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:

H9180 - Tilio-Acerion forests of slopes, screes and ravines

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	**9180 - Tilio-Acerion forests of slopes, screes and ravines**

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. Broome, A. & Mitchell, R.J. 2017. Ecological impacts of ash dieback and mitigation methods. FCRN029. Forestry Commission. Forestry Commission. 2011. National Forest Inventory Woodland Area Statistics: Wales: http://www.forestry.gov.uk/website/forestry.nsf/byunique/INFD-8EYJWF 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 Forestry Commission, 2018a. Chalara dieback of ash (Hymenoscyphus fraxineus). https://www.forestry.gov.uk/ashdieback [Accessed 23/07/18] Forestry Commission, 2018b. Emerald ash borer (Agrilus planipennis) https://www.forestry.gov.uk/emeraldashborer [Accessed 23/07/18] JNCC. 2017. Habitat account - Forests 9180 Tilio-Acerion forests of slopes, screes and ravines. http://jncc.defra.gov.uk/protectedsites/sacselection/habitat.asp?FeatureIntCode=H9180 [Accessed 23/07/18] 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., 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: an assessment for Article 17 Reporting, 2012. CCW Staff Report, Bangor. Latham, J. 2014. Woodland communities. In: Miller, H. (Ed). 2014. Ash die-back (Chalara fraxinea): potential impacts on biodiversity in Wales. Natural Resources Wales, Ty Cambria, Cardiff. R.J. Mitchell, R.L. Hewison, A.J. Hester, A. Broome & K.J. Kirby. 2016a. Potential impacts of the loss of Fraxinus excelsior (Oleaceae) due to ash dieback on woodland vegetation in Great Britain, New Journal of Botany, 6:1, 2-15, DOI: 10.1080/20423489.2016.1171454

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Mitchell. R.J., Pakeham, R.J., Broome, A., Beaton, J.K., Bellamy, P.E., Brooker, R.W., Ellis, C.J., Hester, A.J., Hodgetts, N.G., Iason, G.R., Littlewood, N.A., Pozgai, G., Ramsay, S., Riach, D., Stockan, J.A., Taylor, A.F.S. & Woodward, S. 2016b. How to Replicate the Functions and Biodiversity of a Threatened Tree Species? The Case of Fraxinus excelsior in Britain. Ecosystems (2016) 19: 573-586 DOI: 10.1007/s10021-015-9953-y

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: H9180 - Tilio-Acerion forests of slopes, screes and ravines (Wales). Available from: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/H9180_WALES.pdf [Accessed 23/06/ 2018]

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 19/06/2018]

Thomas, P.A. 2016. Biological Flora of the British Isles: Fraxinus excelsior. Journal of Ecology, List Vasc. Pl. Br. Isles (1992) no. 123, 2, 1 Doi: 10.1111/1365-2745.12566

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	30
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)			

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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:		
5.15 Additional information			

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	0.86	Maximum	0.86
	b) Area in not-good condition (km²)	Minimum	8.25	Maximum	8.25
	c) Area where condition is not known (km²)	Minimum	20.89	Maximum	20.89
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	Stable (0)				
6.5 Short-term trend of habitat area in good condition Method used	Based mainly on extrapolation from a limited amount of data				
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
Problematic native species (I04)	H
Other climate related changes in abiotic conditions (N09)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Thinning of tree layer (B12)	M
Abandonment of traditional forest management (B04)	M

Intensive grazing or overgrazing by livestock (A09)	M
Sports, tourism and leisure activities (F07)	M

Threat	Ranking
Problematic native species (I04)	H
Other climate related changes in abiotic conditions (N09)	H
Mixed source air pollution, air-borne pollutants (J03)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Thinning of tree layer (B12)	M
Abandonment of traditional forest management (B04)	M
Intensive grazing or overgrazing by livestock (A09)	M
Sports, tourism and leisure activities (F07)	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

Implement climate change adaptation measures (CN02)
Management of problematic native species (CI05)
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

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

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 9.11
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

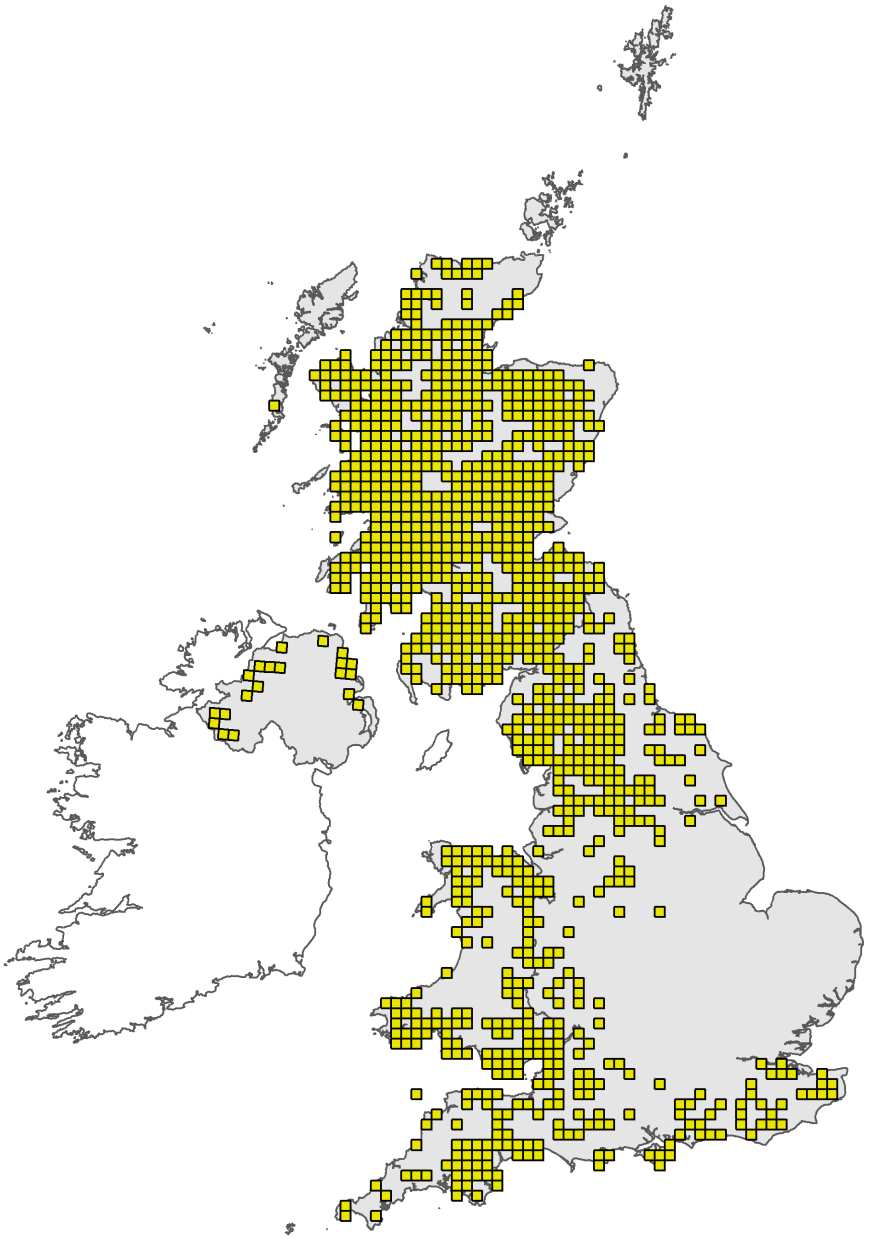

Figure 1: UK distribution map for H9180 - Tilio-Acerion forests of slopes, screes and ravines. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

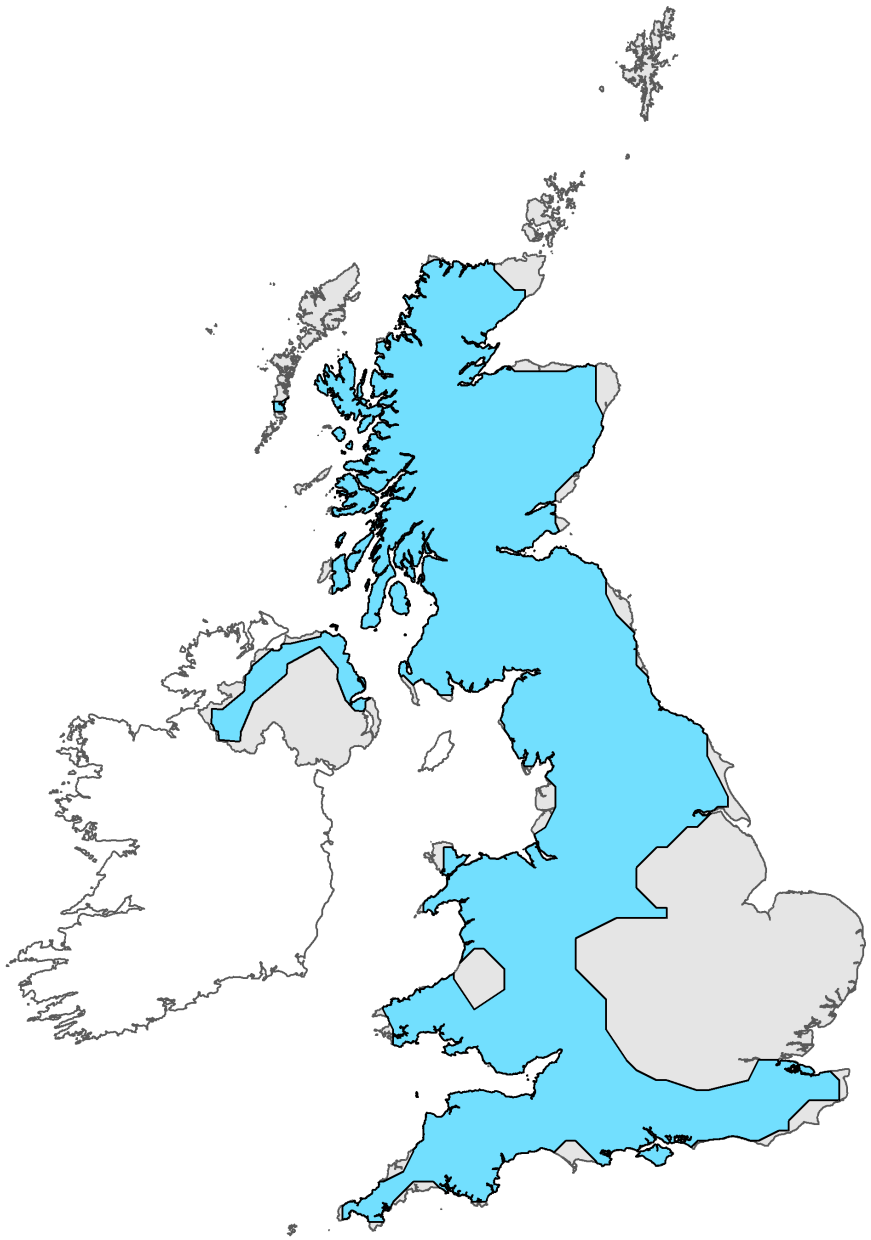

Figure 2: UK range map for H9180 - Tilio-Acerion forests of slopes, screes and ravines. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: 9180

Field label	Note
2.1 Year or period	An extensive analysis of the range and extent of Tilio-Acerion ravine woodland in Wales was carried out in 2012 using GIS, relevant vegetation surveys, geological and topographic 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

Tilio-Acerion forests of slopes, screes and ravines (hereafter referred to as \Tilio-Acerion\) have not been mapped directly by surveys in Wales, and these distribution and area estimates described below are derived from analysis of relevant vegetation surveys, geological and topographic data. 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. The problem in estimating areas and distribution of Tilio-Acerion is that whilst the habitat does in part correspond to particular NVC communities on base-rich substrates(W8d-g, W9), it strictly refers only to these communities on \coarse scree, cliffs, steep rocky slopes and ravines\ (JNCC, 2017); these NVC communities also occur on more level and non-rocky ground, but there are no definitions known as to how \steep\ or \rocky\ land has to be to support Tilio-Acerion. There is therefore a degree of subjectivity in what is recognised as Tilio-Acerion by different observers. A further problem is that woodland attributable to Tilio-Acerion varies at a small scale, sometimes of metres, with inclusions of Tilio-Acerion occurring on calcareous outcrops and cliffs within a matrix of non-Tilio-Acerion \upland ash woodland\ on gentler slopes and deeper soils. For these reasons total areas of Tilio-Acerion in Wales can only be estimated with low precision. An attempt was made to address these issues in a GIS analysis which considered two key factors i) the amount of woodland occurring on suitable substrates and, ii) the amount of this occurring on suitably steep slopes. Identifying suitable substrates for Tilio-Acerion Soil and geological datasets were investigated to see whether any particular mapped categories corresponded well with known examples of Tilio-Acerion. A good match was found with bedrock maps (British Geological Survey, GIS layers licensed to CCW), with records of Tilio-Acerion woodland being obviously associated with calcareous rock types, principally limestone. Seven broad rock types were selected from the bedrock layer with predominantly calcareous characteristics that supported semi-natural woodland, comprising a variety of limestone formations (including variants with minor interbedding of other types) and basic igneous rocks. These are hereafter referred to as core rock types There was a degree of uncertainty about the inclusion of argillaceous (clay rich) rocks which can often have a high base content and weather to form soils capable of supporting suitable woodland NVC types. However, they were excluded (unless mapped as comprising equal to sub-equal limestone) as these rock types are in general likely to weather to slopes with deep soils rather than crags, cliffs or screes characteristic of Tilio-Acerion. The approach is limited by the scale of the bedrock layer (produced at 1: 250,000) which does not feature fine detail, for example limestone interbedded within predominantly sandstone formations, and minor basic igneous dykes; some suitable rocks will also be obscured by drift deposits, though this is perhaps less of an issue on steep slopes and ravines than on more level ground. Despite this, the information was the best accessible for this analysis, and was considered adequate for broad national estimates of the area of Tilio-Acerion within its core distribution. Identifying suitable slope for Tilio-Acerion An analysis was carried out to determine what slope was required for woodland to be considered to be Tilio-Acerion. Digitised NVC maps (summarised in Latham, 2001) held on CCW's GIS system were used, with slope calculated trigonometrically from horizontal distance measured using MapInfo's ruler tool and vertical height change measured from 5m \Nextmap\ contour lines. Slope was calculated for a sample of woodland blocks previously identified as Tilio-Acerion throughout Wales during the SAC moderation process and subsequent monitoring, paired where possible with nearby blocks of woodland of similar NVC community but not identified as Tilio-Acerion. The results indicated that the majority of examples (>90%) recognised as Tilio-Acerion were on slopes > 20 degree ; similar NVC communities but not recognised as Tilio-Acerion usually occurred on slopes of < 10 degree . Few examples were found on intermediate slopes, (which perhaps reflects some underlying pattern in limestone topography in Wales) and a pragmatic cut-off of 15 degree is suggested. Estimating Tilio-Acerion abundance on suitable slopes over core rock types Maps of the total broadleaved woodland resource in Wales come from

	Forestry Commission's National Forest Inventory (NFI) (Forestry Commission, 2011), supplemented with Phase 1 Habitat Survey of Wales 1987 to 1997 (Blackstock et al., 2010). A GIS routine in MANIFOLD was carried out to select at a 10m pixel resolution all NFI \Broadleaved\ and \Mixed - predominantly broadleaved\ woodland overlaying base-rich rock types on slopes of =15 degree (2,900.4 ha) and =20 degree (1,724.26 ha), the two intervals are intended to give an indication of sensitivity of the final figure to slope variation. A pragmatic estimate from these two figures of \probable\ Tilio-Acerion of 2,400 ha. Examination of 1:10,000 OS maps of limestone areas familiar to the authors suggested that the analysis had been remarkably successful at mapping even quite small pockets of Tilio-Acerion. There are however various sources of error, notably replacement with beech woodland, which is sometimes planted in Tilio-Acerion situations; reference to mapped Phase 1 species codes suggested a total in the order of 400ha, bringing the Tilio-Acerion area estimate down to 2,000 ha. The error around this total figure is complex to estimate (and outwith the scope of the current analysis) but taking into account the conditions outlined above a pragmatic range of 1,800 - 2,500 ha is suggested (note that this isn't symmetrical around the 2,000ha total). Estimating Tilio-Acerion abundance not over core rock types Although Tilio-Acerion woodland occurs primarily within a heartland of core rock types, examples are also known throughout Wales where local conditions allow. These are typically small and often ill-defined inclusions within the broader upland ashwood type. As such, their total area is very hard to estimate, although it may well be significant in total. An attempt was made to estimate this area based on the proportion of woodland that could be assigned to Tilio-Acerion based on previous surveys (Latham, 2001). 732 survey samples were available outside the core base-rich rock types, of which a mean of 15.1% of the woodland area had been assigned to upland ashwood (W8d-g and W9). The NFI recorded a total of 111,470 ha of woodland (\broadleaved\ and \predominantly broadleaved\) from this area, implying a total of 16,832 ha of upland ashwood over non-core rock types. In order to estimate the proportion of upland ashwood that can be assigned Tilio-Acerion, a sample of 83 SSSIs for which relatively good data was available was investigated. These sites contained a mapped total of 454 ha of upland ashwood, of which 55 ha were considered \possible\ Tilio-Acerion. This suggests that around 12% of the 16,832ha upland ashwood in these areas could be referred to Tilio-Acerion, implying a total area of c. 2,000 ha. However, the data for these sites are very variable without a convincing distribution and including many 0% returns for Tilio-Acerion; in addition, much of this assumed Tilio-Acerion may be marginal in terms of representation of the habitat. A cautionary approach is therefore taken, and a \safe\ minimum figure of 1,000 ha of Tilio-Acerion not over core rock types is suggested. Total area of Tilio-Acerion in Wales A cautious estimate of the total area of Tilio-Acerion in Wales (combining estimates from both suites of rock types) is 3,000 ha, with a pragmatic suggested range of 2,800ha - 3,500 ha.

Habitat code: 9180 Region code: ATL

Field label	Note
4.11 Change and reason for change in surface area of range	The distribution of Tilio-Acerion 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 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 relevant vegetation surveys, geological and topographic data. 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.

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 topographic 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. The process involved a stratification of Wales into core (base-rich) rock types which principally hold Tilio-Acerion woodland, and predominantly non-basic rock types which has a more dispersed and minor representation of the habitat. Within core rock type areas, the area of NFI woodland cover over steep slopes was calculated; over non-core rock types the area of Tilio-Acerion was estimated from its inferred proportional representation within woodland surveys. A fuller description is given in 2.3 above and in Latham and Rothwell (2012).
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 wide time base, and their confidence errors are likely to be very much larger than any figures for ad hoc changes.
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 - 0.86 km2 Area in Not-Good - 8.25 km2 Area not known - 20.89km2 Figures adjusted from Standard Data form (SDF) by proportion based on reassessment if areas for 2013 submission.
6.2 Condition of habitat; Method used	Assessment of structure and function within SACs is based on the results of Common Standards Monitoring visits undertaken between 2007 and 2017 on 12 sites where Tilio-Acerion is a feature (grade C or above) (NRW, 2018); of these 10/12 (83%) were undertaken between 2012 and 2017. These results show that the majority of examples (9/12 sites, 75%) and area (91%) of the habitat on SACs in Wales (representing c. 30% of the total resource by area) are currently 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, frequently including lack of regeneration (due to deer or livestock grazing), invasive species and canopy composition, and structural attributes such as a lack of a mature canopy, shrub layer or deadwood. On the positive side, little evidence was found of actual habitat loss, suggesting that habitat area is stable, at least within SACs.
6.3 Short term trend of habitat area in good condition; Period	For 11/12 sites where there has been reassessment between 2007 and 2017, only 1 has changed condition (representing 44.1 ha, 4% of total SAC area). However, it is unclear whether this is due to real change, or refinement of conservation objectives.
6.4 Short term trend of habitat area in good condition; Direction	For 11/12 sites where there has been reassessment between 2007 and 2017, only 1 has changed condition (unfavourable to favourable). However, it is unclear whether this is due to real change, or refinement of conservation objectives.

7.1 Characterisation of pressures/ threats

Pressures: A new pressure affecting Tilio-Acerion woodland since the 2012 assessment is Chalara dieback of ash via the fungus (Hymenoscyphus fraxineus) I05. This is currently only graded as Medium because of the perceived level of impact so far, but this is a significant change with far reaching ecological consequences for the habitat likely from mortality of ash trees which are a critical component of Tilio-Acerion in Wales (Mitchell, et al. 2016a; Broome & Mitchell, 2017). As of July 2018, the disease has been confirmed within 79.6% of 10km squares in Wales (Forestry Commission, 2018a). This is a minimum distribution as it reflects sampling rather than actual distribution. It is documented and impacting on several SACs (e.g. Cernydd Carmel, Alyn Valley, Lower Wye Valley), and it is a reasonable assumption that it is comprehensibly present across the range of the habitat. Four pressures have been ranked as high. I02 Invasive non-native species are widespread problem and involve a wide-range of species such as shrubs e.g. cherry laurel Prunus laurocerasus, trees e.g. beech Fagus sylvatica outside its native range, and a variety of conifer species, and ground flora, e.g. periwinkle Vinca minor and Himalayan balsam Impatiens glandulifera. The last of these is apparently expanding within woodland rather than being restricted to its more typical riverside habitat. I04 Deer browsing. This is predominantly by fallow deer (Dama dama) which are naturalised in the UK, but also with some impact from native roe deer (Capreolus capreolus) and non-native species such as muntjac (Muntiacus reevesi) (note: this is included under this code as the best fit, but is not ideal) is having severe impacts on the composition, function and structure of two SACs designated for this habitat. J03 air pollution is also assumed to be having a high impact as 100% of the habitat is found in areas where nitrogen deposition exceeds Critical Load. The actual effects are hard to establish and may be compounded with the long-term effects of other pressures. 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. These impacts are hard to quantify but likely to be ongoing and high. They also interact with many of the specific climate change pressures that have been listed. Several pressures have been identified as Medium. 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 long established traditional management practices (which may include coppicing), a process known as taxonomic homogenization (e.g. Keith et al., 2009). B12 relates to inappropriate management interventions within examples of habitat that have well developed natural structure, or where management activities may be damaging because of disturbance to the steep and rocky substrate. F07 access by foot or motor vehicles is locally a serious problem. C01 quarrying locally causes loss of Tilio-Acerion which occurs on economically valuable limestone; there may also be impacts of quarry dust on vegetation. However, these effects are hard to quantify and will not be picked up by recording processes of the Actions Database (see below) or by site monitoring. A range of additional pressures are noted (B07, D02, B20 and J04) but considered of low significance. Method used - pressures: The data held in the 'Actions Database' were used to provide a basis for quantifying pressures/threats relating to Tilio-Acerion habitat for the 2013 assessment. These have been reviewed for the 2018 assessment, bringing in new information where possible from SAC monitoring and other site reports and communications, as well as from inferences and support from other research and information where relevant. The 'Actions Database' provides information on pressures within the protected sites series, this was then matched to an 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. SACs hold an estimated 911 ha of Tilio-Acerion in Wales, which is roughly 30% of the resource and includes the largest examples. Threats: Most of the pressures identified above can be expected to remain as threats. The impacts of Chalara are likely to become very much worse, and this must be seen as a key threat to the habitat. There is hope that genotypes of ash may be present in Wales that are resistant to the disease, and there may be opportunities to build the resilience of the Tilio-Acerion resource by promoting other tree species (Mitchell et al. 2016b), although this generates new threats to the ecological integrity of the habitat. There have been preliminary attempts to identify the relative vulnerability of woodland protected sites in Wales based on their relative dependency on ash (Latham, 2014). A related threat is B07, removal of trees killed by Chalara which may be perceived as convenient source of firewood, as this may cause extensive disruption to Tilio-Acerion habitats Another threat is the emerald ash borer Agrilus planipennis which is not yet present in Britain, but presents another serious threat to ash trees and Tilio-Acerion habitat (Forestry Commission, 2018b) Deer populations are likely to increase, both in density and range, leading to increased impacts on this habitat. Tilio-Acerion is a highly fragmented habitat in Wales, and the effects of low connectivity may be expected to intensify with climate change and the need for species to adjust their ranges in the landscape. 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 already 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 Tilio-Acerion. 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	CI07: Controlling and eradicating plant and animal diseases, pathogens and pests. This primarily relates to developing management and contingency plans to address the impacts of Chalara, (although little can be done to eradicate the pathogen). We are not currently able to use this conservation measure for internal UK reporting and for that purpose have considered the measures to be covered under the definition of CI03: Management, control or eradication of other invasive alien species. CN02: Implement climate change adaptation measures. This relates to the broad need to develop the resilience of the Tilio-Acerion 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). 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 that reflect their ecological situation, allowing them to deliver a positive ecosystem function. CI03: Management, control or eradication of other invasive alien species. INNS are widespread problem in Tilio-Acerion habitat, involving a wide-range of species such as shrubs e.g. cherry laurel Prunus laurocerasus, trees e.g. beech Fagus sylvatica outside its native range, and variety of conifer species, and ground flora, e.g. periwinkle Vinca minor and Himalayan balsam Impatiens glandulifera. 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 Tilio-Acerion 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. These activities have locally significant impacts. CC01: Adapt/manage extraction of non-energy resources. This largely relates to mitigating issues arising from proximity to limestone quarries. CB09: Manage the use of chemicals for fertilisation, liming and pest control in forestry. Locally significant, especially in relation to neighbouring land uses. CJ03: Reduce impact of mixed source pollution. The impacts are probably high, but not clear what actions may be done locally to reduce in addition to national current regulation of air pollution, hence the lower ranking assigned here.
9.1 Future prospects of parameters	9.1a future prospects of - range See 9.1b. 9.1b Future prospects of -area The overall area of Tilio-Acerion looks likely to decrease given the high probability of major loss of ash, the key canopy component and determinant of the ecological characteristics of the habitat in Wales. Woodland of some sort is generally likely to continue to exist within the same area, but it is open to question how far it could be classified as Tilio-Acerion in the absence of ash or other characteristic species. On the positive side, a general increase in woodland cover looks likely in Wales as it is supported by WG policy: this at least offers the potential to expand (or mitigate the loss of) Tilio-Acerion habitat in the long term, although Tilio-Acerion may not benefit especially because of the relatively scarcity of suitable planting sites which are likely to be either restricted due to the relative scarcity of sites which have the right geology and topography and aren't occupied by other habitats of high conservation value (e.g. calcareous grassland). Gains in area may come from restoring ancient woodland (PAWS) sites 9.1c Future prospects of -structure and function Ash has very specific ecological functional characteristics (Mitchell et al., 2016a; Thomas, 2016), and a large-scale loss of this species is likely to have serious impacts on the structure and function of Tilio-Acerion. Coupled with expanding deer populations and continuing impacts of aerial deposition, the future prospects are bleak.

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	Best single value: 9.11 km2
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 for GIS analysis. Areas of Tilio-Acerion have previously been calculated for inclusion on JNCC's data forms: values for each of these for which Tilio-Acerion is listed as a feature (grades A-D) were compiled, but then compared individually with habitat maps and topographic data to re-assess the total area of Tilio-Acerion included on SACs.
11.4 Short term trend of habitat area in good condition within the network; Direction	For 11/12 SAC sites where there has been reassessment between 2007 and 2017, only 1 has changed condition (unfavourable to favourable) (NRW, 2018). However, it is unclear whether this is due to real change, or refinement of conservation objectives.