Supplementary text and tables on the extent of Ramsar wetland types in the UK

Extent figures are presented below in Tables A1/A2 and B1/B2 for inland and marine/coastal Ramsar wetland types that occur in the UK. This does not include the UK Overseas Territories or Crown Dependencies, apart from the Isle of Man for which figures are presented separately (see Table C1). The UK figures are based on a combination of published sources (Tables A1/A2) and novel analyses of selected GIS datasets (Tables B1/B2).

The approach assumed that, irrespective of their origin or past/current management/land-use: (i) the marine/coastal and inland wetland types A-Zk(b) are represented by wetland habitats that are of moderate-high biodiversity importance; and (ii) human-made Ramsar wetland types 1-9 and Zk(c) are represented by wetland habitats of low biodiversity importance. Although this potentially differs from (or is at least not made clear in) the explanatory information accompanying the Ramsar wetland classification, this interpretation aligns with the strategic focus of the Ramsar Convention, which is the wise use and conservation of wetlands. It also makes reporting on the extent of Ramsar wetland types more straightforward and meaningful.

Translation between the Ramsar wetland classification and UK classification systems proved to be problematic. The Ramsar wetland classification is a simple global classification system with only brief descriptions of the 42 types. It is intended to be comprehensive, but it is not always straightforward to use at a national level because of the lack of precision and apparent duplication between certain categories, and also certain omissions. It is recognised that the system was not intended as a general mechanism for national inventory purposes, and that its usefulness as a habitat classification for any specific wetland inventory should be carefully assessed, given that it does not readily accommodate descriptions of all wetland habitats that are now commonly included in national wetland inventories. Supporting contextual information provided by the Ramsar Convention on the Ramsar wetland types is limited and some of the sub-divisions are not commonly used in UK habitat classification systems. The intended scope of some of the sub-divisions is difficult to understand and alignment with potentially relevant UK wetland habitat types, which have been defined in different ways, is not always obvious or straight-forward.

To make the reporting on the extent of UK wetlands reasonably straightforward, a pragmatic approach was taken to the interpretation, scope and alignment of Ramsar wetland types with UK habitat types, particularly those for which readily available UK extent figures had already been produced for other purposes. As a result, some of the Ramsar wetland types were combined to report on their extent and some of the correspondences between the potential scope of Ramsar wetland types and UK habitat types were simplified.

Extent figures were not assembled for any human-made Ramsar wetland types. Types that did not appear to occur in the UK included: I. Intertidal forested wetlands; P. Seasonal/ intermittent freshwater lakes (over 8 ha); Q. Inland permanent saline/ brackish/alkaline lakes; R. Inland seasonal/ intermittent saline/brackish/ alkaline lakes and flats; Ss. Inland seasonal/ intermittent saline/brackish/ alkaline marshes/pools; Vt. Tundra wetlands; and Zg. Geothermal wetlands. It was assumed that type C. Coral Reefs did not include deep-sea cold-water coral reef or additional areas of biogenic reef

(created by, for example, reef forming worms, mussels, oysters and maerl) which occur in UK waters. In addition, it was unclear whether the Ramsar type Zk(a). Karst and other Subterranean hydrological systems occurred in the UK waters. Whilst it was clear which features this type covered in terrestrial settings (primarily limestone karst underground cave and tunnel systems), it was uncertain which habitat types/features it should encompass in the marine/coastal environment; although the Annex I type H8330 Submerged or partially submerged sea caves might be included, these are mainly formed through erosion of differential geology rather than any hydrological influence and are open to the sea. There are no known subterranean cave systems in the UK coastal environment. It was assumed that this type did not extend to deeper waters and is not intended to accommodate gaseous submarine systems/structures, produced where methane leaks form deep-water carbonate structures (covered by the Annex I type H1180 Submarine structures made by leaking gases).

Extent figures for the main wetland habitats in the Isle of Man are given in Table C1, based on a survey conducted between 1991-94 (https://www.gov.im/media/60296/daffphaseiecologicalsurveyrepor.pdf), as presented in the technical report accompanying the Isle of Man Wetland Inventory Executive Summary (Tomlinson, P., July 2007).

Table A1. UK extent figures (ha) for Ramsar wetland types based on published sources

Ramsar wetland type	England	Scotland	Wales	Northern Ireland	UK
E Sand, shingle or pebble shores	11,714	27,731	3,793	1,234	44,472
H Intertidal marshes	22,482	5,623	7,787	240	36,132
J Coastal brackish/saline lagoons	1,445	3,537	84	177	5,243
M Permanent rivers/streams, N Seasonal/ intermittent/irregular rivers/streams, L Permanent inland deltas	29,000	21,000	8,000	6,000	64,000
O Permanent freshwater lakes (over 8 ha), Tp(a) Permanent freshwater pools/ ponds (below 8 ha) on inorganic soils (not including marshes/swamps), Ts(a) Seasonal/ intermittent freshwater pools on inorganic soils (not including marshes/swamps), K Coastal freshwater lagoons, together with dystrophic pools/ponds <8 ha	97,000	88,000	18,000	64,000	265,000 (a)
Sp Inland permanent saline/brackish/alkaline marshes/pools	0.5	0	0	0	0.5
Tp(b) Permanent freshwater marshes/swamps on inorganic	594,518 (b)	2,423,312	204,390	246,191 (b)	3,477,589

soils (not including pools/ponds), Ts(b) Seasonal/ intermittent freshwater marshes/swamps on inorganic soil (not including pools/ ponds), U Non-forested peatlands, Va Alpine wetlands, Y Freshwater springs		(b)			(b)
W Shrub-dominated wetlands, Xf Tree-dominated wetlands, Xp Forested peatlands	20,000	44,742	12,200	2,600	79,542

(a) UK total is slightly less than the sum of the country figures due to rounding of figures and other methodological approaches used in Countryside Survey 2007
(b) the figures are incomplete as values for Reedbeds in Scotland and Upland fens, flushes and swamps in England and Northern Ireland were not available

Table A2. Corresponding habitat types and data sources used to derive extent figures shown in Table A1

Ramsar wetland type	Corresponding habitat types and (in brackets) data source
E	EU Habitats Directive Annex I habitat types H1210, H1220, H2110, H2120, H2130, H2140, H2150, H2160, H2170, H2190, H21A0, H2250 (JNCC Article 17 reporting 2019)
H	EU Habitats Directive Annex I habitat types H1310, H1320, H1330, H1420 (JNCC Article 17 reporting 2019)
J	EU Habitats Directive Annex I habitat type H1150 Coastal Lagoons (JNCC Article 17 reporting 2019)
M, N L	UK BAP Broad Habitat Rivers and Streams (Countryside Survey 2007)
O, Tp(a), Ts(a), K	UK BAP Broad Habitat Standing Water and Canals (Countryside Survey 2007)
Sp	EU Habitats Directive Annex I habitat type H1340 Inland salt meadows (JNCC Article 17 reporting 2019)
Tp(b), Ts(b), U, Va, Y	UK BAP Priority Habitat Reedbed (2008 UK BAP reporting round); Reedbed (NE State of Environment Report 2008); UK BAP Priority Habitat Lowland fen (2008 UK BAP reporting round); UK BAP Priority Habitat Upland flushes, fens and swamps (2008 UK BAP reporting round); Upland fen, marsh and swamp (Scotland's State of the Environment Report 2014); Upland fen, marsh and swamp (Natural Resources Wales (2016) State of Natural Resources Report), UK BAP Priority Habitat Purple moor grass and rush pastures (2008 UK BAP reporting round); Lowland marshy grassland (Purple Moor-grass and Rush Pastures) (Natural Resources Wales (2016) State of Natural Resources Report); H4010 Northern Atlantic wet heaths with *Erica tetralix* (JNCC Article 17 reporting 2019); H4020 Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix* (JNCC Article 17 reporting 2019); H4080 Sub-Arctic *Salix* spp. scrub (JNCC Article 17 reporting 2019); H6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (JNCC Article 17 reporting 2019); UK BAP Priority Habitat Lowland raised bog (2008 UK BAP reporting round); H7130 Blanket bogs (JNCC Article 17 reporting

	2019); UK BAP Priority Habitat Coastal and floodplain grazing marsh (2008 UK BAP reporting round); Coastal and floodplain grazing marsh (NE State of Environment Report 2008); UK BAP Priority Habitat Lowland meadows (2008 UK BAP reporting round)
W, Xf, Xp	UK BAP Priority Habitat Wet woodland (UK BAP reporting round 2008); Wet woodland (Native Woodland Survey of Scotland 2014)

Table B1. UK extent figure for Ramsar wetland types based on novel analyses of selected GIS datasets

Ramsar wetland type	Area (km^2)
A Permanent shallow marine waters less than six metres deep at low tide	7,769.45
B Marine subtidal aquatic beds	1,117.14
D Rocky marine shores	238.11
F Estuarine waters	3,149.09
G Intertidal mud, sand or salt flats	3,095.98
A Permanent shallow marine waters less than six metres deep at low tide, B Marine subtidal aquatic beds, D Rocky marine shores, F Estuarine waters, and G Intertidal mud, sand or salt flats	11,343.75 (a)

(a) this total combined extent of wetland types A, B, D, F and G (calculated via GIS) is less than the sum of the extent of each of the individual constituent wetland types, due to locations where two or more of the wetland types overlap.

Table B2. Description of datasets used to derive extent figure shown in Table B1

Ramsar wetland type	Description of dataset
A	The lowest limit of shallow marine waters was defined using an internally produced JNCC dataset (2019), produced from the Defra Digital Elevation Model, supplemented by the 2018 version of the EMODnet Bathymetry Digital Terrain Model where the Defra Digital Elevation Model was not available; the upper boundary was defined using chart datum based on a Defra Marine Reference Dataset held at JNCC, which contained polygons of the UK Hydrographic Office (UKHO) depth areas
B	Based on Essential Ocean Variable layers for: (i) macroalgal canopy and (ii) seagrass; obtained from the EMODnet Seabed Habitats web portal – note that maerl beds were not included as it was unclear if the intended scope of this type was meant to extend to algal coralline beds
D	Based on an extraction from the JNCC EUNIS Level 3 Combined Map for the UK of EUNIS habitat types: A1 Littoral rock and other hard substrata; and B3.1 Supralittoral rock (lichen or splash zone), supplemented with Phase 1 habitat data for Wales from Natural Resources Wales for H1.2 Intertidal mud/sand, H1.3 Intertidal boulders/rocks, and H.4 Boulders/rock above the high tide mark
F	Based on the Annex I habitat H1140 Mudflats and sandflats not covered by seawater at low tide shapefile produced by JNCC for the Habitats Directive 2019 UK Article 17 reporting
G	Based on the Annex I habitat H1130 Estuaries shapefile produced by JNCC for the Habitats Directive 2019 UK Article 17 reporting

Table C1. Extent of main wetland habitats in the Isle of Man

Broad habitat type	Area (ha)
Natural non-linear water bodies	7.3
Swamp	19.7
Man-made non-linear water bodies	132.4
Selected wet woodland and scrub	311.9
Wet heathland	342.4
Selected coastland	570.6
Mire	637.9
Marshy grassland	1,067.1
Intertidal	1,654.6
Shallow marine waters	13,915.4
Total	18,659.2