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:

H2170 - Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)

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	**2170 - Dunes with Salix repens ssp. argentea (Salicion arenariae)**

2. Maps

2.1 Year or period	1991-2017
2.3 Distribution map	Yes
2.3 Distribution map Method used	Complete survey or a statistically robust estimate
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	Ashall, J., Duckworth, J., Holder, C. (1992). Sand dune survey of Great Britain. Site report no. 120 Tai Morfa, Dwyfor Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 86). Ashall, J., Duckworth, J., Holder, C. (1992). Sand dune survey of Great Britain. Site report no. 129 Kinmel Bay, Colwyn, Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 98). Ashall, J., Duckworth, J., Holder, C. (1994). Sand dune survey of Great Britain. Site report no. 113 Dunes between Tywyn & Aberdovey, Meirionydd, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 81). Ashall, J., Duckworth, J., Holder, C. (1995). Sand dune survey of Great Britain. Site report no. 125 Tywyn Gwyn, Anglesey, Ynys Mon, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 94). Ashall, J., Duckworth, J., Holder, C., McConnell, A., Smart, S. (1995). Sand dune survey of Great Britain. Site report no. 108 Whitesands Bay, Preseli, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 71). Ashall, J., Duckworth, J., Holder, C., McConnell, A., Smart, S. (1995). Sand dune survey of Great Britain. Site report no. 110 Poppit Sands, Preseli, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 73). Ashall, J., Duckworth, J., Holder, C., Smart, S. (1992). Sand dune survey of Great Britain. Site report no. 111 Towyn Warren, Ceredigion, Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 79). Ashall, J., Duckworth, J., Holder, C., Smart, S. (1992). Sand dune survey of Great Britain. Site report no. 112 Ynyslas, Ceredigion, Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 80). Ashall, J., Duckworth, J., Holder, C., Smart, S. (1992). Sand dune survey of Great Britain. Site report no. 115 Morfa Dyffryn Meirionydd (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 90). Ashall, J., Duckworth, J., Holder, C., Smart, S. (1994). Sand dune survey of Great Britain. Site report no. 100 Pendine Burrows, Carmarthen, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 78). Ashall, J., Duckworth, J., Holder, C., Smart, S. (1994). Sand dune survey of Great Britain. Site report no. 105 Stackpole Warren, Barafundle Bay and Broad Haven South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC)

Peterborough. (JNCC Report 69).
Ashall, J., Duckworth, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report no. 104 Freshwater Bay East, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 66).
Ashall, J., Duckworth, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report no. 131 Gronant to Talacre, Delyn, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 46).
Ashall, J., Holder, C. (1992). Sand dune survey of Great Britain. Site report no. 128 Conwy and Deganwy dunes, Aberconwy Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 97).
Ashall, J., Holder, C. (1992). Sand dune survey of Great Britain. Site report no. 130 dunes between Rhyl and Prestatyn, Rhuddlan, Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 99).
Ashall, J., Holder, C. (1992). Sand dune survey of Great Britain. Site report no. 132 Penrhynoedd-Llangadwaladr, Ynys Mon Wales 1991 (DRAFT VERSION). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 100).
Ashall, J., Holder, C., Duckworth, J. (1994). Sand dune survey of Great Britain. Site report no. 119 Traeth Crugan, Dwyfor, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 85).
Ashall, J., Holder, C., Duckworth, J. (1995). Sand dune survey of Great Britain. Site report no. 103 Manobier & Swanlake Bay, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 65).
Ashall, J., Holder, C., Smart, S. (1992). Sand dune survey of Great Britain. Site report no. 114 Fairbourne, Meirionydd, Wales 1991 (draft). Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 82).
Ashall, J., Holder, C., Smart, S. (1994). Sand dune survey of Great Britain. Site report no. 106 Broomhill & Kilpaison Burrows, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 70).
Ashall, J., Holder, C., Smart, S. (1994). Sand dune survey of Great Britain. Site report no. 117 Morfa Bychan, Meirionydd, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 83).
Ashall, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report no. 180 The Bennett, Preseli, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 72).
Ashall, J., Holder, C., Smart, S., Duckworth, J. (1994). Sand dune survey of Great Britain. Site report no. 115 Morfa Harlech, Meirionydd, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 91).
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.
Creer, J. (2005). Y Twyni o Abermenai i Aberffraw SAC: H2170 Dunes with Salix repens & H2190 Humid dunes slacks. Countryside Council for Wales SAC monitoring report.
Creer, J. (2012). Y Twyni o Abermenai i Aberffraw SAC: H2170 Dunes with Salix repens & H2190 Humid dunes slacks. Countryside Council for Wales SAC monitoring report.
Duckworth, J., Holder, C. (1995). Sand dune survey of Great Britain. Site report No. 126 Traeth Lligwy & Traeth Dulas, Anglesey, Ynys Mon, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 95).
Duckworth, J., Holder, C. (1995). Sand dune survey of Great Britain. Site report

No. 127 Red Wharf Bay, Ynys Mon, Anglesey, Wales. 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 96).
Duckworth, J., Holder, C., Smart, S. (1992). Sand dune survey of Great Britain. Site report No. 118 Dunes between Pwllheli and Pen-y-chain, Dwyfor, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 84).
Duckworth, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report No. 121 Morfa Dinlle, Arfon, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 87).
Duckworth, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report No. 123 Aberffraw, Ynys Mon, Wales, 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 45).
Duckworth, J., Holder, C., Smart, S. (1995). Sand dune survey of Great Britain. Site report No. 124 Valley airfield and golf links, Ynys Mon, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 93).
Guest, D. (2012a). Assessing pressures and threats for article 17 reporting based on information in CCW's Actions Database. CCW HQ internal document.
Guest, D. (2012b). Assessing N deposition as a pressure for Article 17 reporting on habitats. CCW HQ internal document.
Holder, C., Duckworth, J., Ashall, J. (1994). Sand dune survey of Great Britain. Site report no. 102 Lydstep, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 64).
Holder, C., Smart, S., McConnell, A. (1994). Sand dune survey of Great Britain. Site report no. 101 Caldey Island, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 63).
Houston, J. A. (2008). Management of Natura 2000 habitats. 2190 Humid dune slacks. European Commission.
Huckbody, A., May, S., Rhind, P. M. (1993). Sand dune survey of Great Britain. Site report no. 107 Brownslade & Linney Burrows, South Pembrokeshire, Wales 1991. Joint Nature Conservation Committee (JNCC) Peterborough. (JNCC Report 67).
JNCC. (2004). Common standards monitoring guidance for sand dune habitats. JNCC. http://jncc.defra.gov.uk/pdf/CSM_coastal_sand_dune.pdf
Jones, G. (2017). Coastal habitat mapping and monitoring utilising remote sensing. PhD Thesis Aberystwyth University.
Kay, L. (2018). Article 17 2018 GIS Layer Processing Notes: H2170 Dunes with Salix repens ssp. argentea (Salicion arenariae). Internal NRW document.
Lewis, H. (2002). Morfa Harlech a Morfa Dyffryn SAC: H2110 Embryonic shifting Dunes, H2120 Shifting dunes along the shoreline with Ammophila arenaria, H2170 Humid Dune Slacks, H2190 Dune Slacks with Salix repens ssp. argentea (Salicion arenariae). Countryside Council for Wales SAC monitoring report.
Lewis, H. (2007). Morfa Harlech a Morfa Dyffryn SAC: H2170 Dunes with Salix repens ssp. argentea (Salicion arenariae) & H2190 Humid dunes slacks. Countryside Council for Wales SAC monitoring report.
Newberry, C., Wilkinson, K., Westwood, S. and Woodman, J. (2007). Carmarthen Bay Dunes SAC. SAC Monitoring Report (2007 - 2012). Countryside Council for Wales.
NRW. 2017. Actions Database. NRW internal database.
Rhind, P. M., Blackstock, T. H., Hardy, H. S., Jones, R. E., & Sandison, W. (2001). The evolution of Newborough Warren dune system with particular reference to the past four decades. In: J. A. Houston, S. E. Edmondson & P. J. Rooney (eds.). Coastal dune management. Shared experience of European conservation practice. Proceedings of the European Symposium Coastal Dunes of the Atlantic

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Biogeographical Region Southport, northwest England, September 1998. Liverpool University Press.
Rhind, P. M., Jones, R., Jones, M. L. M. (2008). Confronting the impact of dune stabilization and soil development on the conservation status of sand dune systems in Wales. Proceedings of the International Conference on Management and Restoration of Coastal Dunes, Santander, Spain (ICCD 2007). Universidad de Cantabria, pp.143-152.
Rhind, P. & Jones, R. (2009). A framework for the management of sand dune systems in Wales. Journal of Coastal Conservation, Vol. 13, pp.15-23.
Rhind, P., Stevens, D. & Sanderson, R. 2006. A review and floristic analysis of lichen-rich grey dune vegetation in Britain. Proceedings of the Royal Irish Academy, Vol.106B, pp. 301- 310.
Rodwell, J. S. (ed.) (2000). British Plant Communities. Volume 5. Maritime Communities and Vegetation of Open Habitats. Cambridge University Press.
Wilkinson, K. (2006). Carmarthen Bay Dunes SAC: H2170 Dunes with Salix repens ssp. argentea (Salicion arenariae) & H2190 Humid dunes slacks. Countryside Council for Wales SAC monitoring report.
Wilkinson, K. (2018). Dunes with Salix Kenfig SAC Monitoring Report. NRW Evidence Report (draft in prep).

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	Improved knowledge/more accurate data Use of different method	
	The change is mainly due to:	Improved knowledge/more accurate data
4.12 Additional information		

5. Area covered by habitat

5.1 Year or period	1991-2017		
5.2 Surface area (in km²)	a) Minimum	b) Maximum	c) Best single value 2.5061
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Complete survey or a statistically robust estimate		
5.5 Short-term trend Period	2007-2018		
5.6 Short-term trend Direction	Increasing (+)		
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval

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5.8 Short-term trend Method used	Based mainly on expert opinion with very limited data		
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	Improved knowledge/more accurate data Use of different method The change is mainly due to: Improved knowledge/more accurate data		
5.15 Additional information			

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum 0.4247	Maximum 0.4247
	b) Area in not-good condition (km²)	Minimum 1.7973	Maximum 1.7973
	c) Area where condition is not known (km²)	Minimum 0.2841	Maximum 0.2841
6.2 Condition of habitat Method used	Complete survey or a statistically robust estimate		
6.3 Short-term trend of habitat area in good condition Period	2007-2018		
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
Extensive grazing or undergrazing by livestock (A10)	H
Application of natural fertilisers on agricultural land (A19)	H
Sports, tourism and leisure activities (F07)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Problematic native species (I04)	M

Abstraction from groundwater, surface water or mixed water (K01)	M
Drainage (K02)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	M
Mixed source air pollution, air-borne pollutants (J03)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	H
Application of natural fertilisers on agricultural land (A19)	H
Sports, tourism and leisure activities (F07)	H
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H
Other invasive alien species (other then species of Union concern) (I02)	H
Problematic native species (I04)	M
Abstraction from groundwater, surface water or mixed water (K01)	M
Drainage (K02)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	M
Mixed source air pollution, air-borne pollutants (J03)	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		Restore the habitat of the species (related to 'Habitat for the species')
8.3 Location of the measures taken		Both inside and outside Natura 2000
8.4 Response to the measures		Long-term results (after 2030)
8.5 List of main conservation measures		

Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent

measures (CA04)

Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)

Reduce impact of outdoor sports, leisure and recreational activities (CF03)

Reduce/eliminate air pollution from industrial, commercial, residential and recreational areas and activities (CF06)

Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)

Manage water abstraction for public supply and for industrial and commercial use (CF11)

Reduce impact of military installations and activities (CH01)

Management, control or eradication of other invasive alien species (CI03)

Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes (CL01)

8.6 Additional information

9. Future prospects

9.1 Future prospects of parameters

a) Range
b) Area
c) Structure and functions

9.2 Additional information

10. Conclusions

10.1. Range

10.2. Area

10.3. Specific structure and functions (incl. typical species)

10.4. Future prospects

10.5 Overall assessment of Conservation Status

10.6 Overall trend in Conservation Status

10.7 Change and reasons for change in conservation status and conservation status trend

a) Overall assessment of conservation status

No change

The change is mainly due to:

b) Overall trend in conservation status

No change

The change is mainly due to:

10.8 Additional information

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

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)

a) Minimum
b) Maximum
c) Best single value 2.3968

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

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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

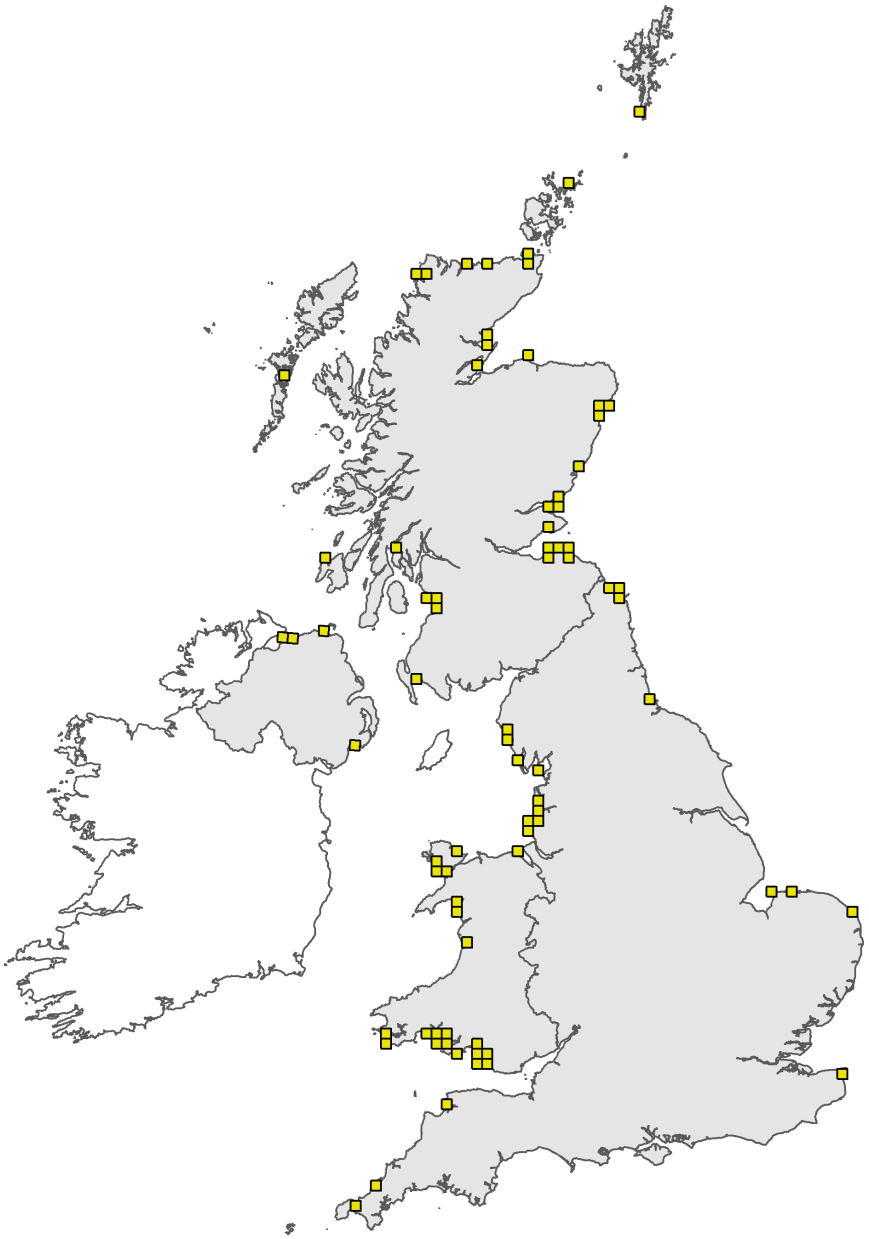

Figure 1: UK distribution map for H2170 - Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas 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

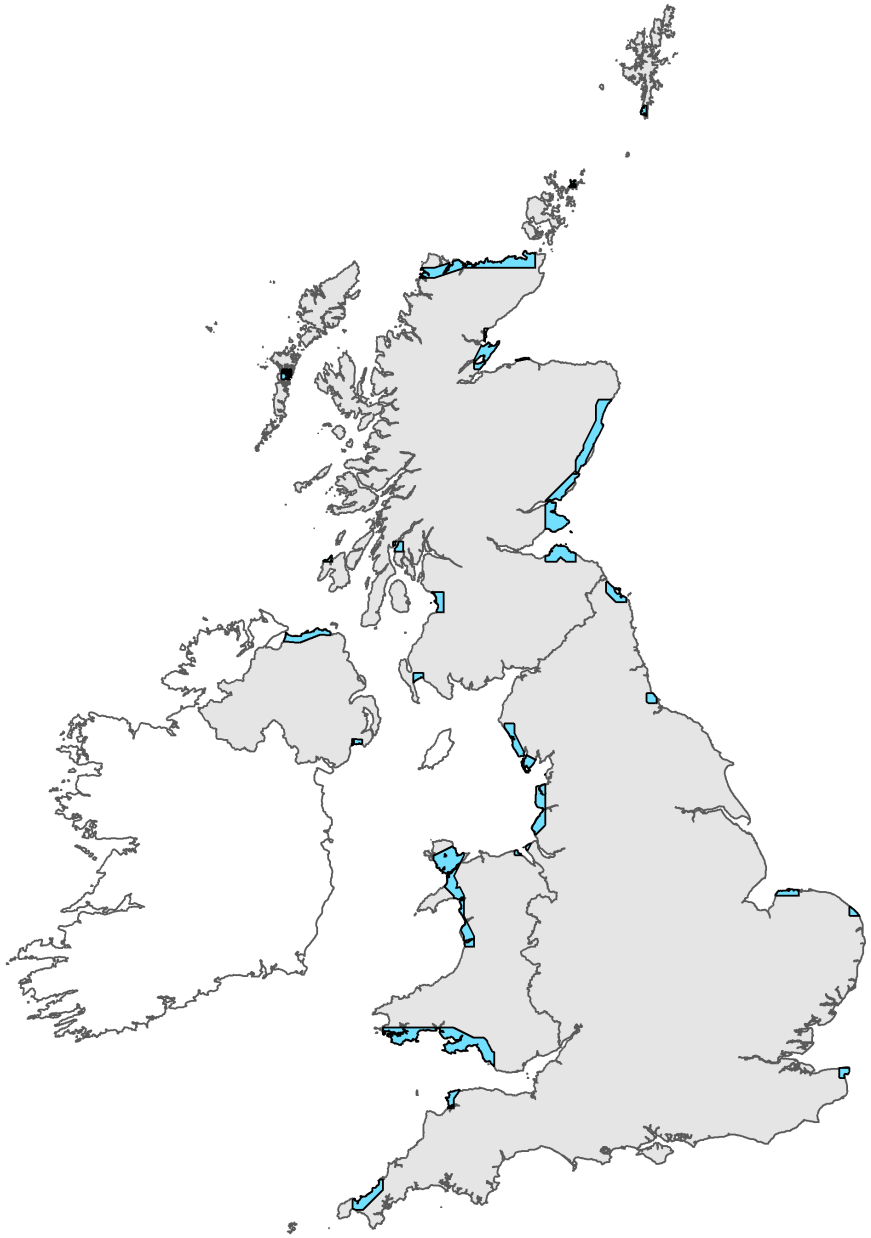

Figure 2: UK range map for H2170 - Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: 2170

Field label	Note
2.3 Distribution map; Method used	The 10km square distribution and habitat area estimates are derived from a combination of different original sources, summarised below. A single aggregated GIS layer has been created for this habitat across Wales (data source 1 below) pulling together the maps and records from the other listed sources. Detailed processing notes for the 2018 Article 17 extent layer have been produced (Kay, 2018). Data source 1 (MAIN DATA SOURCE): Digital GIS Map Layer: Article 17 H2170 Dunes with Salix repens ssp. argentea (Salicion arenariae) Extent Layer 2018 (Kay, 2018). Data source 2 (MAIN DATA SOURCE): Sand Dune Vegetation Survey of Great Britain Part 3 - Wales (Dargie, 1995). This was a comprehensive survey of all sand dunes in Wales (see published sources) based on the UKs National Vegetation Classification (NVC) (Rodwell, 2000). Data source 3 (SECONDARY DATA SOURCE): Coastal habitat mapping and monitoring utilising remote sensing PhD Thesis (Jones, 2017). The study focused on the use of Very High Resolution (VHR) optical imagery for retrieving parameters to identify associations that can separate habitat boundaries for extent mapping down to species level for indicators of condition, with a focus on operational use. The Earth Observation Data for Habitat Monitoring (EODHaM) system was implemented using Worldview-2 data from two periods (July and September 2016), in situ data and local ecological knowledge for two sites in Wales, Kenfig Burrows SAC and Castlemartin SSSI. The Sand Dune surveys (Dargie, 1995) were carried out over 20 years ago and so several intra-site changes are likely to have occurred, but, no sites have been lost or irreversibly damaged. SD16 was the only NVC community used for this habitat. 10 km grid square SS88 was discounted in 2012 for \SS88 appears to be a mistake since it is too far inland for this habitat to occur\, however, the Jones (2017) remote sensing dataset shows H2170 to be present within the south western most part of the grid square, being part of the Kenfig SAC. The 2018 data is considered to give a good representation of the current distribution and extent of this habitat.

Habitat code: 2170 Region code: ATL

Field label	Note
4.3 Short term trend; Direction	Recent losses and gains of this habitat at individual sites do not appear to have affected range at least since the Phase II baseline data was created in the early 1990s. No instances have been identified where, since 2001, the habitat has either been totally lost from a 10km square or created or restored within a 10km square where it was not present at the start of the period.
4.11 Change and reason for change in surface area of range	There is no evidence of actual change in the range of this habitat since the previous report in 2012, however, re-examination of the range has resulted in the deletion of some 10km squares (reported to contain the habitat in 2012), where the habitat is known not to occur and the inclusion of one other (SS88), which was erroneously rejected in the 2012 report.
5.1 Year or period	The data used to produce the total area figure are predominantly from 1991 - 1995. Post 1995 information includes remote sensing habitat data for Kenfig from 2017 (Jones, 2017). This new dataset is considered to provide good coverage for Kenfig, however, the data from the Sand Dune Vegetation Survey Wales (Dargie, 1995) is rather old and may not be an accurate representation of the current area of the feature.

5.3 Type of estimate	Estimate is mostly based upon an old data set (Sand Dune Vegetation Survey of Great Britain - Wales (Dargie, 1995)), which has been filtered to only include records containing SD16 (corresponding NVC community for the Annex I habitat type). The only contemporary data is for Kenfig where remote sensing data has been used to derive the extent of the H2170 habitat (Jones, 2017). It is very likely that the habitat has changed in extent on some sites due to vegetation succession and changes in management.
5.4 Surface area; Method used	The total area is derived largely from the Phase 2 Sand Dune Survey of Great Britain (Dargie, 1995) with surveys carried out in Wales in the early 1990s (see published sources). The survey used the UKs National Vegetation Classification (NVC) (Rodwell, 2000) and provided a near complete survey of sand dune systems in Wales. A more recent remote sensing data set was used to determine the extent of the H2170 habitat at Kenfig (Jones, 2017).
5.6 Short term trend; Direction	The short-term trend for this habitat in Wales is \increasing\ as potentially there may have been a small increase, but this would have been at the expense of more species-rich early successional stages of H2190 humid dune slack habitat. However, there is no quantitative contemporary data to support this, but, based on ad hoc observations and expert judgement would suggest there has probably been a small increase in the extent of H2170 in Wales.
5.8 Short term trend; Method used	There is limited information on short term trends in extent for this habitat. Within the current reporting round SAC monitoring has covered one site in Wales (Kenfig) - no changes in extent were noted during SAC monitoring (Wilkinson, 2018), but extent was not formally assessed. Based on recent studies (Rhind et al., 2008, Rhind & Jones, 2009) there has been a clear trend towards increasing stabilisation that is likely to have favoured this habitat, which represents the more mature end of dune slack succession. There is some indication that dune slacks in Wales have been getting more mature, favouring the development of this habitat. Potentially there may have been a small increase in this habitat, but this would have been at the expense of more species-rich early successional stages of H2190 humid dune slack habitat. However, there is no qualitative contemporary data to support this, but, based on ad hoc observations and expert judgement would suggest there has probably been a small increase in the extent of H2170 in Wales. These likely gains in this habitat may to some extent, have been offset by losses, where either undermanaged examples have developed into stands of dense scrub or, more locally, where turf stripping has reinstated earlier stages in dune slack development as part of a conservation management strategy.
5.14 Change and reason for change in surface area	The increase in surface area since 2013 is due to the use of a different method to calculate the area of the feature using the Sand Dune Vegetation Survey of Great Britain - Wales (Dargie, 1995) and the addition of new area data for Kenfig (Jones, 2017).
6.1 Condition of habitat	Condition of habitat was only partially assessed in this reporting round, with its condition monitored on only one of the four SACs on which it is a qualifying (A-C grade) feature. Feature condition on the other three SACs is reported based on assessments undertaken in the 2007-2012 reporting round.
6.2 Condition of habitat; Method used	There is little information available about the condition of H2170 on SAC sites where the feature is not notified as A-C grade (17.48 ha 2261 7%) and SSSI sites which are not part of the N2K series (4.35 ha 2261 2%). Together these sites represent 9% of the total habitat in Wales. There is very little information about habitat condition on non-statutory sites. Together these sites represent only 3% (6.37 ha) of the total habitat in Wales. The SAC monitoring (which is based on Common Standards Monitoring (JNCC, 2004)) results give an almost complete (if somewhat out of date - 3 out of 4 assessments from the last reporting round) picture of the condition of the habitat in Wales covering 89% of the total resource.

7.1 Characterisation of pressures/ threats	Data held in NRWs Special Sites Actions Database (NRW, 2018), which provides information on \issues\ affecting habitat and species within the protected sites series in Wales, were used to provide a basis for quantifying pressures / threats relating to the habitat. The special sites (SSSI and SAC) include 97% of the H2170 resource in Wales by area. Pressures: Five pressures are ranked as High A10 - Extensive grazing or under-grazing by livestock A19 - Application of natural fertilisers on agricultural land F07 - Sports, tourism and leisure activities A26 - Agricultural activities generating diffuse pollution to surface or ground waters I02 - Other invasive alien species (other than species of Union concern) A10 - Establishing grazing has been an ongoing problem for several sites and several sites are now showing evidence of scrub encroachment. Efforts are being made to reverse this trend. A19 - This has been a problem on at least one site (Aberffraw) where abattoir slurry was being used on adjacent fields to the dunes and having a negative impact on the Annex I habitats. F07 - Problems here include vehicle access, camping and making fires within dune slacks. A26 - This has been a problem on at least one major site (Merthyr Mawr) but several other sites are susceptible. I02 - This mainly relates to Sea buckthorn (which is not native to Wales). Sea buckthorn has caused problems on several sites especially in south Wales and will readily establish itself in dryer dune slacks. major efforts have been made to control this species at Merthyr Mawr (part of Kenfig SAC). Other species of concern include conifer species, Japanese rose, Montbretia, Black cherry and Cotoneaster. A further three pressures, I04, K01, L02 were also ranked as High but were down-graded to Medium for the purposes of UK reporting. I04 - Problematic native species K01 - Abstractions from groundwater, surface water or mixed water L02 - Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) I04 - Lack of appropriate grazing combined with increasing levels of stabilisation has led to scrub encroachment on several sites. This is an ongoing management issue and has been reversed on some sites. K01 - Many dune slacks in Wales have been affected by local drainage schemes reducing water table levels. Quarry de-watering at one site is a potential concern. Water abstraction has also proved to be a problem on one site. L02 - Because of the lack of mobility and dynamism most dune systems in Wales are undergoing succession towards more stable \rank vegetation\ and undesirable scrub communities, probably exacerbated by increasing levels of eutrophication due in part to atmospheric pollution and possibly ground water contamination in places. An additional four pressures, K02, B01, A06 & J03 were categorised as Medium in Wales but only the two most significant of these K02 and B01 are included in the final report to JNCC for UK reporting. The following pressures are important and are ranked as having a Medium impact: K02 - Drainage B01 - Conversion to forest from other land uses, or afforestation (excluding drainage) K02 - Many dune slacks in Wales have been affected by local drainage schemes reducing water table levels. Quarry de-watering at one site is a potential concern. Water abstraction has also proved to be a problem on one site. B01 - Forestry plantations have fossilised dunes and the scrub within the forest plantations is providing a seed source for scrub seeding into the dunes. The trees are also likely to be causing a decrease in the dune water table which is negatively affecting dune slack vegetation (sites affected: Newborough, Morfa Harlech, Pembrey and Whiteford). The following pressures are important and ranked as having a Medium impact but have not been included for UK reporting purposes. A06 - Abandonment of grassland management (e.g. cessation of grazing or of mowing) J03 - Mixed source air pollution, air-borne pollutants 7. HABITAT MAIN PRESSURE & THREATS. A06 - Establishing appropriate grazing has been an ongoing problem for several sites and some sites are now showing evidence of insufficient grazing. In some cases, there is insufficient grazing to maintain good species diversity and prevent scrub encroachment. There are some examples in Wales where dune slacks have turned into wet woodland, although efforts are being made to reverse this trend. J03 - Atmospheric nitrogen deposition and eutrophication of ground water has accelerated the natural succession of sand dune communities and coupled with the lack

	of geomorphological processes, has resulted in vegetation succession towards more stable rank grassland and scrub communities. Threats: Five threats (ranked High) were identified and assessed in a similar way to the pressures outlined above (Guest, 2012a). In addition to the threats listed in section 7.1, Climate Change and sea-level rise could pose a significant threat to the series of sand dune systems in Wales. Most dune systems have been formed by natural sand movement, but now lie within more stable dune systems. The lack of mobility and dynamism most dune systems in Wales are undergoing results in succession moving towards more stable \rank vegetation\ and undesirable scrub communities, probably exacerbated by increasing levels of eutrophication, due in part to atmospheric pollution and possibly ground water contamination in places. All the main pressures affecting the habitat in Wales are considered to be ongoing and are expected to continue to impact the habitat over the next two reporting cycles.
8.5 List of main conservation measures	In Wales the vast bulk of the habitat by area falls within the protected sites series (97% is on SSSI's and 87% is listed as a SAC feature). 26% of the total H2170 habitat on SSSI is covered by management agreement. 26% of the habitat by area is covered by Glastir Advanced agreements: 0.8% is covered by \grazed pasture - no inputs\; 15% is covered by \management of sand dunes\; and 10% is covered by \management of sand dunes with mixed grazing\. 16% of the habitat by area is covered by Glastir Entry agreements \management of sand dunes\. 11% of the habitat by area is covered by Glastir Entry Commons. Efforts have been made on several sites to maintain the open nature of this habitat, which can become invaded by scrub and wetland trees. On overly mature sites, turf stripping is also often a necessary requirement to re-establish links with the water table. These measures are creating areas of both H2170 Dunes with Salix repens ssp. argentea (Salicion arenariae) and H2190 Humid dune slacks but part of this strategy is to create embryonic dune slacks and kick-start the geomorphological processes within the dunes. Specific management measures are required and include increased or reintroduced grazing management (CA04) and invasive species (CI03) and native scrub control (CI05). Efforts are in place to implement restoration of H2170 via externally funded projects under the EU LIFE programme and the Heritage Lottery Fund (CA04, CA11, CF03, CF06, CF10, CH03, CI03, CI05, CL01). Other conservation measures include special projects, e.g. towards BAP targets for maintenance, improvement of condition, restoration and expansion of the resource (CA04, CF03, CH03, CI03, CI05, CL01). Regulations may often be inadequate to fully protect the habitat, e.g. in tackling under-management or neglect.

9.1 Future prospects of parameters	Despite several ongoing threats to the habitat, statutory protection of the bulk of the sites provides protection against total loss and changes to the 10km2 distribution are considered unlikely in the short to medium term. The future trend in area of H2170 is considered likely to be stable or even increasing, with any losses to scrub or as a result of turf stripping for conservation purposes likely to be at least offset by gains as other dune slack types mature. The habitat is being adversely affected by several factors which are negatively affecting the structure and function of the habitat, such as, * over and under-grazing (under-grazing is related to increased grassiness and scrub encroachment), * nutrient enrichment (from a variety of different sources) leading to loss of characteristic species, * recreational activities such as vehicle use, motorcycles and golf courses, where the vegetation is severely modified by excessive management (mowing, fertilizing and re-seeding) and drainage leading to drying out of the H2170, * scrub and invasive alien species encroachment which is exacerbated by a lack of grazing, * changes in hydrology and atmospheric N deposition. Changes to the local hydrology of the sand dune such as forestry plantations, drainage of adjacent land and abstraction. Climate change could pose a significant threat to the series of dune slacks in Europe. Most have been formed by natural sand movement but now lie within more stable dune systems. If water tables fall, as predicted in some areas, the habitat could be left 'high and dry' (Houston 2008). The lack of mobility and dynamism most dune systems in Wales are undergoing results in succession moving towards more stable \rank vegetation\ and undesirable scrub communities, probably exacerbated by increasing levels of eutrophication due in part to atmospheric pollution and possibly ground water contamination in places. SAC monitoring has revealed that many areas of the habitat are in poor condition (see 6.2), mostly due to successional development linked to increasing levels of stabilisation. 33% of the habitat is found in areas where the deposition of atmospheric nitrogen (2013-15 data) exceeds the Critical Load. Despite modest predicted declines in deposition levels for the UK, indications are that this will have little impact on the proportion of the habitat in areas of Critical Load exceedance in the medium-term. Projected deposition estimates for the welsh SACs on which H2130 is a feature in fact show a small (3%) rise in the area in Critical Load exceedance.
11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network	This is the total surface area of the feature within SACs (irrespective of whether the feature has been notified).
11.3 Surface area of the habitat type inside the network; Method used	The surface area figure for the habitat inside the SAC network has been derived from a number of sources (see Section 2.3) and mostly based upon an old data set (Sand Dune Vegetation Survey of Great Britain - Wales (Dargie, 1995)), which has been filtered to only include records containing SD16 (corresponding NVC community for the Annex I habitat type). The only contemporary data is for Kenfig where remote sensing data has been used to derive the extent of the H2170 habitat (Jones, 2017). It is very likely that the habitat has changed in extent on some sites due to vegetation succession and changes in management.
11.4 Short term trend of habitat area in good condition within the network; Direction	One of the four SACs supporting this feature has been concluded to be in 'favourable condition' for this reporting cycle, this SAC was also concluded to be in favourable condition in the 2007 - 2012 reporting round. The other three SACs supporting this feature have not been assessed during this reporting cycle but were monitored in both the 2000 -2006 and 2007 - 2012 reporting rounds, with their condition being reported as unfavourable on both occasions. On this basis the short-term trend of the habitat in good condition is reported as \stable\.