Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A

2019-2024

Conservation status assessment for the habitat:

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

Wales

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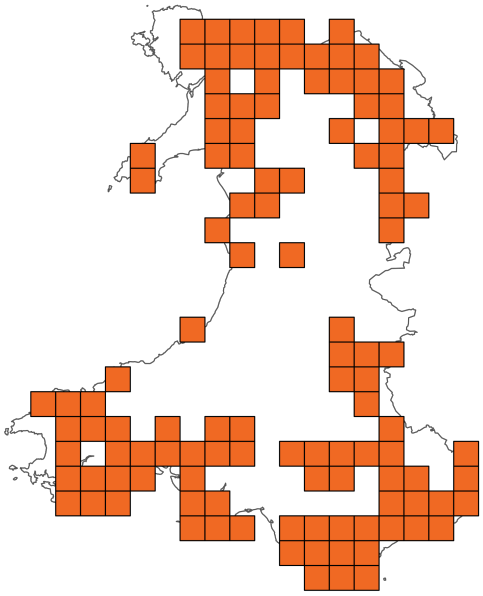
Important note - Please read

- The information in this document represents Wales Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A, for the period 2019-2024.
- It is based on supporting information provided by Natural Resources Wales, which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the habitat are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country reports.
- 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 not relevant to this habitat (section 11 National Site Network coverage for Annex I habitats).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

Assessment Summary: *Tilio-Acerion* forests of slopes, screes and ravines

Distribution Map



Range Map

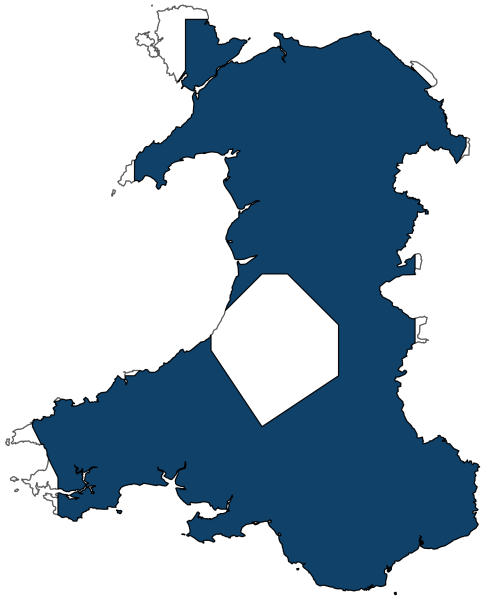


Figure 1: Wales distribution and range map for H9180 - *Tilio-Acerion* forests of slopes, screes and ravines. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available habitat records within the current reporting period.

Table 1: Table summarising the conservation status for H9180 - *Tilio-Acerion* forests of slopes, screes and ravines. Overall conservation status for habitat is based on assessments of range, area covered by habitat, structure and functions, and future prospects.

Overall Conservation Status (see section 10)

Unfavourable-bad (U2)

Breakdown of Overall Conservation Status

Range (see section 4)	**Favourable (FV)**
Area covered by habitat (see section 5)	**Unfavourable-inadequate (U1)**
Structure and functions (see section 6)	**Unfavourable-bad (U2)**
Future prospects (see section 9)	**Unfavourable-bad (U2)**

List of Sections

National Level

1. General information

1.1 Country	Wales
1.2 Habitat code	H9180 - *Tilio-Acerion* forests of slopes, screes and ravines

2. Maps

2.1 Year or period	1985-2012
2.2 Distribution map	Yes
2.3 Distribution map; Method used	Based mainly on extrapolation from a limited amount of data

2.4 Additional information

No additional information

Biogeographical Level

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs ATL

3.2 Sources of information

See section 13 References

4. Range

4.1 Surface area (km²)	18,201.3
4.2 Short-term trend; Period	2013-2024
4.3 Short-term trend; Direction	Stable
4.4 Short-term trend; Magnitude	

a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
4.5 Short-term trend; Method used	Based mainly on expert opinion with very limited data
4.6 Long-term trend; Period	
4.7 Long-term trend; Direction	
4.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	
4.9 Long-term trend; Method used	

4.10 Favourable Reference Range (FRR)

a) Area (km²)	
b) Pre-defined increment	Current range is less than 2% smaller than the FRR
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

4.11 Change and reason for change in surface area of range

a) Change	No
b) Genuine change	

c) Improved knowledge or more accurate data	
d) Different method	
e) No information	
f) Other reason	
g) Main reason	

4.12 Additional information

No additional information

5. Area covered by habitat

5.1 Year or period	1985-2012
5.2 Surface area (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	
5.6 Short-term trend; Direction	Unknown
5.7 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
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	
d) Rate of decrease	
5.12 Long-term trend; Method used	
5.13 Favourable Reference Area (FRA)	
a) Area (km²)	
b) Pre-defined increment	Current area is between 2% and 10% smaller than the FRA
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

5.14 Change and reason for change in surface area of range

a) Change	No
b) Genuine change	
c) Improved knowledge or more accurate data	
d) Different method	
e) No information	
f) Other reason	
g) Main reason	

5.15 Additional information

No additional information

6. Structure and functions

6.1 Condition of habitat (km²)	
Area in good condition	
ai) Minimum	0.86
aii) Maximum	0.86
Area not in good condition	
bi) Minimum	8.25
bii) Maximum	8.25
Area where condition is unknown	
ci) Minimum	20.89
cii) 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	2013-2024
6.4 Short-term trend of habitat area in good condition; Direction	Stable
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

Typical species were not used directly in the assessment of conservation status for habitat structure and function as a comprehensive list of typical species for each habitat

was not available. However, the status of typical species was considered when the condition of individual sites was assessed using Common Standards Monitoring Guidance. Common Standards Monitoring (CSM) data was used to assess the area of habitat in ‘good’ and ‘not good’ condition (field 6.1). Species were a component of the attributes assessed under CSM. Therefore, an assessment of species is considered to have formed part of the reporting under field 6.1 which supported the Habitats Structure and Function assessment (field 10.3).

7. Main pressures

7.1 Characterisation of pressures

Table 2: Pressures affecting the habitat, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
PI04: Plant and animal diseases, pathogens and pests	Ongoing and likely to be in the future	High (H)
PI03: Problematic native species	Ongoing and likely to be in the future	High (H)
PJ14: Other climate related changes in abiotic conditions	Ongoing and likely to be in the future	High (H)
PK03: Mixed source air pollution, air-borne pollutants	Ongoing and likely to be in the future	High (H)
PK04: Atmospheric N-deposition	Ongoing and likely to be in the future	High (H)
PI02: Other invasive alien species (other than species of Union concern)	Ongoing and likely to be in the future	High (H)
PB06: Logging or thinning (excluding clear cutting)	Ongoing and likely to be in the future	Medium (M)
PB04: Abandonment of traditional forest management	Ongoing and likely to be in the future	Medium (M)
PA07: Intensive grazing or overgrazing by livestock	Ongoing and likely to be in the future	Medium (M)
PF05: Sports, tourism and leisure activities	Ongoing and likely to be in the future	Medium (M)

7.2 Sources of information

See section 13 References

7.3 Additional information

No 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, surface area or structure and functions of the habitat type
8.3 Location of the measures taken	Both inside and outside National Site Network
8.4 Response to measures	Medium-term results (within the next two reporting periods, 2025–2036)

8.5 List of main conservation measures

Table 3: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
MI06: Controlling and eradicating plant and animal diseases, pathogens and pests	High (H)
MJ02: Implement climate change adaptation measures	High (H)
MI05: Management of problematic native species	High (H)
MI03: Management, control or eradication of other invasive alien species	High (H)
MK01: Reduce impact of mixed source pollution	Medium (M)
MC09: Manage/reduce/eliminate air pollution from resource exploitation and energy production	Medium (M)

MA11: Reduce/eliminate air pollution from agricultural activities	Medium (M)
MB05: Adapt/change forest management and exploitation practices	Medium (M)
MB06: Stop forest management and exploitation practices	Medium (M)
MB02: Maintain existing traditional forest management and exploitation practices	Medium (M)
MB03: Reinstate forest management and exploitation practices	Medium (M)
MF03: Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	Medium (M)

8.6 Additional information

No additional information

9. Future prospects

9.1a Future trends of parameters

ai) Range	Negative - decreasing <=1% (one percent or less) per year on average
bi) Area	Negative - decreasing <=1% (one percent or less) per year on average
ci) Structure and functions	Very negative - important deterioration

9.1b Future prospects of parameters

aii) Range	Poor
bii) Area	Poor
cii) Structure and functions	Bad

9.2 Additional information

No additional information

10. Conclusions

10.1 Range	Favourable (FV)
10.2 Area	Unfavourable-inadequate (U1)
10.3 Specific structure and functions (incl. typical species)	Unfavourable-bad (U2)
10.4 Future prospects	Unfavourable-bad (U2)
10.5 Overall assessment of Conservation Status	Unfavourable-bad (U2)
10.6 Overall trend in Conservation Status	Stable

10.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

10.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

10.8 Additional information

No additional information

11. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (km^2)

a) Minimum	
b) Maximum	
c) Best single value	9.11

11.2 Type of estimate	Best estimate
11.3 Habitat area inside the network; Method used	Complete survey or a statistically robust estimate
11.4 Short-term trend of habitat area within the network; Direction	Stable
11.5 Short-term trend of habitat area within the network; Method used	Complete survey or a statistically robust estimate
11.6 Short-term trend of habitat area in good condition within the network; Direction	Decreasing
11.7 Short-term trend of habitat area in good condition within the network; Method used	Based mainly on extrapolation from a limited amount of data

11.8 Additional information

No additional information

12. Complementary information

12.1 Justification of percentage thresholds for trends

No justification information

12.2 Other relevant information

No other relevant information

13. References

Biogeographical and marine regions

3.2 Sources of information

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Main pressures

7.2 Sources of information

No sources of information

14. Explanatory Notes

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 at the time of this analysis), 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°; similar NVC communities but not recognised as Tilio-Acerion usually occurred on slopes of < 10°. 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° 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° (2,900.4 ha) and =20°

(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 out with 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 ash wood 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 ash wood (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 ash wood over non-core rock types.

	In order to estimate the proportion of upland ash wood 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 ash wood, of which 55 ha were considered ”possible” Tilio-Acerion. This suggests that around 12% of the 16,832ha upland ash wood 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.
5.1: Year or period	Total evidence range 1985 - 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.
5.8: 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	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 2013 and 2024 on 12 sites where Tilio-Acerion is a feature (grade C or above) (NRW, 2018); of these nine (75%) were undertaken between 2013 and 2024. 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 nine sites where there has been reassessment between 2013 and 2024, 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 nine sites where there has been reassessment between 2013 and 2024, 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	Pressures: A new pressure affecting Tilio-Acerion woodland since the 2012 assessment is Chalara dieback of ash via the fungus (Hymenoscyphus fraxineus) PI04. This is graded as High because of Chalara now affects Tilio-Acerion in every 10-km square in Wales where the habitat occurs. This is a significant change with far reaching ecological consequences for the habitat, from the mortality of ash trees which are a critical component of Tilio-Acerion in Wales (Mitchell, et al. 2016a; Broome & Mitchell, 2017). In July 2018, the disease has been confirmed within 79.6% of 10km squares in Wales (Forestry Commission, 2018a). This figure has increased and is presumed to be 100% of all 10-km squares where ash occurs. It is documented as impacting on all SACs where monitoring took place, and it is a reasonable assumption that it is comprehensibly present across the entire range of the habitat. Five pressures have been ranked as high. PI02 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 invasive non-native 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. PI03 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.

PK04 Atmospheric N-deposition and PK03 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. There will be negative impacts no associated lower plant floras and potentially on the vascular plant field layers.

PJ14 '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.

PB04 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).

PB06 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.

PF05 access by foot or motor vehicles is locally a serious problem.

PC01 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 (PB07, PD06, PD02, PB17 and PK05) 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 has become very much worse, and is 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 PB07, 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. Future developments such as cabling and pylon routes for energy infrastructure projects could potentially impact on the current extent and future expansion of Tilio-Acerion. But Welsh Governments Planning Policy Wales 12 currently affords ancient woodland irreplaceable habitat status and some protection form future development and the scale of such impacts must be considered low.

	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	MI06: 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). Welsh Government has issued a strategy regarding Ash die-back (Chalara), closely followed by externally facing guidance from NRW. MJ02: 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).

MI05: 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.

MI03: 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 invasive non-native conifer species, and ground flora, e.g. periwinkle Vinca minor and Himalayan balsam Impatiens glandulifera.

MK01: Reduce impact of mixed source pollution.

MA11: Reduce/eliminate air pollution from agricultural activities

MC09: Manage/reduce/eliminate air pollution from resource exploitation and energy production

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.

There are various air quality strategies and initiatives in place to protect and enhance biodiversity. Air quality limit values set out in the Air Quality Strategy (AQS) are transposed into national legislation by the Air Quality Standards Regulations 2010. Nitrogen deposition continues to impact semi-natural habitats in Wales. These regulations are not habitat-specific, however with introduction of The Environment (Air Quality and Soundscapes) (Wales) Act 2024 in Wales, brings in new national targets for air quality

pollutants, with the potential of directly influencing habitat protection.

This key legislative advancement requires mandatory targets for fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) to be established by February 2027, including new powers for Welsh Ministers to set pollutant-specific targets in future years (e.g., ammonia, nitrogen dioxide) linked to biodiversity outcomes, potentially enabling future habitat-sensitive thresholds.

Welsh Government have also introduced The Agriculture (Wales) Act in 2023. It aims to establish a framework of Sustainable Land Management (SLM) objectives to underpin agricultural support, including the Sustainable Farming Scheme (SFS). The Act provides Welsh Ministers with the power to provide support (financial or otherwise) for or in connection with 15 purposes, including 'Improving air quality'. Welsh Government published a consultation on the SFS which closed in March 2024. Welsh Ministers will not be making final scheme design decisions until further stakeholder work is undertaken.

MB05: Adapt/change forest management and exploitation practices

MB06: Stop forest management and exploitation practices

MB02: Maintain existing traditional forest management and exploitation practices

MB03: 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. MF03: Reduce impact of outdoor sports, leisure and recreational activities. These activities have locally significant impacts. MC01: Adapt/manage extraction of non-energy resources (low rank). This largely relates to mitigating issues arising from proximity to limestone quarries. MB09: Manage the use of chemicals for fertilisation, liming and pest control in forestry (low rank). Locally significant, especially in relation to neighbouring land uses.
9.1:Future trends and prospects of parameters	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. However, there is optimism in some locations due to the presence of what appears to be Chalara-resistant forms of Ash. There may be potential for future recolonisation by disease-resistant strains. Also the characteristic ground floras of Tilio-Acerion are persisting beneath diseased trees, allowing characterisation of H9180. 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 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 potentially bleak. The Future prospects for Structure and functions takes into account that at least 25% of the habitat area is expected to be in unfavourable (not good) condition in c.2035 due to nutrient N critical load exceedance, unless additional measures are taken to reduce N deposition impacts.
10.1: Range	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable; and (ii) the current Range surface area is approximately equal to the Favourable Reference Range.
10.2: Area	Conclusion on Area reached because:(i) the short-term trend direction in Area is unknown; (ii) the current Area is not more than 10% below the Favourable Reference Area and iii) there has been no significant change in distribution pattern within range
10.3: Specific structure and functions	Conclusion on Structure and function reached because: i) habitat condition data indicates that more than 25% of the habitat is in unfavourable (not good) condition; ii) short-term trend in area of habitat in good condition is stable; and iii) expert opinion determines that there are significant issues for this habitat
10.4: Future prospects	Conclusion on Future prospects reached because: (i) the Future prospects for Range are poor; (ii) the Future prospects for Area covered by habitat are poor; and (iii) the Future prospects for Structure and function are bad.

10.5: Overall assessment of Conservation Status	Overall assessment of Conservation Status is Unfavourable-bad because two of the conclusions are Unfavourable-bad.
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 within the network; Direction	For the nine 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.
5.13: Favourable Reference Area (FRA)	The UK-level FRV for surface area was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current habitat extent and trends.
4.10: Favourable Reference Range (FRR)	The UK-level FRV for range was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current distribution and trends.