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

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

H91A0 - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

WALES

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Wales information only)**
1.2 Habitat code	**91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles**

2. Maps

2.1 Year or period	1985-2012
2.3 Distribution map	Yes
2.3 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Atlantic (ATL)**
3.2 Sources of information	Blackstock T. H., Howe E. A., Stevens J. P., Burrows C. R. & Jones P. S. 2010. Habitats of Wales. A comprehensive field survey 1979-1997. University of Wales Press, Cardiff. Forestry Commission. 2011. National Forest Inventory Woodland Area Statistics: Wales: http://www.forestry.gov.uk/website/forestry.nsf/byunique/INFD-8EYJWF Forestry Commission 2018. Top tree diseases: Phytophthora ramorum.https://www.forestry.gov.uk/pramorum [Accessed 21/06/18] Guest, D. 2012. Assessing pressures and threats for Article 17 reporting based on information in CCW's Actions Database. CCW Staff Guidance Note. JNCC, 2017. Habitat account - Forests. 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles http://jncc.defra.gov.uk/protectedsites/sacselection/habitat.asp?FeatureIntCode=H91A0 [Accessed 12/06/18] Keith, S.A., Newton, A.C., Morecroft, M.D., Bealey, C.E. & Bullock, J.M. 2009. Taxonomic homogenization of woodland plant communities over 70 years. DOI: 10.1098/rspb.2009.0938 Latham, J. 2001. National Vegetation Classification of woodland in Wales: a summary of survey results 1985-2000. CCW Natural Science Report, 01/7/1, CCW, Bangor. Latham, J. 2003. Woodlands. In: Priority habitats of Wales: a technical guide. Jones, P.S., Blackstock, T.H., Burrows, C.R. and Howe, E.A. (Eds). Countryside Council for Wales, Bangor. Latham, J. 2010. Woodlands and Scrub. In: Blackstock, T.H., Howe, E.A., Steven, J.P., Burrows, C.R., and Jones, P.S. (Eds). Habitats of Wales: A comprehensive field survey 1979-1997, pp 122-137. University of Wales Press, Cardiff Latham, J., Sherry, J. & Rothwell, J. 2013. Ecological connectivity and biodiversity prioritisation in the terrestrial environment of Wales. CCW Staff Science Report No. 13/3/3. Countryside Council for Wales, Bangor. Latham, J. & Rothwell, J. 2012 Estimates of the area and distribution of woodland Annex 1 types in Wales, based on GIS analyses. CCW Staff Report, CCW Bangor. Natural Resources Wales (NRW). 2013. Supporting documentation for the Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012 Conservation status assessment

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

for Habitat: H91A0 - Old sessile oak woods with Ilex and Blechnum in the British Isles Available from: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/H91A0_WALES.pdf [Accessed 19 /06/18]
Natural Resources Wales (NRW). 2018. SAC and SPA Monitoring Programme Results 2013-2018. Available from: http://lle.gov.wales/catalogue/item/SACSPAMonitoringProgrammeResults/?lang=en [Accessed 19/06/18)]
Sanderson, R. 2006. Predictive modelling to asses the resource of woodland types in Wales. CCW Science Report 738, CCW Bangor.
Watts, K., Griffiths, M., Quine, C., Ray, D. & Humphrey, J.W. 2005. Towards a Woodland Habitat Network for Wales. CCW Science Report 686, CCW Bangor.

4. Range

4.1 Surface area (in km²)		
4.2 Short-term trend Period		
4.3 Short-term trend Direction	Stable (0)	
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum
4.5 Short-term trend Method used		
4.6 Long-term trend Period		
4.7 Long-term trend Direction		
4.8 Long-term trend Magnitude	a) Minimum	b) Maximum
4.9 Long-term trend Method used		
4.10 Favourable reference range	a) Area (km²)	
	b) Operator	
	c) Unknown	No
	d) Method	
4.11 Change and reason for change in surface area of range	No change	
	The change is mainly due to:	
4.12 Additional information		

5. Area covered by habitat

5.1 Year or period	1985-2012		
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value 480
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Based mainly on extrapolation from a limited amount of data		
5.5 Short-term trend Period	2007-2018		
5.6 Short-term trend Direction	Unknown (x)		
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used	Insufficient or no data available		
5.9 Long-term trend Period			
5.10 Long-term trend Direction			
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used			
5.13 Favourable reference area	a) Area (km²)		

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

	b) Operator	
	c) Unknown	No
	d) Method	
5.14 Change and reason for change in surface area of range	No change	
	The change is mainly due to:	
5.15 Additional information		

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	0.32	Maximum	0.32
	b) Area in not-good condition (km²)	Minimum	43.64	Maximum	43.64
	c) Area where condition is not known (km²)	Minimum	436.4	Maximum	436.4
6.2 Condition of habitat Method used	Based mainly on extrapolation from a limited amount of data				
6.3 Short-term trend of habitat area in good condition Period	2007-2017				
6.4 Short-term trend of habitat area in good condition Direction	Unknown (x)				
6.5 Short-term trend of habitat area in good condition Method used	Insufficient or no data available				
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period?		No		
6.7 Typical species Method used					
6.8 Additional information					

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Intensive grazing or overgrazing by livestock (A09)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Thinning of tree layer (B12)	M
Abandonment of traditional forest management (B04)	M
Other climate related changes in abiotic conditions (N09)	M
Agricultural activities generating air pollution (A27)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Intensive grazing or overgrazing by livestock (A09)	H
Mixed source air pollution, air-borne pollutants (J03)	H

Other invasive alien species (other then species of Union concern) (I02)	H
Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02)	M
Thinning of tree layer (B12)	M
Other climate related changes in abiotic conditions (N09)	M
Agricultural activities generating air pollution (A27)	M
Problematic native species (I04)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures

a) Are measures needed? Yes

b) Indicate the status of measures Measures identified and taken

8.2 Main purpose of the measures taken: Maintain the current range, population and/or habitat for the species

8.3 Location of the measures taken: Both inside and outside Natura 2000

8.4 Response to the measures: Medium-term results (within the next two reporting periods, 2019-2030)

8.5 List of main conservation measures

Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Stop mowing, grazing and other equivalent agricultural activities (CA06)
Reduce impact of mixed source pollution (CJ01)
Management, control or eradication of other invasive alien species (CI03)
Reduce impact of hydropower operation and infrastructure (CC04)
Adapt/change forest management and exploitation practices (CB05)
Stop forest management and exploitation practices (CB06)
Maintain existing traditional forest management and exploitation practices (CB02)
Reinstate forest management and exploitation practices (CB03)
Implement climate change adaptation measures (CN02)

8.6 Additional information

9. Future prospects

9.1 Future prospects of parameters

a) Range

b) Area

c) Structure and functions

9.2 Additional information

10. Conclusions

10.1. Range

10.2. Area

10.3. Specific structure and functions (incl. typical species)	
10.4. Future prospects	
10.5 Overall assessment of Conservation Status	
10.6 Overall trend in Conservation Status	
10.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
10.8 Additional information	

11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum b) Maximum c) Best single value 43.64
11.2 Type of estimate	Best estimate
11.3 Surface area of the habitat type inside the network Method used	Complete survey or a statistically robust estimate
11.4 Short-term trend of habitat area in good condition within the network Direction	Stable (0)
11.5 Short-term trend of habitat area in good condition within network Method used	Complete survey or a statistically robust estimate
11.6 Additional information	

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

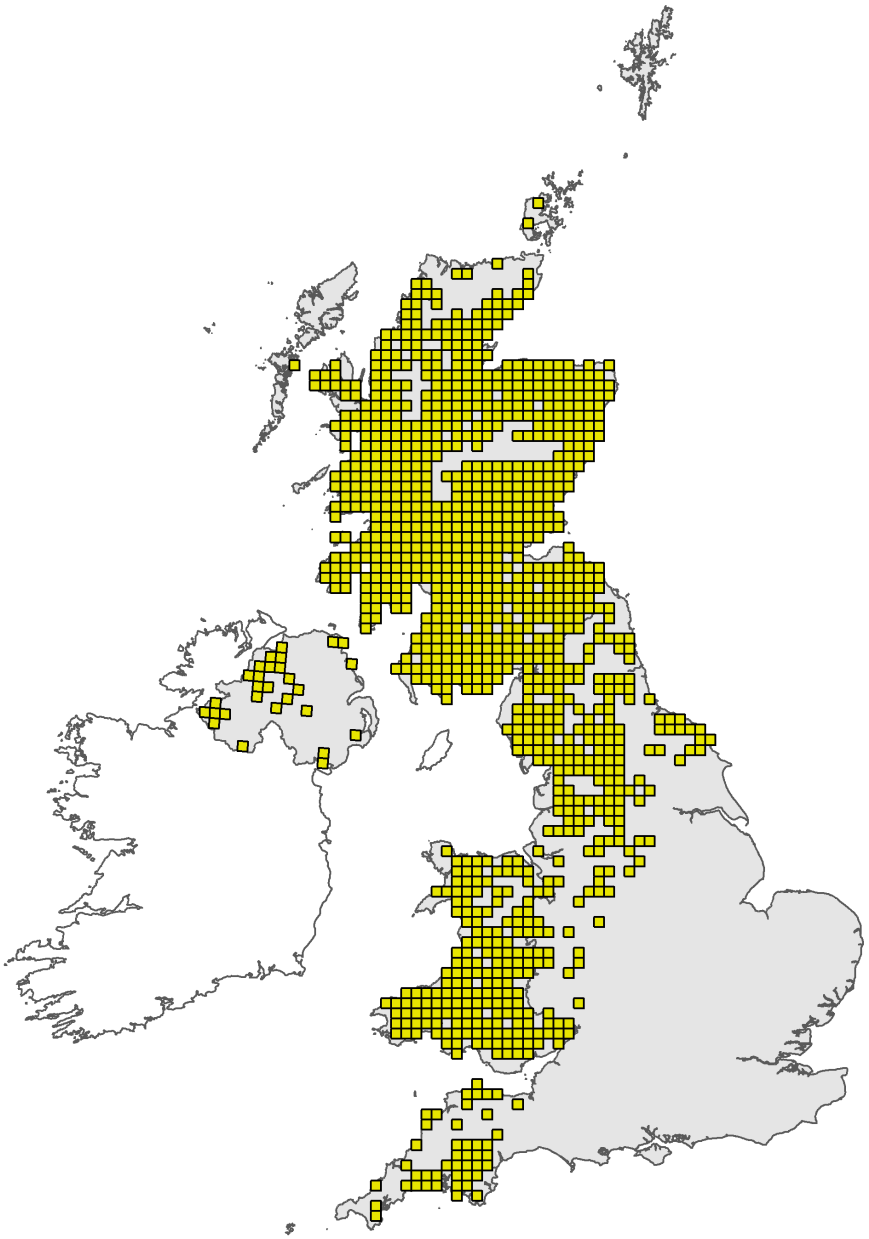

Figure 1: UK distribution map for H91A0 - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

Range Map

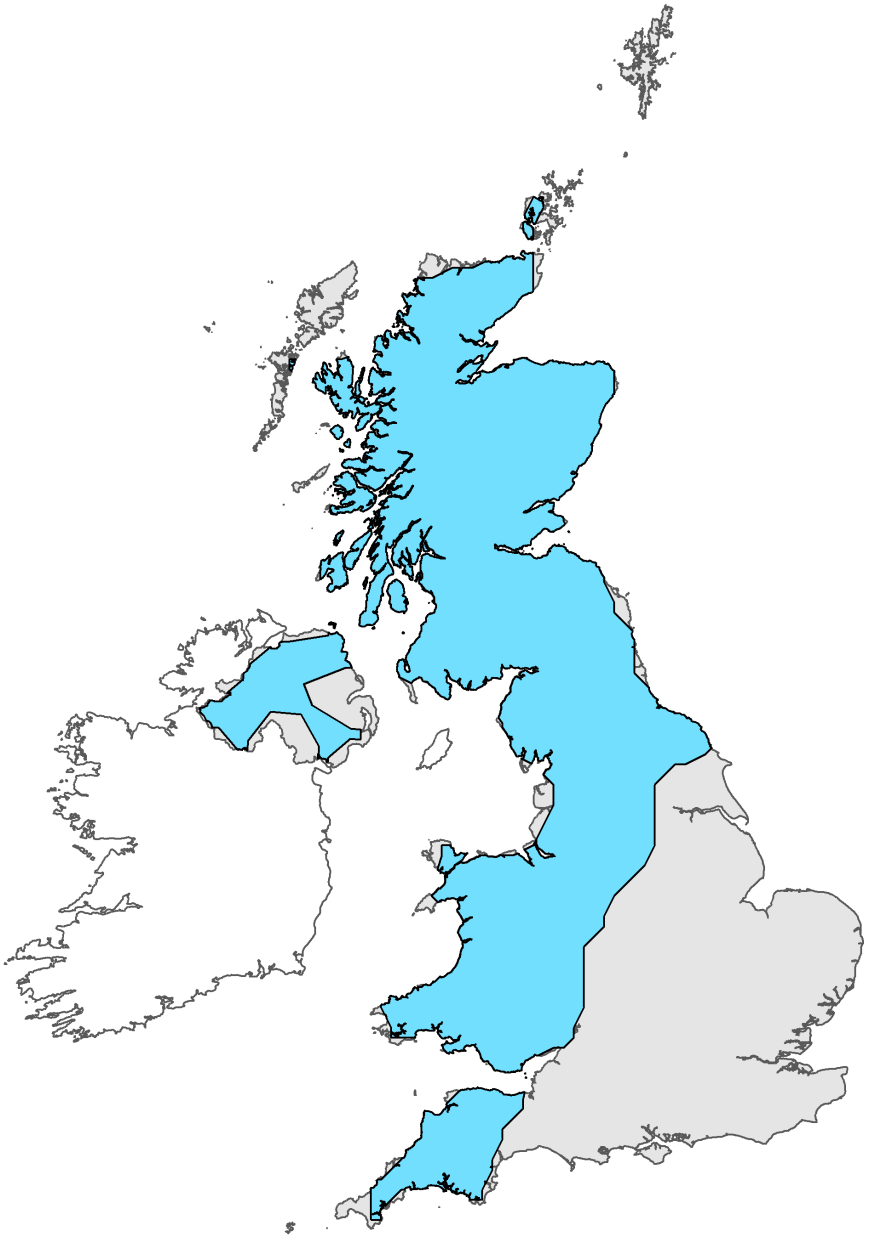

Figure 2: UK range map for H91A0 - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this habitat was 25km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Habitat code: 91A0

Field label	Note
2.1 Year or period	An extensive analysis of the range and extent of H91A0 Old sessile oakwood in Wales was carried out in 2012 using GIS, relevant vegetation surveys, geological and climatic data (Latham and Rothwell, 2012). No new information has become available to significantly or confidently update this analysis, and there is also no reason to expect that the range and extent of the habitat has changed significantly since 2012; any changes are likely to be trivial in comparison to the confidence in the analysis. For these reasons the figures and analysis for 2012 are reproduced here.

2.3 Distribution map; Method used	1985 - 2012 (Analysis as for 2012; see section 2.1). H91A0 Old sessile oakwood with Ilex and Blechnum in the British Isles is widespread in Wales, corresponding to a range of NVC communities (W10e, W11, W16b, W17) (JNCC, 2017) that are well known and have been extensively mapped on both protected sites and in the wider countryside (Latham, 2001). These surveys are considered comprehensive enough to confidently map the distribution and hence range of the habitat in Wales at the scale required for national reporting. Previous analyses (e.g. Latham, 2003) have used a \proportional representation\ approach to estimate total habitat area, applying the proportional abundance of the habitat recorded in Phase 2 surveys to the figure for total woodland cover to estimate a total habitat area. Whilst there are few new survey data, new inventories of total woodland cover have become available (Forestry Commission, 2011), GIS analysis capabilities have improved, and there is an appreciation that the \proportional representation\ method could be refined by stratification of the woodland resource to account for regional variations in woodland cover. An analysis was carried out to to do this which is summarised below and described in detail in Latham and Rothwell (2012). Despite the habitat having been well recorded, it is impossible to produce precise figures for total extent of habitat. This is because the habitat grades, as part of a continuum, into lowland oak woodland types. This variation relates to a suite of intercorrelated variables - including rainfall, soil acidity, and altitude - expressed as an axis from \lowland\ to \upland\ conditions from southeast to northwest Britain (Latham, 2010). Wales lies within a transition zone for much of this variation, meaning that conditions change from \upland\ to \lowland\ over small distances, or may be truly indeterminate. Within an individual wood, it can be an arbitrary decision whether a community is mapped as, for example, W10e (upland) or W10a (lowland), and the difference between the two may in any case be controlled as much by management as by environmental situation. There have been attempts to define cut-off points in terms of environmental variables to help estimate the area of H91A0 (unpublished discussions: CCW, FCW, former woodland LCN). But, although there are clear correlations of H91A0 occurrence with some environmental variables, notably rainfall (e.g. Sanderson, 2006), there is no clear cut-off above which the habitat predominantly occurs to allow simple estimations. Rather, there is an increasing probability of a woodland being H91A0 as rainfall increases, as was expressed in mapping in Latham (2003). A possible approach therefore, is to refine the \proportion representation\ approach by stratifying Wales by rainfall, and estimating the area of H91A0 sequentially in each defined zone. An analysis of the proportion of H91A0 recorded in surveys with respect to rainfall was carried out, using NVC survey data (Latham, 2001) and Met Office data on 1 km2 held on legacy GIS systems. This included 623 survey sites covering a range 650mm - 2050mm annual rainfall. A strong linear relationship was found between rainfall and proportion of H91A0 across this range with no obvious steps or \thresholds\. Applying this result pragmatically, a breakdown into categories of 0-20% oak woodland (<= 868 mm), 20-40% (869-1190 mm), 40-60% (1191-1513mm), 60-80% (1514-1835mm) and 80-100% (>=1836mm) was used. The total area of \Broadleaved\ and \Mixed predominantly Broadleaved\ woodland from the National Forest Inventory (NFI) (Forestry Commission, 2011) were calculated for each of these rainfall bands. From these, the area of H91A0 was estimated using the midpoints of the 5 categories (i.e. 10, 30, 50, 70 and 85%). 85% was adopted rather than 90% to address to a degree the flattening of the curve as it approaches 100% apparent from a handful of samples above 2000mm. The majority of woodland area lies towards the middle of the range, so this approximation is unlikely to have much effect on the results. The analysis was restricted to areas of Wales outside of those within the \beech zone\ and overlying core rock types for \Tilio-Acerion\ woodland (see Latham & Rothwell, 2012. H91A0 will still occur at a reduced frequency within these areas, but is likely to be a minor component, and best treated separately: the area of H91A0 was calculated using simple \proportional representation\ (as in Latham, 2003) but with total woodland cover figures from NFI. Combining the results from all zones, the total

	area of H91A0 in Wales is estimated at c. 48,000 ha. It has been out of scope of this study to formally estimate confidence limits around this figure, but a pragmatic error estimate of +- 10% would give a range of c. 43,000 - 53,000 ha. This compares with a previous estimate of 39,000 ha (Latham, 2003). The increase stems from the larger total area of woodland recorded in NFI compared to Phase 1 (Blackstock et al. 2003) and, in fact, conceals a rather lower overall proportion of H91A0 than previously thought: 39.6% of the total resource compared with 48.1%. This change is due to the stratifed analysis that has taken into account the relatively large areas of woodland in low-medium rainfall areas that have a higher lowland oakwood:H91A0 ratio than the Welsh average.

Habitat code: 91A0 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	See 4.11
4.11 Change and reason for change in surface area of range	The distribution of Old sessile oakwoods in Wales has not been re-assessed for the current report and 10 km squares from which it has been reported are unchanged.
5.1 Year or period	Total evidence range1985-2012. Base area figures from NFI are from 2006 (aerial photography derived, published under NFI 2011), some assumptions on proportions used in calculations derive from surveys accumulated from 1985 - 2000.
5.2 Surface area	The area figures have been derived from analysis of the proportional representation of H91A0 within relevant vegetation surveys, stratified by environmental zones across Wales. The scope of this analysis did not allow for a formal statistical treatment of errors, and some expert judgement has been used to derive pragmatic range values. Also see comments in section 2.3
5.4 Surface area; Method used	The area figures have been derived from analysis of NFI woodland data (Forestry Commission, 2011) relevant vegetation surveys (Latham, 2001), geological and climatic data (NRW and legacy licensed GIS datasets). The scope of this analysis did not allow for a formal statistical treatment of errors, and some expert judgement has been used to derive pragmatic range values. See section 2.3 and Latham and Rothwell (2012) for a fuller description.
5.8 Short term trend; Method used	There is no evidence available to judge short-term trends in the total area of this habitat. The total extent figures are derived from data with a wide time base, and their confidence errors are likely to be very much larger than any figures for ad hoc changes that may be reported.
5.14 Change and reason for change in surface area	The area of the habitat has not been re-assessed for this report and so the values are the same as the 2012 submission.

6.2 Condition of habitat; Method used	Assessment of structure and function is based on the results of Common Standards Monitoring visits where the habitat occurs as a feature. This is the only information confidently available across a sample of the resource. Fifteen SACs were assessed between 2007 and 2017, with 33% of the assessment made since 2012 (NRW, 2018) These results show that the large majority of the habitat on SACs in Wales (representing c. 9% of the total resource by area) is in unfavourable condition; as these have been selected as the best examples of the habitat and are more likely than most to be in good management, it seems likely that a majority of the resource is also in unfavourable condition. Unfavourable condition was due to a variety of factors. The difficulty of achieving a balance of light grazing or implementing a landscape scale approach to grazing management means that individual sites are often unfavourable for either tree regeneration or suitable conditions for lower plants. This tendency for mutual exclusivity may bias the assessments torwards unfavourable, and it is possible that if condition is assessed at a larger scale across a series of sites the outcome would be more favourable. Sites may often be unfavourable for structural reasons - even-aged canopies, lack of mature trees and deadwood - that are a result of umanaged regrowth following fellings for timber during the 20th century wars with subsequent abandonment. Presence of invasive species, typically Rhododendron are common, and may be a bigger problem outside of SACs where there is less vigilance and management activity.
6.3 Short term trend of habitat area in good condition; Period	For 14/15 sites where there has been reassessment between 2007 and 2017 (NRW, 2018), 2 have changed condition (representing 366.7 ha, 8% of total SAC area). However, it is unclear whether this is due to real change, or refinement of conservation objectives and methodology.
6.4 Short term trend of habitat area in good condition; Direction	One site has been assessed as having changed condition from Favourable to Unfavourable (330.0 ha) and one site site from Unfavourable to Favourable (31.4 ha) during this period. However, it is unclear whether this is due to real change, or refinement of conservation objectives and methodology.

7.1 Characterisation of pressures/ threats	Pressures: Four pressures were considered to have a high impact. Two of these relate to livestock grazing regime: A10, which involves insufficient grazing and A09 which relates to over-grazing. This apparently contradictory situation comes about because an intermediate level of grazing is required to provide suitable conditions for both rare species (bryophytes and lichens) and for tree regeneration, and this is hard to achieve practically. Ideally management should be considered (and coordinated) across a series of sites which collectively provide all required conditions, but not necessarily at the same time in the same place. J03 and A27 Air pollution appears to be a universal pressure, with all stands in areas where the Critical Load for nitrogen is exceeded coupled with more local impacts from agricultural activities. The impacts of nitrogen deposition and other forms of air pollution are poorly recorded in site monitoring and poorly reflected in NRW's Actions Database, but it is rated as high because of its comprehensive impact and because important bryophyte and lichen species of this habitat are likely to be especially sensitive to it. I02 Invasive non-native species are a widespread problem, especially Rhododendron ponticum which can colonise and dominate this habitat, and some conifer species such as western hemlock Tsuga heterophylla. Several pressures have been identified as Medium. D02 relates to the impacts of hydropower schemes which are increasingly being installed or proposed within steep water courses that are often associated with the habitat. The characteristic and rare biodiversity of the habitat (e.g. mosses and liverworts) are dependent on high humidity and this can be locally but significantly reduced by the diversion of water flows by these schemes; there are also impacts from habitat loss and fragmentation from built infrastructure (turbine houses, access tracks etc.). The habitat is affected by woodland management in a variety of ways (both positive and negative), and two specific codes have been selected as best representing management as a pressure. B04 relates to the ongoing loss of structural and ecological diversity that can arise from cessation of the diversity of long established traditional management practices, a process known as taxonomic homogenization (e.g. Keith et al., 2009); B12 relates to management interventions in inappropriate locations that are damaging because they break up examples of well developed natural structure. N09 'Other climate related changes in biotic conditions' has been included as a catch-all for the complex of interactions relating to long-term habitat loss, fragmentation, reduction of permeability of the matrix leading to reduced ecological connectivity, combined with the additional pressures of climate change that may require habitat range adaptation. They also interact with many of the specific climate change pressures that have been listed. These impacts are hard to quantify but likely to be ongoing and suggested here to be Medium (i.e. rather than high as entered for other woodland habitats such as Tilio Acerion) because the habitat's relatively high proportional area and good connectivity in Wales. Of the low pressures requiring further explanation, F07 'sports, tourism and leisure activities' refers notably to gorge walking, which although highly localised can be focussed on sites which are of particular importance for lower plants, and I04 which refers to impacts of deer which are currently very localised. Native (roe deer Capreolus capreolus) or long naturalised species (fallow deer Dama dama) are usually involved. Method used - pressures The assessment was based on the submission for 2012, reconsidered using expert knowledge updated accordingly for 2018. The data held in the \Actions Database\ were used to provide a basis for quantifying pressures/threats relating to Old sessile oakwood habitat, coupled with expert judgement on the severity of these pressures/threats (at a generic level) to give an overall evaluation of the pressure/threat level (for more details see Guest, 2012). For woodland, the Actions Database does not list Annex 1 habitats on SSSIs, so this analysis is based primarily on issues recorded on SACs, informed where possible by knowledge of the habitat on SSSIs elsewhere. Threats: The pressures identified above can be expected to remain. The polarisation of grazing impacts A10 / A09 may potentially get worse as there is no national grant scheme or mechanism to promote grazing at intermediate levels. I02 invasive species may well increase in abundance and additional species become a

	problem, possibly encouraged by climate change, although awareness of the problem is good and management is widespread. I05 remains a serious concern with the increase of tree pathogens in recent years, notably Phyophthora ramorum (Forestry Commission, 2018) and related species which potentially could have devastating effects on oak trees and Vaccinium (in the ground flora). I04 deer browsing is currently only a localised issue in Wales but experience from Scotland and England suggests that it could present a significant threat to the habitat as deer populations are likely to expand and increase in density, and may increasingly involve non-native species, particularly muntjac Muntiacus reevesi (I02/3?) Method used - threats: Expert opinion The pressures identified in pressures were used as a basis for threats, but additional information and expert opinion used to extrapolate to possible future impacts, and also to identify large scale issues such as those of climate change that are not evident on a site reporting basis.
8.1 Status of measures	While the majority of most important measures have been identified and taken, in reality some identified measures have not yet been taken while other interventions are needed but the mechanisms have not been resolved.
8.2 Main purpose of the measures taken	The majority of the most important measures currently being undertaken are focused on maintaining the structure and functions of existing stands of old sessile oakwood habitat. However several are also aimed at restoring the structure and functions both on individual sites and to the resource as a whole.
8.5 List of main conservation measures	CA05/CA06. These two measures relate to developing appropriate grazing regimes that deliver spatial and temporal variation in grazing intensity across the resource to accommodate the ecological requirements of both tree regeneration and the characteristic and rare species of the habitat. CJ01 Reduce impact of mixed source pollution. The impacts are probably high and significant on this habitat, but not clear what actions may be done locally to reduce in addition to national current regulation of air pollution, hence the Medium ranking assigned here. CI03 Management, control or eradication of other invasive alien species. INNS are widespread problem in Old sessile oakwood habitat, for example Rhododendron ponticum which can dominate extensive areas, and more locally species such as western hemlock Tsuga heterophylla. CC04 Reduce impact of hydropower operation and infrastructure. Activities generally relate to discouraging schemes in the most sensitive areas (for example through statutory powers) and developing mitigation through appropriate design elsewhere. CB05 Adapt/change forest management and exploitation practices CB06 Stop forest management and exploitation practices CB02 Maintain existing traditional forest management and exploitation practices CB03 Reinstate forest management and exploitation practices These measures relate to different aspects of the need to have appropriate management across the Old sessile oakwood resource to benefit the full-range of its dependent biodiversity, putting the right management in the right place. This means both active interventions where they promote structural diversity and other benefits, as well as minimum intervention where natural processes are operating well. CI07: Controlling and eradicating plant and animal diseases, pathogens and pests. This primarily relates to vigilance and the development of management and contingency plans to address the impacts of tree pathogens such as Phyophthora species. CN02 Implement climate change adaptation measures. This relates to the broad need to develop the resilience of the Old sessile oakwood resource beyond the individual site level, planning large scale ecological networks that provide functional connectivity for relevant species between protected sites that allows both mitigation for long-term habitat loss and fragmentation and the capacity for climate change adaptation (e.g. Watts et al., 2005; Latham et al. 2013). CF03 Reduce impact of outdoor sports, leisure and recreational activities. This is likely to be achieved through careful site and visitor management, through both regulation and awareness raising.

9.1 Future prospects of parameters	9.1a Future prospects of - range The habitat already has a very wide range in Wales, reflecting its environmental requirements. There may be potential for minor range increases, although these may be off-set by minor losses in suboptimal areas as climate change proceeds. 9.1b Future prospects of -area A general increase in woodland cover looks likely in Wales as it is supported by WG policy. In terms of native woodland types, Old sessile oakwood is especially likely to benefit as large areas of Wales may be environmentally appropriate for its establishment and there is a cultural predisposition towards oak and oak woodland (notwithstanding the potentially very long-time scales required to (re)create semi-natural woodland habitats). Significant gains in area of much higher ecological quality woodland is likely to come from restoring ancient woodland (PAWS) sites, again supported by WG policy. 9.1c Future prospects of - structure and function There are both positive and negative factors in operation with many uncertainties for the future, so it is not possible to form a confident opinion over whether either will prevail or whether they will cancel each other out overall leading to a stable future trend
11.3 Surface area of the habitat type inside the network; Method used	NVC maps exist for the majority of woodland SACs in Wales; surveys are described in Latham (2001) and digitised by GIS analysis (held on NRW GIS system). Areas of old sessile oakwood have previously been calculated for inclusion on JNCC's data forms: values for each of these for which the habitat is listed as a feature (grades A-D) were compiled, but then compared with habitat maps to re-assess the total area of old sessile oakwoods included on SACs rather than that originally mapped as a feature.
11.4 Short term trend of habitat area in good condition within the network; Direction	For 14/15 sites where there has been reassessment between 2007 and 2017 (NRW, 2018), 2 have changed condition (representing 366.7 ha, 8% of total SAC area). However, it is unclear whether this is due to real change, or refinement of conservation objectives and methodology.