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:

H9130 - *Asperulo-Fagetum* beech forests

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	**9130 - Asperulo-Fagetum beech forests**

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 2003. The Management of Native Woodlands. 2. Lowland Beech-Ash woodlands. Practice Guide. Forestry Commission, Edinburgh. 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. 9130 Asperulo-Fagetum beech forests http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H9130 [Accessed 21/06/18] Latham, J. 2000. Estimates of areas of woodland HSP types and HSD Annex 1 habitats in Wales. Unpublished CCW staff report. 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., Sherry, J. and 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. 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 for Habitat: H9130 - Asperulo-Fagetum beech forests. Available at: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/H9130_WALES.pdf [accessed 21/06/18] Natural Resources Wales (NRW). 2018. SAC and SPA Monitoring Programme Results 2013-2018. Available from: http://lle.gov.wales/catalogue/item/SACSPAMonitoringProgrammeResults/?lang

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=en [Accessed 19/0618)]
Watts, K., Griffiths, M., Quine, C., Ray, D. and Humphrey, J.W. 2005. Towards a Woodland Habitat Network for Wales. CCW Science Report 686, CCW Bangor.
Wilkinson, K. 2010. Cardiff Beech Woods SAC Monitoring Report. Asperulo-Fagetum beech forests (9130). April & May 2009. Monitoring Round 2 (2007-2012). DRAFT

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 13
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) 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:		

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5.15 Additional information

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	0.49	Maximum	0.49
	b) Area in not-good condition (km²)	Minimum	1.26	Maximum	1.26
	c) Area where condition is not known (km²)	Minimum	11.25	Maximum	11.25
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	2009-2015				
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
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	H
Problematic native species (I04)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Other climate related changes in abiotic conditions (N09)	M
Other invasive alien species (other then species of Union concern) (I02)	M
Thinning of tree layer (B12)	M
Abandonment of traditional forest management (B04)	M
Sports, tourism and leisure activities (F07)	M

Threat	Ranking
Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	H
Problematic native species (I04)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Other climate related changes in abiotic conditions (N09)	H
Other invasive alien species (other then species of Union concern) (I02)	M
Thinning of tree layer (B12)	M
Abandonment of traditional forest management (B04)	M

Sports, tourism and leisure activities (F07)	M
Droughts and decreases in precipitation due to climate change (N02)	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/manage extraction of non-energy resources (CC01)
Management of problematic native species (CI05)
Reduce impact of mixed source pollution (CJ01)
Implement climate change adaptation measures (CN02)
Management, control or eradication of other invasive alien species (CI03)
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)
Reduce impact of outdoor sports, leisure and recreational activities (CF03)

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

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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 1.75
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

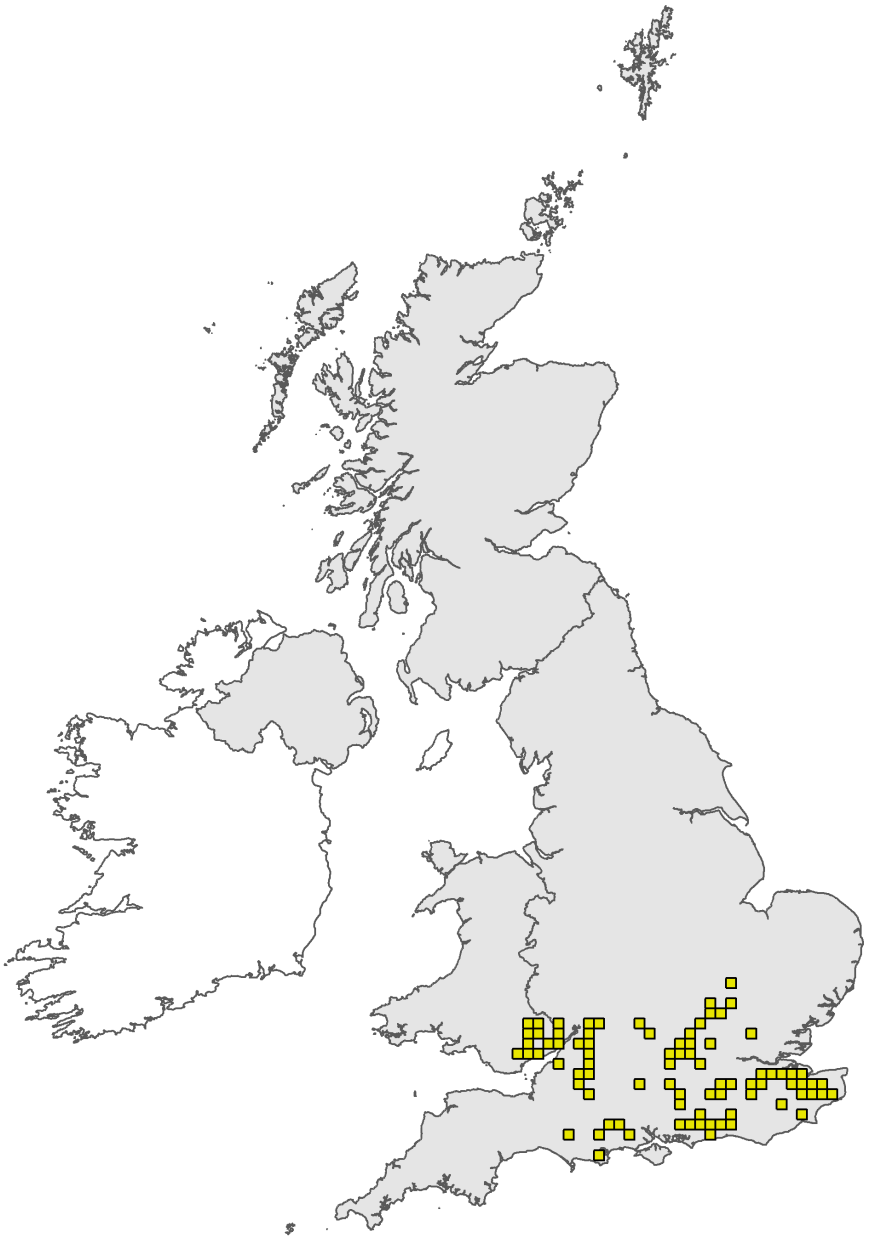

Figure 1: UK distribution map for H9130 - *Asperulo-Fagetum* beech forests. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 H9130 - *Asperulo-Fagetum* beech forests. 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: 9130

Field label	Note
2.1 Year or period	An extensive analysis of the range and extent of H9130 Asperulo-Fagetum beech forests 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 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	(Analysis as for 2012; see section 2.1). 9130 Asperulo-Fagetum beech forests are limited in range to the extreme south-east of Wales where beech is accepted as a native tree. Floristically similar stands do occur elsewhere in Wales where beech has been planted into base-rich woodlands (and some examples recorded as 'D' features on SACs), but these are not included in this analysis. Asperulo-Fagetum beech forests equate to NVC communities W12 and W14 on more base-rich soils (JNCC, 2017) and information on the habitats range can be derived from national NVC surveys in Wales. These are summarised in Latham (2001) and are fairly comprehensive at the scale required for reporting range and are considered adequate for the purpose. No additional significant information has become available since the last reporting round, and it is considered highly unlikely that the habitat has changed its range during this period. Previous estimates of the area of beech woodland in Wales (Latham 2000, 2003) have used a 'proportional representation' approach, calculating the proportion of the total area of woodland surveyed by national surveys that equates to Asperulo-Fagetum habitat and applying this proportion to figures for the total woodland area in Wales to estimate the total area of Asperulo-Fagetum. The approach makes the assumption that surveys are broadly representative of the overall woodland resource in Wales (Latham, 2001) and used CCW Phase 1 Habitat Survey for total resource figures (Blackstock et al., 2010). The current analysis uses this broad approach, but seeks to refine previous estimates by clarifying the native boundary of beech, and stratifying within it by broad rock types to help distinguish between beech woods of neutral-basic soils (Asperulo-Fagetum) and those of acid soils (Atlantic acidophilous beech forests). Beech is only considered native in southeast Wales. In the analysis for 'Priority Habitats of Wales' guidance for the Biodiversity Action Plan, Latham (2003) defined the range as \the former administrative counties of Gwent and the eastern halves of Mid and South Glamorgan, and a GIS boundary drawn informed by published maps, e.g. Forestry Commission (2003)\. The current analysis revisited that boundary layer, adjusting its location so that didn't divide woodland units and as far as possible kept to un-wooded areas; stands known to contain beech adjacent to the boundary were considered individually to make a judgment as to whether the beech was native or not. In reality, there is unlikely to be a hard boundary line for native beech, and a decreasing proportion of native beech abundance away from native core areas seems much more likely. However, it is far beyond the scope of the current analysis to take this into account and an informed but pragmatic boundary seemed the most reasonable way ahead. In the following, the area enclosed by this boundary is referred to as the 'beech zone'. The beech zone was stratified from British Geological Survey 1: 250,000 maps (licensed to CCW's MapInfo GIS) into: 1.) Rock types that generally weather to form base-rich to neutral soils (mainly including limestones and argillaceous rocks) likely to support a high abundance Asperulo-Fagetum beech forest, and; 2) Rock types that generally weather to form neutral to acidic soils (mainly sandstones) likely to support a lower abundance of Asperulo-Fagetum beech forest. A perfect separation of 'acid' and 'basic' beech types was not expected, but the hope was that it would help refine proportional estimates if the total areas of woodland on each broad rock types were unequal. The distinction was also intended to provide a consistent way of dealing with W14 Fagus sylvatica - Rubus fruticosus woodland which can be considered to be either Asperulo-Fagetum or Atlantic acidophilous beech forest depending on the details of its composition and associated woodland types: examples overlying base-rich rocks were considered to be Asperulo-Fagetum, those overlying acidic rock types to be Atlantic acidophilous beech forest. The total area of woodland ('Broadleaved' and 'Mixed, predominantly Broadleaved') within the beech zone, and overlying base-rich to neutral, and acidic rock types within it was calculated in GIS from the National Forest Inventory (NFI) (Forestry Commission, 2011). The total area of woodland surveyed with NVC (including W12 and W14) within each zone was taken from survey records (Latham, 2001). The total area of woodland overlying base-rich to neutral rock types in the beech zone was calculated as 9035.1 ha. Within this zone, 970.3 ha of woodland were

	surveyed with NVC, of which 85.1ha were W12 and 22.4ha as W14 (assumed to be Asperulo-Fagetum over these rock types), giving a proportion of (85.1+22.4)/970.3 = 0.1108. Applying this to the total woodland area = 9035.1 x 0.1108 = 1001ha. The total area of woodland overlying acidic to neutral rock types in the beech zone was calculated as 7132.7 ha. Within this zone, 733.3 ha of woodland were surveyed with NVC, of which 28.45ha were W12 (W14 is excluded as assumed to be Atlantic acidophilous beech forest over these rock types), giving a proportion of 28.45/733.3 = 0.0388. Applying this to the total woodland area = 7132.7 x 0.0388 = 278 ha. The totals for both rock types within the beech zone is 1001 + 278 = 1279ha. This figure has spurious precision, and a pragmatic estimate for the area of Asperulo-Fagetum beech forest in Wales is 1,300 ha, with a suggested range of 1,000 - 1,500ha (it is beyond the scope of this study to include formal errors).

Habitat code: 9130 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 Asperulo-fagetum beech forests 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 range 1985-2012. 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 H9130 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), and geological 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.
6.1 Condition of habitat	Area in Good - 0.49 km2 Area in Not-Good - 1.26 km2 Area not known - 11.25 km2 Figures adjusted from SDF by proportion based on reassessment of areas for 2013 submission.

6.2 Condition of habitat; Method used	Some assessment of structure and function can be made from the results of Common Standards Monitoring (NRW, 2018) where the habitat occurs as a feature on three SACs, representing c. 13% of the total resource. This is the only evidence source that confidently identifies this habitat. At the most recent assessment the majority of the habitat by area was in unfavourable condition (c. 78%), although 2/3 sites were assessed as Favourable overall. Unfavourable condition at the one site (which causes the dominance of the 'Unfavourable' result by area) was primarily due to the impacts of deer, limiting tree regeneration; other concerns relate to a variety of factors such as structural development, quarrying impacts and localised leisure activities, but these are not severe enough to cause other sites to be unfavourable. The overall condition of the habitat therefore may be closely linked to deer pressure which currently appears to be relatively localised. It's possible to speculate that condition across the wider resource may be generally good.
6.3 Short term trend of habitat area in good condition; Period	For the 3 sites that have been reassessed between 2007 and 2017, 1 has changed condition (representing c. 28% of total habitat area on SAC and c. 3% of the total resource). However, this is due to an improved understanding of the ecology of the site rather than real change (Wilkinson, 2010) and it is not possible to draw wider conclusions.
6.4 Short term trend of habitat area in good condition; Direction	One site has been assessed as having changed condition from Unfavourable to Favourable during this period. However, this is due to an improved understanding of the ecology of the site rather than real change (Wilkinson, 2010) and it is not possible to draw wider conclusions.

7.1 Characterisation of pressures/ threats	Pressures: Three pressures are ranked as High. I04 deer browsing ([predominantly by naturalised fallow deer Dama dama), has serious impacts on regeneration and composition, for example within the SAC sites in the Wye Valley. C01 extraction of rock through quarrying is a local, but serious pressure, which may result in total woodland loss as the habitat's limestone substrate is quarried away; there may also be effects of dust deposition and from modified hydrology. J03 Mixed source of air pollution, air-borne pollutants, appears to be universal with all areas in receipt of deposition rates for atmospheric nitrogen in excess of the critical load for the habitat, although the impacts for this habitat are largely unquantified. Several pressures were considered to have a medium impact. 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 good representation and connectivity within its range, and the expectation that its ecological range may expand with climate change. I02 Invasive non-native species are widespread, involving species such as Prunus laurocerasus cherry laurel. B12 and B04 relate to woodland management and the need for a balance of appropriate management across the resource. For example, an absence of intervention may result an even-aged structure with reduced structural diversity, whilst excessive or inappropriately located thinning can damage good structure from natural processes. However, these pressures may not be particularly well understood for this habitat as beech woodland can naturally have a uniform structure (pers. obs. from eastern European 'virgin' beech forests) and their significance may be exaggerated. F07 recreational activities (often illegal) can have important local impacts, causing damage to woodland ground flora regeneration and erosion. Method used - pressures The assessment was based on the submission for 2013 (NRW, 2013), reconsidered using expert knowledge and updated accordingly for 2018. The data held in the \Actions Database\ were used to provide a basis for quantifying pressures/threats relating to Asperulo-fagetum beechwood 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. I02 invasive species may well increase in abundance and additional species become a problem, possibly encouraged by climate change. 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?) I05 remains a serious concern with the increase of tree pathogens in recent years, notably Phyophthora ramorum and related species (Forestry Commission, 2018), some of which affect beech (Packham et al., 2012). However, none are currently known to be having a significant or widespread impact on beech in Wales. Ash is a minor component of the habitat and is expecting to significantly decline through the impacts of Chalara ash die-back. Perversely, a decline in ash trees could lead to the expansion of beech and expansion of Asperulo-fagetum habitat at the expense of ash woodland (including Tilio-Acerion) in the future. N02 'droughts and decreases in precipitation due to climate change' may generally have a negatively impact on beech woodland throughout its European range (Packham et al., 2012). However local losses may be more than off-set by the increase in climate-space for the habitat in Wales (e.g. Wesche et al., 2006). 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 Asperulo-fagetum beech forest 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	CC01 Adapt/manage extraction of non-energy resources. This largely relates to mitigating issues arising from proximity to limestone quarries through planning and negotiation. CI05: Management of problematic native species - the management of deer and their impacts. The long-term objective is to have populations of deer present at levels appropriate to their ecological situation, allowing them to deliver a positive ecosystem function. CJ01 Reduce impact of mixed source pollution. The impacts are probably high and significant on this habitat, but it is 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. CN02: Implement climate change adaptation measures. This relates to the broad need to develop the resilience of the Asperulo-fagetum beechwood 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, including planning for and facilitating the range expansion of beech where appropriate (e.g. Watts et al., 2005; Latham et al. 2013). CI03 Management, control or eradication of other invasive alien species. INNS are medium problem but a significant threat to Asperulo-fagetum habitat, and continued management, vigilance and contingency planning are required. 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 Asperulo-fagetum habitat 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. 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. 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.

9.1 Future prospects of parameters	9.1a Future prospects of - range. The habitat currently has limited range in Wales, being restricted to its accepted native range and appropriate soils. However, the climate-envelope for the habitat is likely to expand north and westwards with climate change (Wesche et al., 2006), giving some potential for range expansion on suitable soils both through colonisation and acceptance of the native status of habitat originating through beech planting. There may be simultaneous minor losses of habitat within its current range as conditions locally become too dry.9.1b Future prospects of - area On balance the future trend is considered to be positive. A general increase in woodland cover looks likely in Wales as it is supported by WG policy. This gives potential for Asperulo-fagetum beech forest to expand its area, facilitated by the expansion of its climate-envelope north and westwards with climate change, although the potential is tempered somewhat because base-rich soil types also become rarer to the north and west. There may be simultaneous minor losses of habitat within its current range as conditions locally become too dry. Significant gains in area are also likely to come from restoring ancient woodland (PAWS) sites, again supported by WG policy. Perversely, Asperulo-fagetum beech forest may benefit from the loss of ash trees to Chalara ash dieback, as it may replace ash trees leading to the progressive shift of some ash woodland types (W8, W9) to beech woodland (which is some case may involve the loss of Tilio-Acerion forests). 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.
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	Surface area - Estimation of habitat type surface area included in the SAC network: Minimum: 1.75 km2 Maximum: 1.75 km
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 Asperulo-fagetum beech forest 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 Asperulo-fagetum beech forest 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 the 3 sites that have been reassessed between 2007 and 2017 (NRW, 2018), 1 has changed condition (representing c. 28% of total habitat area on SAC). However, this is due to an improved understanding of the ecology of the site rather than genuine change, and the underlying condition is considered to be unchanged (Wilkinson, 2010).