some degree of connectivity between bog woodland sites. Fragmentation and isolation are anyway most likely to lead to impoverishment rather than complete habitat loss, so the view taken is that an increase of no

more than 10% above the current area of H91D0 is necessary to remedy this issue, i.e. the favourable reference area is judged to be no more than 10% above the current area of c.1,200 ha.

3.4 Conclusions on area covered by habitat

Conclusion[2.6.ii]: Unfavourable – Inadequate

This habitat is scarce and spread very thinly across the UK, often in small stands. It appears to be too fragmented and isolated to be sure that the habitat can perpetuate itself. Concern is heightened by the scale of habitat loss, compared to its natural status and given that its area seems to be at an historical low. Although much of its former area was lost long ago and parts of its demise was due to the spread of blanket peat, there were further severe declines during the last century. Despite some recent efforts to restore damaged bog woodland sites, restoration of this habitat takes time and the outcome is not certain. It is considered unlikely that the remedy to this situation requires an increase of more than 10% above the current habitat area, so the favourable reference area is taken to be no more than 10% above this.

4. Specific Structures and Functions **(including typical species)**

4.1 Main pressures [2.4.10]

The main pressures likely to be affecting H91D0 are listed below. These are derived mainly from the UK BAP Habitat Action Plan for wet woodland (making allowance for those likely to be relevant to Bog Woodland), via the adverse features listed in Common Standards Monitoring condition assessments (see Section 4.2.1.), and from MacKenzie and Worrell (1995). The related EC codes are shown in brackets.

- Inappropriate grazing levels and soil poaching (**140 Grazing, 967 antagonism with domestic animals**)
- Drainage (**810 Drainage**)
- Burning (**180 Burning**)
- Erosion (**900 Erosion**)
- Poor water quality (**701 water pollution**)
- Clearance (**164 Forestry clearance**)
- Afforestation (**162 Artificial planting**)
- Air pollution (**702 air pollution**)

4.2 Current condition

4.2.1 Common Standards Monitoring condition assessments

Condition assessments based on Common Standards Monitoring (see http://www.jncc.gov.uk/page-2199) provide a means to assess the structure and functioning of H91D0 in the UK. The following attributes were examined for all CSM assessments relevant to the habitat:

- Extent
- Structure and natural processes
- Regeneration potential
- Composition (trees and shrubs)
- Indicators of local distinctiveness

SAC condition assessments

Table 4.2.1 and Map 4.2.1 summarise the Common Standards Monitoring condition assessments for UK SACs supporting habitat H91D0. These data were collated in January 2007. The maps give an impression of the overall spread of where Unfavourable and Favourable sites exist (summary statistics for the map are given in Section 7.2.). The combined assessments show that of the SACs assessed 42% of the area and 56% of the number of assessments was Unfavourable. This means that at least 31% of the total UK

habitat area was in Unfavourable condition. The majority of the Unfavourable area was however classed as recovering suggesting that for this the main adverse factors were being addressed.

Table 4.2.1 Common Standards Monitoring condition assessment results for UK SACs supporting H91D0. See notes below table for details. Information on coverage of these results is given in Section 7.2.

Condition	Condition sub-categories	Area (ha)	Number of site features
Unfavourable	Declining	8	2
	No change	28	1
	Unclassified	34	1
	Recovering	309	5
	Total	380	9
	% of all assessments	***42%***	***56%***
	% of total UK resource	***31%***	***unknown***
Favourable	Maintained	523	6
	Recovered	0	0
	Unclassified	6	1
	Total	530	7
	% of all assessments	***58%***	***44%***
	% of total UK resource	***43%***	***unknown***

Notes

1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC. (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC)
3. Only assessments made for qualifying interest features on SAC have been included in this analysis.
4. Area figures for CSM assessments have been calculated using the data presented on standard Natura 2000 data forms submitted to the EU.

SSSI/ASSI condition assessments

Table 4.2.2 and Maps 4.2.2 and 4.2.3 summarise the Common Standards Monitoring condition assessments that were judged to be either strongly or weakly indicative of the condition of the Annex I habitat on SSSI/ASSIs (see Technical Note II for details of methodology behind this). These data were collated in January 2007. The maps give an impression of the overall spread of where Unfavourable and Favourable sites exist (summary statistics for the maps are given in Section 7.2.). The combined condition assessments show that of the SSSI/ASSI assessments considered 70% weakly indicative assessments were Unfavourable. Almost half were classed as recovering.

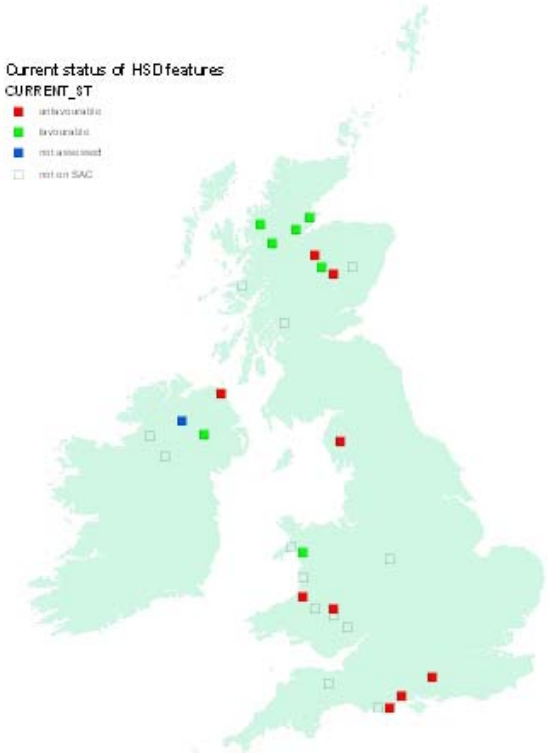
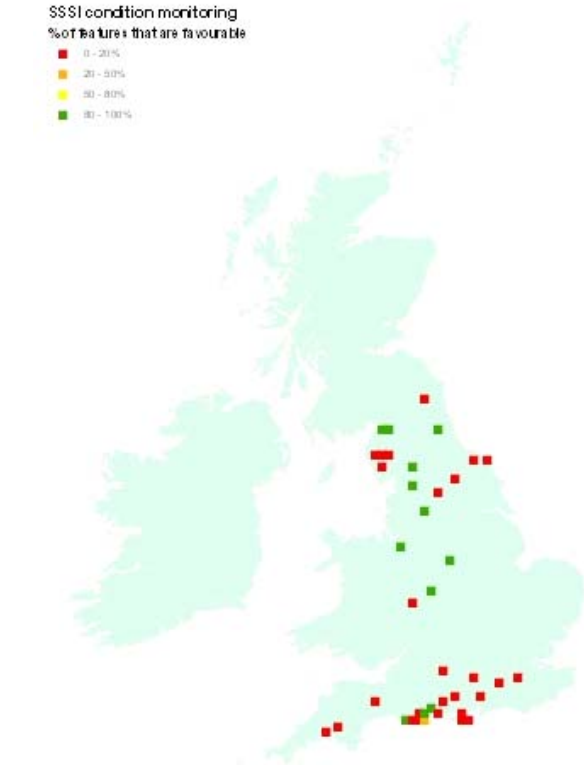
Table 4.2.2 Common Standards Monitoring condition assessment results for UK SSSI/ASSIs that were judged to be either strongly or weakly indicative of the condition of H91D0 on SSSI/ASSIs. See notes below table and Technical Note II for further details.

Condition	Condition sub-categories	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Unfavourable	Declining		9
	No change		7
	Unclassified		0
	Recovering		14
	Total		30
	% of all assessments		***70%***
Favourable	Maintained		0
	Recovered		0
	Unclassified		13
	Total		13
	% of all assessments		***30%***

Notes

1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition; 2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC. (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC)

Current Condition of H91D0 based on Common Standard Monitoring condition assessments (See Sections 4.2 and 7.2 for further information)

Map 4.2.1 SAC assessments	**Map 4.2.2** Assessments strongly indicative of the condition on SSSI/ASSIs	**Map 4.2.3** Assessments weakly indicative of the condition on SSSI/ASSIs
	Not applicable	
Key Red = Unfavourable, i.e. the square contains at least one SAC where this habitat feature is present and has been judged to be Unfavourable Green = Favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been assessed as Favourable but there are no Unfavourable SAC features Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported Transparent = SAC feature not present, i.e. the square does not contain any SAC features of this habitat type	Key* Green – 80 – 100% of assessed features on 10km square are Favourable Yellow - 50 – 80% of assessed features on 10km square are Favourable Orange - 20 – 50% of assessed features on 10km square are Favourable Red - 0 – 20% of assessed features on 10km square are Favourable *This is the same key as was used for JNCC CSM Report 2006	

4.3 Typical species

Typical species[2.5.3]: **None used**

Typical species assessment[2.5.4]: **Not applicable**

Characteristic ground plants for this habitat listed in the EU Interpretation Manual (native to the UK) are not particularly faithful to H9190. Therefore, available trend data on these species at the UK-level or even the GB-woodland-level is not particularly meaningful and has not been utilised here.

4.4 Conclusions on specific structures and functions (including typical species)

Conclusion[2.6.iii]: **Unfavourable – Bad but improving**

The EC Guidance states that where "more than 25% of the area of the habitat is Unfavourable as regards its specific structures and functions", the conclusion should be Unfavourable – Bad. In the UK this was generally taken to mean that more than 25% of the habitat area in Unfavourable condition.

The main pressures are inappropriate grazing levels and soil poaching, drainage, burning, erosion, poor water quality, clearance, afforestation, and air pollution. Condition assessments for SACs and SSSIs show that a large part of the habitat is in Unfavourable condition: 42-56% of assessed SACs are judged Unfavourable, whilst the level for relevant SSSI/ASSIs is 70%. Much of this is nevertheless recovering in condition.

5. Future Prospects

5.1 Main factors affecting the habitat

5.1.1 Conservation measures

Considerable work has recently gone into improving the condition and restoring degraded areas of H91D0 bog woodland. The habitat forms a part of the UK BAP wet woodland habitat action plan (available via http://www.ukbap.org.uk/), which has targets to: (i) maintain the current habitat extent and distribution; (ii) improve its condition; (iii) expand its area by planting or natural regeneration; and (iv) restore former areas that have been converted to non-native plantations. Although new and restored areas of habitat will take to mature, it is expected that they will make an increasing contribution to the resource over the coming decades.

Statutory site protection plays an important part in the conservation of this habitat type. Designation as Sites of Special Scientific Interest (SSSI) or as Areas of Special Scientific Interest (ASSI) (Northern Ireland) of about 5-10% of the more important areas of wet woodland ensures compulsory consultation with the statutory nature conservation agencies over management operations and development proposals. A number have been designated as SACs for H91D0 in response to the EC Habitats Directive (see http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H91D0). National forestry policy includes a presumption against clearance of native woodland for conversion to other land uses, and in particular seeks to maintain the special interest of ancient semi-natural woodland. Various other measures and initiatives have been put in place to help conserve bog woodland: for example, The Wet Woods Restoration Project that aimed to restore areas of bog woodland at five sites in Scotland (see http://www.wetwoods.org), and The New Forest Life III Wetlands Project that has focused on restoring bog woodland in the New Forest SAC (see http://www.newforestlife.org.uk).

5.1.2 Main future threats[2.4.11]

The most obvious major threats to H91D0 over the next 12-15 years are listed below. The related EC codes are shown in brackets.

- Inappropriate grazing levels and soil poaching (**140 Grazing, 967 antagonism with domestic animals**)
- Drainage (**810 Drainage**)
- Burning (**180 Burning**)

- Erosion (**900 Erosion**)
- Poor water quality (**701 water pollution**)
- Afforestation (**162 Artificial planting**)
- Air pollution (**702 air pollution**)

5.2 Future condition **(as regards range, area covered and specific structures and functions)**

5.2.1 Common Standards Monitoring condition assessments

The Common Standards Monitoring condition assessments reported in Sections 4.2.1-2 provide a basis to crudely predict the possible future condition of H91D0 in the UK. This involved treating all assessments currently identified as either Favourable or Unfavourable recovering as future-Favourable: remaining categories were treated as future-Unfavourable – see Table 5.2.1.1. There are a number of caveats to this approach, which are set out beneath this table.

SAC condition assessments

Table 5.2.1 and Map 5.2.1 summarise the possible future condition of H91D0 on UK SACs. This is based on the approach described above. The maps give an impression of the overall spread of where future-Unfavourable and future-Favourable sites might occur (summary statistics for the map are given in Section 7.2.). The combined assessments show that of the SACs assessed 92% of the area and 75% of the number of assessments fall within the future-Favourable category. This means that at least 68% of the total UK habitat area falls within this category.

Table 5.2.1 Predicted future condition of UK SACs supporting H91A0 based on current Common Standards Monitoring condition assessments. See notes below table for details. Information on the coverage of these results is given in Section 7.2.

Future condition	Present condition	Area (ha)	Number of site features
Future-Unfavourable	Unfavourable declining	8	2
	Unfavourable no change	28	1
	Unfavourable unclassified	34	1
	Total	***71***	***4***
	% of assessments	***8%***	***25%***
	% of total UK extent	***6%***	***Unknown***
Future-Favourable	Favourable maintained	523	6
	Favourable recovered	0	0
	Unfavourable recovering	309	5
	Favourable unclassified	6	1
	Total	839	12
	% of assessments	***92%***	***75%***
	% of total extent	***68%***	***Unknown***

Note that the scenario presented above is based on the same information as used to construct the Table 4.2.1. It is based on the following premises:

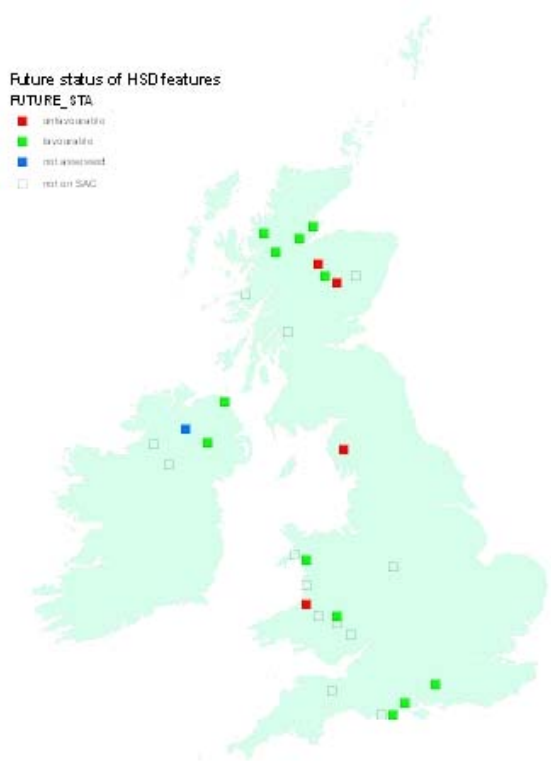
(i) the Unfavourable-recovering condition assessments will at some point in the future become Favourable.

(ii) all Unfavourable-unclassified sites will remain Unfavourable, which is probably overly pessimistic;

(iii) sympathetic management will be sustained on sites already classified as Favourable and these will not be seriously damaged by any unforeseen events.

IMPORTANT NOTE: we do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'Favourable' condition being attained.

Predicted Future Condition of H91D0 based on Common Standard Monitoring condition assessments (See Sections 5.2 and 7.2 for further information on these maps)

Map 5.2.1 SAC assessments	**Map 5.2.2** Assessments strongly indicative of the condition on SSSI/ASSIs	**Map 5.2.3** Assessments weakly indicative of the condition on SSSI/ASSIs
	Not applicable	
Key Red = future-Unfavourable, i.e. the square contains one or more SACs where this habitat feature is present and has been predicted to be future-Unfavourable Green = future-Favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been predicted to be future-Favourable Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported Transparent = SAC feature not present, i.e. the square contains some examples of the habitat type but none are SAC features	Key* Green – 80 – 100% of assessed features on 10km square are Favourable Yellow - 50 – 80% of assessed features on 10km square are Favourable Orange - 20 – 50% of assessed features on 10km square are Favourable Red - 0 – 20% of assessed features on 10km square are Favourable *This is the same key as was used for JNCC CSM Report 2006	

SSSI/ASSI condition assessments

Table 5.2.2 and Maps 5.2.2 and 5.2.3 summarise the possible potential future condition of H91D0 on UK SSSI/ASSIs. This is based on the approach described above and utilises condition assessments that were judged to be either strongly or weakly indicative of the condition of the Annex I habitat on SSSI/ASSIs (see Technical Note II for details of methodology behind this). The maps give an impression of the overall spread of where future-Unfavourable and future-Favourable sites might occur (summary statistics for the maps are given in Section 7.2.). The combined condition assessments show that 63% of weakly indicative SSSI/ASSI assessments fall within the future-Favourable category.

Table 5.2.2 Predicted future condition of H91A0 on SSSI/ASSIs based on Common Standards Monitoring assessments that were judged to be either strongly or weakly indicative of the condition. See notes below table and Technical Note II for further details.

Future condition	Present condition	Number of assessments	
		Strongly indicative assessments (Category 1)	Weakly indicative assessments (Category 2)
Future-Unfavourable	Unfavourable declining		9
	Unfavourable no change		7
	Unfavourable unclassified		0
	Total		***16***
	% of assessments		***37%***
Future-Favourable	Favourable maintained		0
	Favourable recovered		0
	Unfavourable recovering		14
	Favourable unclassified		13
	Total		27
	% of assessments		***63%***

Note that the scenario presented above is based on the same information as used to construct the Table 4.2.2. It is based on the following premises:

(i) the Unfavourable-recovering condition assessments will at some point in the future become Favourable.

(ii) all Unfavourable-unclassified sites will remain Unfavourable, which is probably overly pessimistic;

(iii) sympathetic management will be sustained on sites already classified as Favourable and these will not be seriously damaged by any unforeseen events.

IMPORTANT NOTE: we do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'Favourable' condition being attained.

5.3 Conclusions on future prospects **(as regards range, area covered and specific structures and functions)**

Conclusion[2.6.iv]: Favourable

The EC Guidance states that where "habitat prospects are good with no significant impacts from threats expected and long-term viability assured", the judgement should be Favourable. In the UK, this was generally taken to mean that range and/or area are stable or increasing, and more than 95% of the habitat area is likely to be in Favourable condition in 12-15 years.

A number of positive conservation measures have been put into place to improve the status of this habitat. The main threats that remain are from inappropriate grazing levels and soil poaching, drainage, burning, erosion, poor water quality, and air pollution. Condition assessments for the relevant SACs indicate that 75-92% of sites may become Favourable in the foreseeable future. Relevant condition assessments for SSSIs put 63% of sites within this category. Given progress already made and some additional recovery once further conservation measures are put into place, the expectation is that most of the will be in Favourable condition in the next 12-15 years.

6. Overall Conclusions and Judgements on Conservation Status

Conclusion[2.6]: Unfavourable – Bad but improving

On the basis of Structure and Function, the overall conclusion is Unfavourable – Bad but improving.

Table 6.1 Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Favourable	Current range is stable and not less than the favourable reference range.	2
Area covered by habitat type within range	Unfavourable – Inadequate	Current area is below the favourable reference area, but not by more than 10%. It has, nevertheless, remained relatively stable in extent since 1994.	2
Specific structures and functions (including typical species)	Unfavourable – Bad but improving	More than 25% of the habitat area is considered to be unfavourable as regards its specific structures and functions. Much of that which is in Unfavourable condition is recovering.	2
Future prospects (as regards range, area covered and specific structures and functions)	Favourable	Habitat prospects over the next 12-15 years considered to be good with no significant impacts from threats expected and long-term viability assured. A number of positive conservation measures have been put into place to improve the status of this habitat. Given progress already made and some additional recovery once further conservation measures are put into place, the expectation is that most of this habitat will be in Favourable condition in the next 12-15 years.	2
Overall assessment of conservation status	Unfavourable – Bad but improving	On the basis of Structure and Function, the overall conclusion is Unfavourable – Bad but improving.	2

Key to confidence in judgement: 1 = High; 2 = Medium; 3 = Low

7. Annexed Material **(including information sources used 2.2)**

7.1 References

HALL, J. 1997. An analysis of National Vegetation Classification survey data. JNCC Report 272, Peterborough.

LEGG, C., MCHAFFIE, H., AMPHLETT, A. & WORRELL, R. 2003. The status of wooded bogs at Abernethy, Strathspey. In: Restoring Natura Forest Habitats. Report of a LIFE-Nature Conference, Fort William, October 2001. Highland Birchwoods, Munlochy. p.12-16.

MACKENIZE, N.A. & WORRELL, R. 1995. A preliminary assessment of the ecology and status of ombrotrophic wooded bogs in Scotland. SNH Research, Survey & Monitoring Report 40.

RODWELLl, J.S. (ed.) 1991. British Plant Communities Volume 1: Woodlands and Scrub. Cambridge University Press, Cambridge.

RODWELL, J. & DRING, J. 2001. European significance of British woodland types. English Nature Research Report No. 460 (Volumes 1-2). English Nature, Peterborough.

UKBAP Habitat Action Plan for wet woodland. Available via UKBAP website http://www.ukbap.org.uk/

Map Data Sources

JNCC International Designations Database. Joint Nature Conservation Committee.

NVC Woodland Community Access Database. Joint Nature Conservation Committee.

7.2 Further information on Common Standards Monitoring data as presented in Sections 4.2 and 5.2

Table 7.2.1 Summary of the coverage of the data shown in Tables 4.2.1 and 5.2.1

Data	Value
Number of SACs supporting feature (a)	17
Number of SACs with CSM assessments (b)	16
% of SACs assessed (b/a)	94
Extent of feature in the UK – hectares (c)	1,225
Extent of feature on SACs – hectares (d)	911
Extent of features assessed – hectares (e)	910
% of total UK hectarage on SACs (d/c)	74
% of SAC total hectarage that has been assessed (e/d)	100
% of total UK hectarage that has been assessed (e/c)	74

Notes
1. Extent of features on SACs (d) includes only those features that have been submitted on the official Natura 2000 data form as qualifying features. This figure is based on the habitat extent figures presented on standard Natura 2000 data forms.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data form those used in the six year report produced by JNCC (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC)

Table 7.2.2 Summary of grid square map data shown in Maps 4.2.1-3 and 5.2.1-3

Status	Number of squares	Proportion of all squares
Current – Unfavourable (red)	9	30%
Current – Favourable (green)	7	23%
On SAC but not assessed (blue)	1	3%
Not on SAC (transparent)	13	43%
Total Number of 10km squares (any colour)	30	100%
Future – Unfavourable (red)	4	13%
Future – Favourable (green)	12	40%