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:

H91E0 - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

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	**91E0 - Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padio**

2. Maps

2.1 Year or period	2006-2011
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. Dargie, T. and Dargie, J. 1998. An inventory and conservation review of coastal grazing marsh and floodplain habitats in Wales. Stage 1, inventory. CCW Science Report, 274. Environment Agency 2004. Flood Zones for England. Issued by Flood Mapping Programme, Environment Agency, Rio House, Bristol. Forestry Commission 2011. National Forest Inventory Woodland Area Statistics: Wales: http://www.forestry.gov.uk/website/forestry.nsf/byunique/INFD-8EYJWF Forestry Commission 2018a. Top tree diseases Phytophthora alni. https://www.forestry.gov.uk/palni [Accessed 21/06/18] Forestry Commission, 2018b. Chalara dieback of ash (Hymenoscyphus fraxineus). https://www.forestry.gov.uk/ashdieback [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. 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. & Rothwell, J. 2012. Estimates of the area and distribution of woodland Annex 1 types in Wales based on GIS analyses. CCW Staff Report, CCW Bangor. 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: H91E0: Alluvial forests with Alnus glutinosa and Fraxinus excelsior

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(Alno-Padion, Alnion Incanae, Salicion albae) Available from: http://jncc.defra.gov.uk/pdf/Article17/FCS2007-H91E0-audit-final.pdf [accessed 19/06/18]
Natural Resources Wales (NRW). 2018. SAC and SPA Monitoring Programme Results 2013-2018. Available from: http://lle.gov.wales/catalogue/item/SACSPAMonitoringProgrammeResults/?lang=en [Accessed 19/0618)]
Peterken, G.F. & Hughes, F.M.R. 1995. Restoration of floodplain forests in Britain. Forestry 63 (3): 187-202.
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.
Welsh Government 2017. Natural Resources Policy. https://gov.wales/docs/desh/publications/170821-natural-resources-policy-en.PDF [Accessed 21/06/18]
JNCC 2017. Habitat account - Forests. 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) http://jncc.defra.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H91E0 [Accessed 21/06/18]

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	2006-2011			
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)			
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			

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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	0.285	Maximum	0.285
	b) Area in not-good condition (km²)	Minimum	4.07	Maximum	4.07
	c) Area where condition is not known (km²)	Minimum	25.65	Maximum	25.65
6.2 Condition of habitat Method used	Based mainly on expert opinion with very limited data				
6.3 Short-term trend of habitat area in good condition Period	2005-2017				
6.4 Short-term trend of habitat area in good condition Direction	Unknown (x)				
6.5 Short-term trend of habitat area in good condition Method used	Insufficient or no data available				
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period?		No		
6.7 Typical species Method used					
6.8 Additional information					

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Modification of hydrological flow or physical alteration of water bodies for agriculture (excluding development and operation of dams) (A33)	H
Conversion into agricultural land (excluding drainage and burning) (A01)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Other climate related changes in abiotic conditions (N09)	M
Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01)	M

Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F03)	M
Mixed source air pollution, air-borne pollutants (J03)	M
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	M

Threat	Ranking
Modification of hydrological flow or physical alteration of water bodies for agriculture (excluding development and operation of dams) (A33)	H
Conversion into agricultural land (excluding drainage and burning) (A01)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Other climate related changes in abiotic conditions (N09)	M
Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01)	M
Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F03)	M
Mixed source air pollution, air-borne pollutants (J03)	M
Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	M
Problematic native species (I04)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken
8.2 Main purpose of the measures taken		Maintain the current range, population and/or habitat for the species
8.3 Location of the measures taken		Both inside and outside Natura 2000
8.4 Response to the measures		Medium-term results (within the next two reporting periods, 2019-2030)

8.5 List of main conservation measures

Manage drainage and irrigation operations and infrastructures in agriculture (CA15)
Restoration of Annex I forest habitats (CB08)
Management, control or eradication of other invasive alien species (CI03)
Implement climate change adaptation measures (CN02)
Reduce impact of mixed source pollution (CJ01)

8.6 Additional information

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9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

10. Conclusions

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

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

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum b) Maximum c) Best single value 4.35
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	Unknown (x)
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	

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Distribution Map

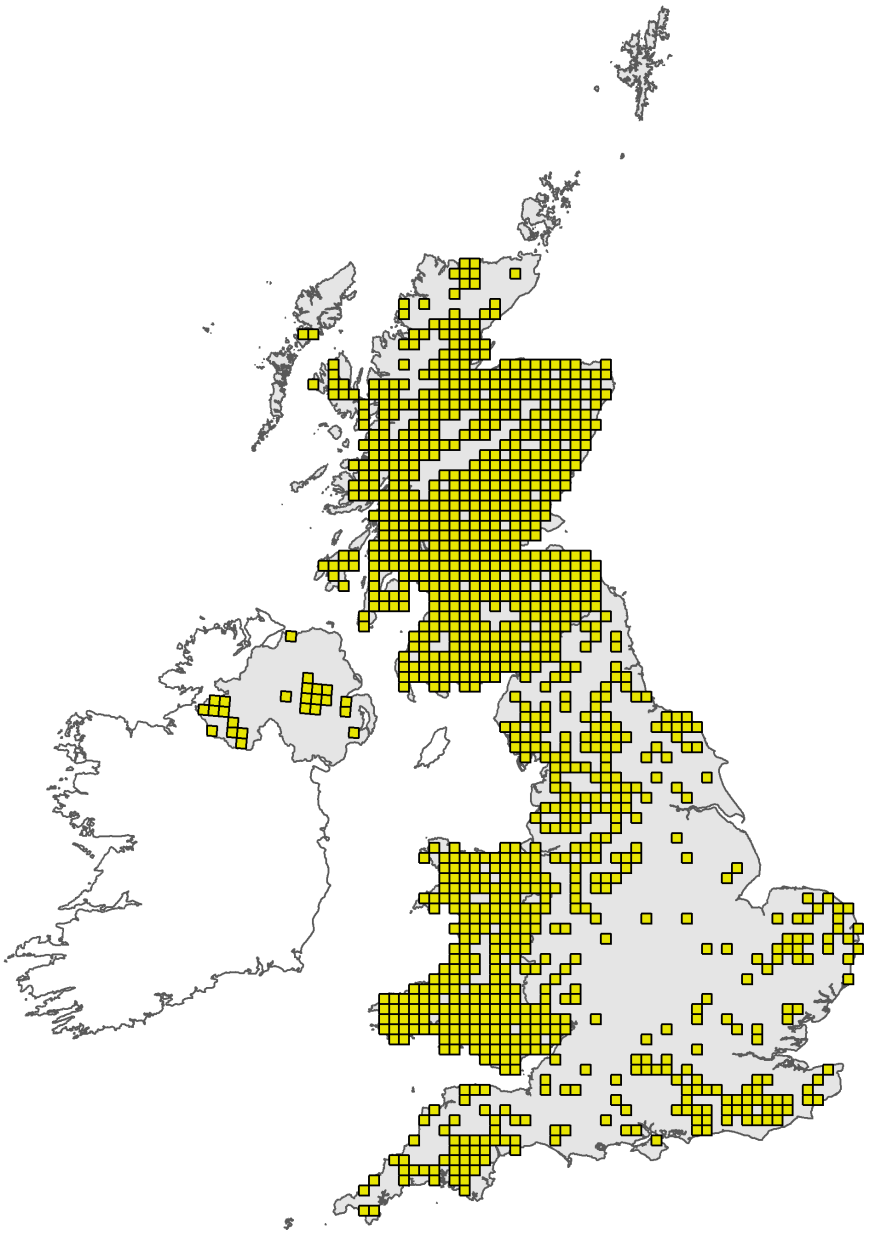

Figure 1: UK distribution map for H91E0 - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government 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

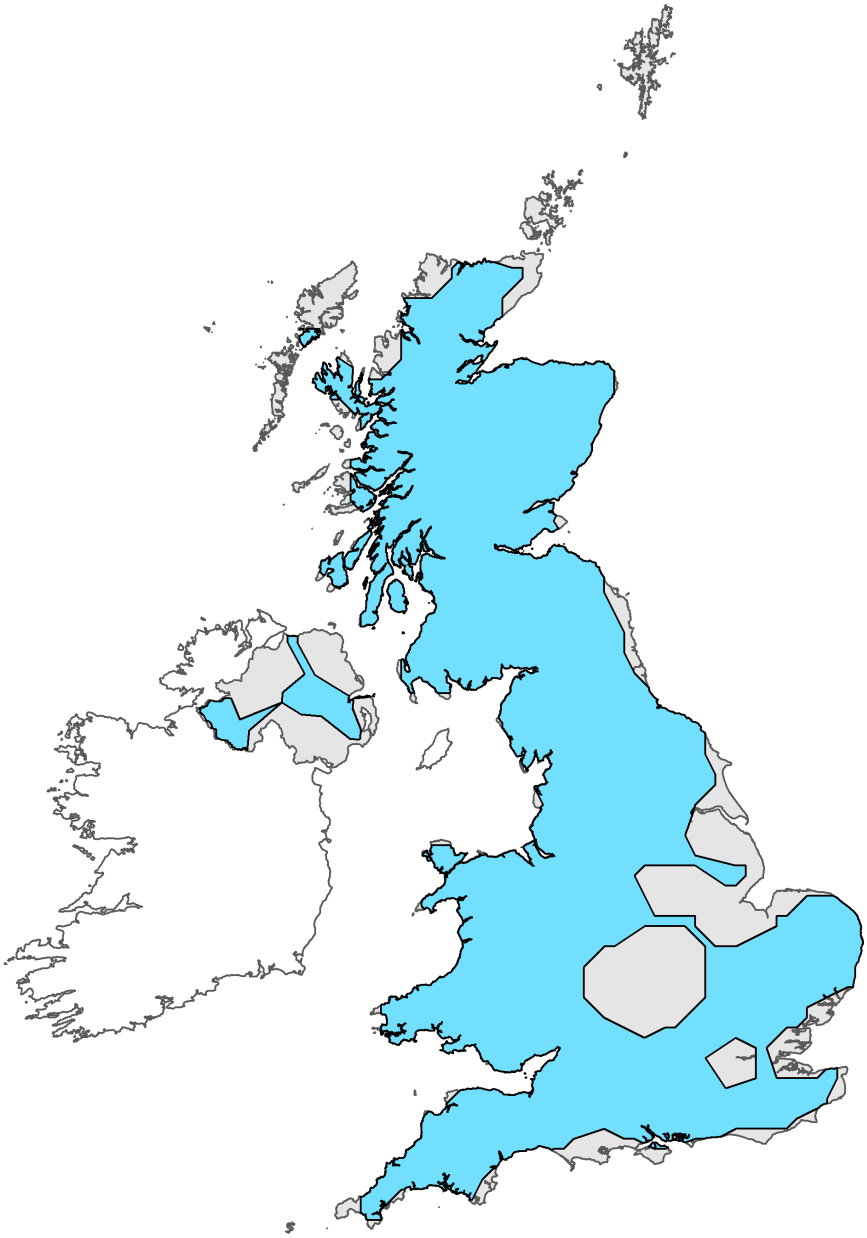

Figure 2: UK range map for H91E0 - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence 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: 91E0

Field label	Note
2.1 Year or period	An extensive analysis of the range and extent of H91E0 alluvial forests in Wales was carried out in 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. The 10km square distribution for H91EO has been derived by overlaying base maps of \Broadleaved\ and \Mixed predominantly Broadleaved\ woodland from Forestry Commission's national forest inventory (NFI) (Forestry Commission, 2011) with a grazing marsh and floodplain habitats inventory (Dargie & Dargie, 1998) and the Environment Agency's floodmaps (Environment Agency, 2004). The baseline data on woodland distribution was therefore derived from the analysis of 2006 aerial photography on which the NFI maps are based. Also see notes under 2.3 for further details.

2.3 Distribution map; Method used	Analysis has not been updated and is reproduced from 2012: 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-padion, Alnus incanae, Salicion albae) are widespread in Wales, but also highly fragmented. The habitat occurs on river alluvium and floodplains, and in theory involves a wide range of woodland types, including both wet woodland and stands on free draining soils. However, there is a strong bias towards wet woodland communities in its composition (e.g. JNCC, 2017), as the vast majority free-draining soils on floodplains have been cleared for other land uses. Woodland surveys in Wales have not systematically sampled alluvial forests, and the data available (Latham, 2001) are not adequate to produce confident estimates of range or area. Latham (2000) estimated the total area of alluvial forests in Wales to be 1,000 - 3,000 ha based on the proportion of the broader wet woodland habitat that appeared to fit the alluvial type. Since then, better GIS datasets have become available that could allow a more refined figure to be produced as described in Latham and Rothwell (2012) and summarised below. Two GIS datasets were identified as a potential basis for estimating alluvial forest range and area. 1) CCW's inventory of grazing marsh and floodplain habitats (Dargie and Dargie, 1998), and 2) Environment Agency's \floodmaps\ maps for England and Wales (Environment Agency, 2004). Preliminary analysis suggested that the maps of \Zone 3\, high risk (annual probability of flooding from rivers > 1.0%) matched the distribution of known alluvial forest well (lower risk maps included much woodland that could not be considered alluvial) and was selected for use. All \Broadleaved\ and \Mixed predominantly Broadleaved\ woodland from Forestry Commission's National Forest Inventory (NFI) (Forestry Commission, 2011) within each of the grazing marsh and floodmap layers was clipped out using a GIS routine in MANIFOLD, and the two resulting layers combined into a single layer of potential alluvial forest. This dataset was dominated by numerous tiny polygons, often in the form of minute slivers, resulting from situations where the boundaries of floodplains and adjacent woodland overlapped slightly. These small areas had doubtful ecological validity, and the decision was made to remove all polygons of under 0.5 ha (the minimum mapping unit in NFI). This produced a much clearer result, but there was still a suspicion that many very long, thin polygons of doubtful value remained. An attempt was made to purge the worst of these using the minimum woodland width of 20m used in NFI to filter out polygons which were mainly \skinny tails\ without substantial interior. This was done by applying an interior 10m buffer to all polygons, which would mean that any \skinny tails\ of < 20m width be entirely included within the buffers. The area of each polygon excluding their 10m buffers was calculated, and where this was < 0.5 ha the entire polygon was deleted. Finally, the dataset was edited manually to remove woodland polygons which are not considered alluvial because of situation, flooding regime or composition, e.g. woodland on non-alluvial wetlands (but qualifying as grazing marsh), woodland subject to marine but not alluvial flooding, or made up of plantations of non-native poplars (data from Phase 1 habitat survey, Blackstock et al., 2010). The total area of alluvial forest from this analysis is 3,000 ha (3,054.3 ha). However, there is likely to be a significant area in fragments < 0.5 ha, which although small may be ecologically important. It has been beyond the scope of this analysis to quantify this further, although it does help to emphasise the enormous degree of fragmentation affecting this habitat. The analysis is also limited by the accuracy and detail of the grazing marsh and floodmaps, and there are likely errors of both inclusion and exclusion in the resulting dataset.

Habitat code: 91E0 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 alluvial forest in Wales has not been re-assessed for the current report and 10 km squares from which it has been reported are unchanged.
5.2 Surface area	See detail in 2.3 on method and confidence
5.4 Surface area; Method used	Estimates based on GIS analysis of woodland cover, topography and flooding potential. 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 area values. See section 2.3 and Latham and Rothwell (2012) for a fuller description.
5.6 Short term trend; Direction	There is insufficient evidence against which to assess recent trends in the overall extent of this highly fragmented habitat in Wales.
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 errors in the total extent figures are likely to be very much larger than any figures for ad hoc changes that may be reported.
5.14 Change and reason for change in surface area	The area of the habitat has not been re-assessed for this report and so the values are the same as the 2012 submission.
6.2 Condition of habitat; Method used	Assessment of structure and function is based on the results of Common Standards Monitoring visits at 11 SACs where the habitat occurs as a feature (NRW, 2018). This is the only information comprehensively available across a sample of the resource. Most recent assessment dates ranged from 2005 to 2017, with 9/11 carried out in 2012 or later. 4/11 (36%) were classified as favourable at most recent assessment, although the breakdown by proportional area (see 6.1) shows a much stronger bias towards unfavourable. Reasons for failure varied and were a mix of quite specific issues such presence of non-native species and fly tipping, and less well-defined concerns about regeneration and structure. Overall, the impression is that the structure and function within alluvial forests sites is currently not bad, and perhaps closer to favourable overall than most other woodland types in Wales; this is probably related to their relative inaccessibility, often with a history of uninterrupted natural development, and fewer issues relating to past management structure and grazing. However, at the larger scale of functional units within floodplains there are serious concerns that are not immediately apparent at a site based level of assessment. Alluvial forests by their nature are linked to the dynamics of rivers, with cycles of regeneration, structure and composition linked to the long-term movement of rivers (Peterken and Hughes, 1995); they naturally would also be far more extensive on floodplains, occupying the full range of soils types including free-draining, predominantly dry and fertile soils. In reality, most rivers are constrained, and fragments of alluvial forest are static in location and on a biased selection of wetter soils with little scope for long term natural dynamics.
6.3 Short term trend of habitat area in good condition; Period	For 10/11 sites where there has been reassessment between 2005 and 2017 (NRW, 2018), 3 have changed condition (representing 88.4 ha, c. 20% of total SAC area). However, the extent to which this is due to real change, or refinement of conservation objectives and methodology is unclear.
6.4 Short term trend of habitat area in good condition; Direction	Two sites have been assessed as having changed condition from Favourable to Unfavourable (86.6 ha) and one site from Unfavourable to Favourable (1.8 ha) during this period. However, it is unclear whether this is due to real change, or refinement of conservation objectives and methodology. The changes to Unfavourable relate to an increase in INNS in one case, and a one-off loss of habitat in another so it is not possible to suggest trends.

7.1 Characterisation of pressures/ threats	Pressures: Several of the pressures identified as impacting on alluvial forest relate to the loss of the dynamic natural processes and separation from the hydrological systems that characterise the habitat, notably A33 'Modification of hydrological flow or physical alteration of water bodies for agriculture'. Closely connected are A01, F01, F03 and E01, relating to loss/prevention of restoration of the habitat and its functional context because of agriculture, built development and infrastructure. Habitat loss may be relatively minor in terms of absolute area, but may affect many small, ecologically connected areas that are unprotected by any particular mechanism, or that may be young seral stages of the habitat that are considered scrub in the public-eye rather than woodland and accordingly afforded lesser value. Development pressure may be especially high at urban fringes on land that supports the habitat. N09 'Other climate related changes in biotic conditions' is intimately linked to these pressures, included here 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. I02 invasive non-native species are also a particular concern for alluvial forests as they are vulnerable to colonisation by water borne dispersal, e.g. of Himalayan balsam Impatiens glandulifera and Japanese knotweed Fallopia japonica. J01 mixed source pollution to surface and ground waters is important in alluvial forest, often relating to agricultural inputs. Air pollution J03 is likely to be universal for alluvial forests, although the impacts on this naturally relatively high nutrient status habitat may be less than in other woodland types. I05 tree pathogens are currently considered to have a relatively low impact on alluvial forest. The major component alder Alnus glutinosa is affected and often killed by the pathogen Phyophthora alni (Forestry Commission, 2018a). Although it is present in many alluvial situations has not yet had the major impacts in Wales feared at its discovery in the 1990s. Ash Fraxinus excelsior is also an important component of the habitat and is becoming seriously affected by Chalara dieback (Hymenoscyphus fraxineus). As of June 2018, the disease has been confirmed within 79.6% of 10km squares in Wales (Forestry Commission, 2018b). This is a minimum distribution as it reflects sampling rather than actual distribution. Low pressures identified include I04 deer browsing and issues relating to inappropriate woodland management B04/B12 which is generally less of an issue in alluvial forests which, by their nature, are both well suited to low intervention management systems and often difficult and unattractive to manage; occasionally there is a benefit from coppicing, and manipulation of canopy composition to remove non-native tree species. F09 is included to cover fly-tipping, which can locally have an impact on woodland condition.) Method used - pressures: Mainly based on expert judgement and other data The assessment here is based on the submission from 2012, but reconsidered using expert judgement and updated accordingly for 2018. The data held in the \Actions Database\ were used to provide a basis for quantifying pressures/threats relating to alluvial forests. 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. Threats: Most of the pressures identified above can be expected to remain as threats. Loss to agriculture and built development, or more often lack of opportunities for woodland expansion around alluvial forest because of competition with other land uses is a very serious threat affecting the habitat's long-term condition and cannot be expected to get better soon. Alluvial woodland 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. Tree pathogens may be expected to have an increasingly

	serious impact on the habitat, with the two major canopy components ash and alder being affected by diseases. The loss of ash trees could have major impact on the composition and ecological functioning of the habitat. Deer are at present only a very localised problem in alluvial forest sites in Wales, but the experience in England and Scotland suggests that they are potentially a serious threat for the future. Native (roe deer Capreolus capreolus) or long naturalised species (fallow deer Dama dama) are most likely to be involved, although increasingly non-native species, particularly muntjac Muntiacus reevesi may be present. Method used - threats: Expert opinion The pressures identified above 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 alluvial 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	CA15: Manage drainage and irrigation operations and infrastructures in agriculture. This measure relates to activities to reinstate natural processes on floodplains to reconnect floodplain forests to their natural hydrological regimes. The measure may be carried out specifically for the benefit of floodplain forests, or perhaps more often for the benefit of ecosystem services such as flood management using the principle of Nature Based Solutions. As such it may be increasingly supported by policy such as WG's Natural Resources Policy (Welsh Government, 2017). CB08: Restoration of Annex I forest habitats. This measure is critical for alluvial forests as their area is highly diminished and fragmented. Locations for habitat restoration are limited because the land they would naturally occur on is often highly productive and valuable for agriculture or desirable for built development. CI03: Management, control or eradication of other invasive alien species. INNS are widespread problem in alluvial forests, and they are easily invaded by species with waterborne propagules. CN02: Implement climate change adaptation measures. This relates to the broad need to develop the resilience of the alluvial forest 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). CJ01: Reduce impact of mixed source pollution. This relates to activities to reduce the impacts of both water and aerial pollution on the habitat, at local, catchment, and national scales. 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. 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. CI05: Management of problematic native species. This relates to the development and contribution to deer management plans and activities. 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 alluvial forest 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. CE01: Reduce impact of transport operation and infrastructure. Relates to work to minimise impacts of new developments through appropriate planning, design and mitigation.
9.1 Future prospects of parameters	9.1a Future prospects of -range.The habitat is already widespread throughout Wales, although of low area and highly fragmented. The range might be expected to increase marginally.9.1b Future prospects of -area Whilst attrition of small areas of alluvial forest can be expected to continue, there is also a good chance that new areas of alluvial forest will be established both for their biodiversity value and because they provide a number of ecosystem services, especially in relation to flood mitigation. As such they help deliver Nature Based Solutions, which for example is an objective within WG's Natural Resources Policy (Welsh Government, 2017). 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 which will generally prevail or whether structure and function will remain stable overall.
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: 4.35 km2 Maximum: 4.35 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 (held on NRW GIS system). Areas of alluvial 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 and refined with topographic assessments to re-assess the total area of alluvial forest included on SACs beyond that originally recorded as a feature.
11.4 Short term trend of habitat area in good condition within the network; Direction	For 10/11 sites the that have been reassessed between 2005 and 2017, 3 have changed condition (representing 88.4 ha and c. 20% of total SAC area). However, it is unclear whether this is due to real change, or refinement of conservation objectives and methodology.
11.5 Short term trend of habitat area in good condition within the network; Method used	Two sites have been assessed as having changed condition from Favourable to Unfavourable (86.6 ha) and one site from Unfavourable to Favourable (1.8 ha) during this period. However, it is unclear whether this is due to real change (except in one case relating to unconsented works), or refinement of conservation objectives and methodology and it is not possible to suggest trends.