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Technical Documentation for the UK Biodiversity Indicator on the Extent of Natural Ecosystems: 2025 version

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Evidence Quality Assurance:

This document has been subject to appropriate levels of expert advice and quality control in compliance with JNCC's Evidence Quality Assurance Policy. It contributes to the UK Biodiversity Indicator 'Extent of Natural Ecosystems'. The UK Biodiversity Indicators are an accredited official statistics compendium, having been independently reviewed by the Office for Statistics Regulation in February 2012. They comply with the standards of trustworthiness, quality and value in the Code of Practice for Statistics.

Contents

1. Introduction

This report sets out the supporting documentation for the 2025 UK Biodiversity Indicator on the Extent of natural ecosystems.

It specifically provides details on each of the component ecosystem types used in the indicator. This includes correspondences to UK habitat/vegetation types, information sources or specific methods used to determine the extent figures, and various caveats and limitations, such as where the extent figure is based on a minimum value/is only partially accounted for. For some of the types, an explanation is given to clarify why a particular type has not been included in the extent figures for the indicator. The section on marine ecosystems includes information on the overall scope of marine ecosystems and overlapping marine ecosystem types.

2. Terrestrial ecosystem types

2.1. UK BAP habitat types

For some of the terrestrial ecosystem types, reference is made to the corresponding UK BAP priority habitat types, as defined under the former UK Biodiversity Action Plan (UK BAP) process and which continue to underpin the following country-level lists of 'priority habitats':

- the Section 41 list of Habitats of Principal Importance for the conservation of biological diversity in England
- the Northern Ireland list of Priority habitats
- the Scottish Biodiversity List of habitats of highest priority for biodiversity conservation in Scotland
- the Section 7 list of the Habitats of Principal Importance for the purpose of maintaining and enhancing biodiversity in relation to Wales

2.2. T2.1 Boreal and temperate high montane forests and woodland

2.2.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by native Scots pine woodland occurring within the native pinewood zone outside of the hyper-oceanic rainforest zone of west Scotland. It includes part of the Native pine woodlands UK BAP priority habitat type and H91C0 Caledonian forest Habitats Directive Annex I habitat type, and is mostly classified as NVC type W18.

The following have not been included under this ecosystem type:

- native pine woodland inside the rainforest zone that is included under T2.3 Oceanic cool temperate rainforests ecosystem type
- Scots pine woodland outside the native pinewood zone that fits under the T7.3 Plantations ecosystem type
- bog woodland dominated by Scots pine that is included under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type

2.2.2. Extent

The extent figure for this ecosystem type is 63,765 ha. This is based on occurrences of native pinewood (W18) recorded in the Native Woodland Survey of Scotland (2014) outside of the hyper-oceanic rainforest zone of west Scotland (which is covered by the T2.3 Oceanic cool temperate rainforests ecosystem type).

2.2.3. Information sources

- Patterson, G., Nelson, D., Robertson, P. and Tullis, J. (2014) Scotland's Native Woodlands - results from the Native Woodland Survey of Scotland. Forestry Commission Scotland, Edinburgh.

2.3. T2.2 Deciduous temperate forests

2.3.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by a range of native, semi-natural woodland types that are mostly dominated by deciduous broadleaved trees. This includes the following UK BAP priority habitat woodland types, where these occur outside of the rainforest zone (which is covered by the T2.3 Oceanic cool temperate rainforests ecosystem type), the main corresponding NVC types for which are W4a/b and W8-17:

- Lowland beech and yew woodland
- Lowland mixed deciduous woodland
- Upland birchwoods
- Upland mixed ashwoods
- Upland oakwoods
- Wood-pasture and parkland

Note that the extent to which Wood-pasture and parkland fits with the Global Ecosystem Typology forest types is uncertain, given that it varies from relatively open sites with scattered trees to denser stands with greater cover of trees and shrubs, with grazing by livestock/wild deer being the main factor affecting the habitat structure. Whilst it potentially fit better under T4 Savannas and grasslands biome/T4.4 Temperate woodlands ecosystem type, the Global Ecosystem Typology guidance emphasises that this type occurs in temperate climates with warm-season droughts and the distribution map does not show any occurrences north of the Mediterranean region.

The following have not been included under this ecosystem type:

- semi-natural broadleaved woodland within the rainforest zone that is included under the T2.3 Oceanic cool temperate rainforests ecosystem type
- wet woodland that is included under the TF1.2 Subtropical/temperate forested wetlands ecosystem type
- bog woodland that is included under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type
- plantations that lack semi-natural characteristics that fit under the T7.3 Plantations ecosystem type
- more open areas of wood-pasture and parkland and non-woodland occurrences of scrub that fell below the 20% canopy cover threshold and minimum area thresholds used in national woodland inventories/surveys
- areas of the juniper scrub (Habitats Directive Annex I habitat type H5130 *Juniperus communis* formations on heaths or calcareous grasslands) that are included under the T3.3 Cool temperate heathlands and T7.5 Derived semi-natural pastures and old fields ecosystem types
- hedgerows and traditional orchards that include some features of woodland ecosystems, but do not obviously fit under any of the Global Ecosystem Typology ecosystem types

2.3.2. Extent

The extent figure for this ecosystem type is 1,057,911 ha (area for England = 886,950 ha, Northern Ireland = 5,780 ha, Scotland = 119,802 ha, Wales = 45,379 ha). This is based on the following:

- the combined area of the following UK BAP Priority habitat types in England as reported in the NFI Woodland Ecological Condition assessment (Forestry Commission 2020; see also Natural England 2023a, 2023b):
    a. Lowland mixed deciduous woodland (*c*. 748,000 ha)
    b. Lowland beech and yew woodland (*c*. 54,500 ha)
    c. Upland mixed ashwoods (*c*. 32,000 ha) less an allowance of 3,200 ha for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type)
    d. Upland oakwoods (*c*. 44,000 ha) and birch-dominated upland oakwoods (11,220 ha) less an allowance of 7,300 ha for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type)
    e. Wood-pasture and parkland (*c*. 7,730 ha) which only includes sites with at least 20% canopy cover
- the combined area of the Upland oakwood (2,350 ha) and Upland mixed ashwoods (3,430 ha) UK BAP Priority habitat types in Northern Ireland as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008) – note that this includes some areas of woodland that likely occur in rainforest zone in Northern Ireland that have not been accounted for under the T2.3 Oceanic cool temperate rainforests ecosystem type
- the area of native woodland (confirming to NVC types W4, W8-11, W16-17) recorded in the Native Woodland Survey of Scotland (Patterson *et al*. 2014) outside the hyper-oceanic rainforest zone of west Scotland (see the T2.3 Oceanic cool temperate rainforests ecosystem type), excluding:
    a. native pine woodland (W18) included under the T2.1 Boreal and temperate high montane forests and woodlands ecosystem type
    b. wet woodland (W1-3, W5-W7) included under the TF1.2 Subtropical/temperate forested wetlands ecosystem type
- the combined area of the following UK BAP Priority habitat types in Wales:
    a. Lowland mixed deciduous woodland (12,000 ha) as reported in Jones *et al*. (2003)
    b. Upland mixed ashwood (17,000 ha) as reported in Jones *et al*. (2003), less an allowance of 12,285 ha to account for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type), assuming that 20% of the woodland in this zone is upland ashwood based on the average coverage of such woodland across Wales
    c. Lowland beech and yew woodland (3,450 ha) based on the Habitats Regulations Reporting (2025) for the Habitats Directive Annex I habitat types H9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*), H9130 *Asperulo-Fagetum* beech forests, and H91J0 *Taxus baccata* woods of the British Isles;
    d. Upland oakwoods (48,000 ha) based on the Habitats Regulations Reporting (2025) for the Habitats Directive Annex I habitat type H91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, less an allowance of 30,713 ha to account for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type), assuming that 50% of the woodland in this zone is upland oakwood based on the average coverage of such woodland across Wales); and

e. the area of the Wood-pasture and parkland UK BAP Priority habitat (7,927 ha across 211 wood-pasture/parkland sites) as recorded by the DataMapWales (2022)

2.3.3. Information sources

- Biodiversity Action Reporting System (2008) UK Habitat and Species Action Plans for Upland oakwood and Upland mixed ashwoods. Latest UK Status figures - 2008 reporting. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20100228131930/http://www.ukbap-reporting.org.uk/plans/national.asp
- DataMapWales (2022) Priority Habitats of Wales dataset (Environment (Wales) Act Section 7 Terrestrial Habitats of Principal Importance). Publication date 20 July 2022. https://datamap.gov.wales/layergroups/geonode:nrw_terrestrial_sections_7_habitats
- Defra (2023) A plan to recover England's temperate rainforests. Policy paper, Published 29 November 2023. Available at: https://www.gov.uk/government/publications/temperate-rainforest-strategy/a-plan-to-recover-englands-temperate-rainforests
- Forestry Commission (2020) NFI woodland ecological condition in England: classification results. National Forest Inventory, Forestry Commission, Edinburgh. Available at: https://cdn.forestresearch.gov.uk/2022/02/fr_nfi_condition_scoring-results_england.pdf
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- Jones, P.S., Stevens, D.P., Blackstock, T.H., Burrows, C.R. and E.A. Howe (Eds.) (2003) Priority Habitats of Wales - a technical guide. Countryside Council for Wales, Bangor.
- Natural England (2023a) Definition of Favourable Conservation Status for lowland mixed deciduous woodland. RP2960. Natural England. Available at: https://publications.naturalengland.org.uk/publication/6626832708009984
- Natural England (2023b) Definition of Favourable Conservation Status for upland mixed ashwoods. RP2978. Natural England. Available at: https://publications.naturalengland.org.uk/publication/6039470030454784
- Patterson, G., Nelson, D., Robertson, P. and Tullis, J. (2014) Scotland's Native Woodlands - results from the Native Woodland Survey of Scotland. Forestry Commission Scotland, Edinburgh.

2.4. T2.3 Oceanic cool temperate rainforests

2.4.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by areas of native woodland occurring in the Rainforest Zone as described in the reports on The State of Scotland's Rainforest (Alliance for Scotland's Rainforest 2022) and The State of Wales' Rainforest (Alliance for Wales' Rainforests 2024).

It includes parts of the following UK BAP priority habitat woodland types (where these occur within the rainforest zone), the main corresponding NVC types for which are W1, W4, W7, W9, W11 and W18:

- Upland birchwoods
- Upland mixed ashwoods
- Upland oakwoods
- Native pine woodlands
- Wet woodlands
- Wood-pasture and parkland

Note that the extent to which Wood-pasture and parkland fits with the Global Ecosystem Typology forest types is uncertain, given that it varies from relatively open sites with scattered trees to denser stands with greater cover of trees and shrubs, with grazing by livestock/wild deer being the main factor affecting the habitat structure. Whilst it potentially fit better under T4 Savannas and grasslands biome/T4.4 Temperate woodlands ecosystem type, the Global Ecosystem Typology guidance emphasises that this type occurs in temperate climates with warm-season droughts and the distribution map does not show any occurrences north of the Mediterranean region.

The following have not been included under this ecosystem type:

- bog woodland dominated by Scots pine that is covered under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type
- plantations that lack semi-natural characteristics that fit under the T7.3 Plantations ecosystem type
- more open areas of wood-pasture and parkland and non-woodland occurrences of scrub that fell below the 20% canopy cover threshold and minimum area thresholds used in national woodland inventories/surveys
- hedgerows that include some features of woodland ecosystems, but do not obviously fit under any of the Global Ecosystem Typology ecosystem types

2.4.2. Extent

The extent figure for this ecosystem type is 157,823 ha (area for England = 18,000 ha, Scotland = 78,397 ha, Wales = 61,426 ha). This is based on the following:

- the estimated area for temperate rainforest in England given by Defra (2023), which was derived from the map produced by the Lost Rainforests of Britain (2022)
- the area of temperate rainforest in Scotland located within the hyper-oceanic rainforest zone of the west coast of Scotland (as assessed by Averis 2023), based on an analysis of GIS data by NatureScot which is comparable to the calculation for The State of Scotland's Rainforest report (Alliance for Scotland's Rainforest 2022), but it also included recent woodland whereas the State of Scotland's Rainforest report only included woodland that overlapped with sites on the Ancient Woodland Inventory
- the area of temperate rainforest in Wales given in The State of Wales' Rainforest report (Alliance for Wales' Rainforests 2024) based on the extent of closed-canopy broadleaved woodland across the Welsh rainforest zone)

Note that information is not readily available on the boundaries of the rainforest zone or extent of woodland therein in Northern Ireland, so no attempt has been made to account for the extent of the T2.3 Oceanic cool temperate rainforests ecosystem type in Northern

Ireland. However, these areas are accounted for in the extent figures the T2.2 Deciduous temperate forests and TF1.2 Subtropical/temperate forested wetlands ecosystem types.

2.4.3. Information sources

- Alliance for Scotland's Rainforest (2022) The State of Scotland's Rainforest – Research report. The Woodland Trust Scotland, Perth. https://www.woodlandtrust.org.uk/media/51789/state-of-scotlands-rainforest.pdf
- Alliance for Wales' Rainforests / Cynghrair Dros Goedwigoedd Glaw Cymru (2024) The State of Wales' Rainforest. Available at: https://celticrainforests.wales/uploads/pdfs/State-of-Wales-Rainforest-Report-2024_ENG.pdf
- Averis, B. (2023) A Provisional Definition of Temperate Rainforest in Britain and Ireland. Unpublished report. Available at: https://www.benandalisonaveris.co.uk/wp/wp-content/uploads/2023/07/A-Provisional-Definition-of-Temperate-Rainforest-in-Britain-and-Ireland-Ben-Averis-2023-13-07-2023.pdf
- Defra (2023) A plan to recover England's temperate rainforests. Policy paper, Published 29 November 2023. Available at: https://www.gov.uk/government/publications/temperate-rainforest-strategy/a-plan-to-recover-englands-temperate-rainforests
- Lost Rainforests of Britain (2022) Map of the Lost Rainforests of Britain. Available at: https://lostrainforestsofbritain.org/2022/10/21/new-maps-reveal-britains-lost-rainforests/ [map published at https://map.lostrainforestsofbritain.org/; method published at https://map.lostrainforestsofbritain.org/Lost-Rainforests-Mapping-Methodology.pdf].

2.5. T3.3 Cool temperate heathlands

2.5.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by two UK BAP Priority habitat types, i.e. Lowland heathland and Upland heathland, the main corresponding NVC types for which are H1-12, H16, H18, H21, and M14-16. This includes occurrences of juniper scrub on H7 and H12 heath.

The Habitats Directive Annex I habitat types covered by this ecosystem types are:

- H4010 Northern Atlantic wet heaths with *Erica tetralix*
- H4020 Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*
- H4030 European dry heaths
- H4040 Dry Atlantic coastal heaths with *Erica vagans*
- H5130 *Juniperus communis* formations on heaths or calcareous grasslands – occurrences on acidic substrates

The following have not been included under this ecosystem type:

- heathland in the sub-montane zone that corresponds to the Habitats Directive Annex I H4060 Alpine and Boreal heaths habitat type (i.e. stands of H10/12/16/18/21 that are most extensive in Scotland and Wales), which are included in the T6.4 Temperate alpine grasslands and shrublands ecosystem type)

- coastal heathlands that are included under the MT2.1 Coastal shrublands and grasslands ecosystem type
- ericaceous vegetation on deeper peat soils that is included under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type

2.5.2. Extent

The extent figure for this ecosystem type is 1,254,889 ha. This is based on the Habitats Regulations Reporting (2025) and includes the area of the following Habitats Directive Annex I habitat types (area for England = 237,285 ha, Northern Ireland = 75,100 ha, Scotland = 850,350 ha, Wales = 92,154 ha):

- H4010 Northern Atlantic wet heaths with *Erica tetralix*
- H4020 Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*
- H4030 European dry heaths
- H4040 Dry Atlantic coastal heaths with *Erica vagans*
- H5130 *Juniperus communis* formations on heaths or calcareous grasslands – only occurrences on acidic substrates, which are estimated to cover *c*. 90% of the habitat area in Scotland and *c.* 75% in England

2.5.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

2.6. T3.4 Young rocky pavements, lava flows and screes

2.6.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by three UK BAP Priority habitat types, i.e. Limestone pavement, Inland rock outcrop and scree habitats (in part), and Calaminarian grasslands, the main corresponding NVC types for which are OV37-41, U16, and U18-21.

The following have not been included under this ecosystem type:

- artificial rock exposures unless these have developed semi-natural characteristics
- stone walls forming field boundaries, etc
- coastal cliffs/rocky slopes that are included under the MT2.1 Coastal shrublands and grasslands ecosystem type
- stands of H6430 Hydrophilous tall herb fringe communities, typically found on a combination of ungrazed upland cliff ledges and other open ground in the montane and sub-montane zone, which are included under the T6.4 Temperate alpine grasslands and shrublands ecosystem type
- open vegetation on stoney substrates with skeletal soils associated with the Open mosaic habitats on previously developed land UK BAP Priority habitat, which fit under the T7.4 Urban and industrial ecosystems type

2.6.2. Extent

The extent figure for this ecosystem type is 108,496 ha. This is based on the Habitats Regulations Reporting (2025) and includes the area of the following Habitats Directive Annex I habitat types (area for England = 7.842 ha, Northern Ireland = 460 ha, Scotland = 98,207 ha, Wales = 1,983.85 ha (note that for Wales the extent figure for H8110 is based on a minimum value):

- H6130 Calaminarian grassland
- H8110 Siliceous scree
- H8120 Calcareous and calcshist screes
- H8210 Calcareous rocky slopes
- H8220 Siliceous rocky slopes
- H8240 Limestone pavements

2.6.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

2.7. T6.3 Polar tundra and deserts

2.7.1. Corresponding UK habitat/vegetation types

This ecosystem type is not present in the UK, even though it is mapped in the North of Scotland in the Global Ecosystem Typology guidance. Whilst the Scottish Highlands region shares certain characteristics that resemble Arctic tundra landscapes (Averis *et al*. (2004) mention links to Arctic/tundra vegetation in a few places – see accounts for M19, M34 and U10 and Plate 12), it is not classified as a true tundra biome and is therefore included under T6.4 Temperate alpine grasslands and shrublands ecosystem type.

According to the EUNIS factsheet on Tundra, European tundras are limited to Spitzbergen and northern Russia, though vegetation with the same species also occurs on boreal mountains and in the low arctic remote from the main permafrost region, notably in Fennoscandia and Iceland (these oroboreal and low arctic habitats are categorised as alpine and subalpine grassland or arctic, alpine and subalpine scrub).

2.7.2. Information sources

- Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. (2004) An Illustrated Guide to British Upland Vegetation. JNCC, Peterborough. Available at: https://jncc.gov.uk/resources/a17ab353-f5be-49ea-98f1-8633229779a1

2.8. T6.4 Temperate alpine grasslands and shrublands

2.8.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by the Mountain heaths, willow scrub and montane grassland UK BAP Priority habitat type and parts of the Upland calcareous

grassland and Inland rock UK BAP Priority Habitat types. The main corresponding NVC types are CG12-14, H10, H12-22, U7-15, U17 and W20).

The Habitats Directive Annex I habitat types covered by this ecosystem type are:

- H4060 Alpine and Boreal heaths
- H4080 Sub-Arctic *Salix* spp. scrub
- H6150 Siliceous alpine and boreal grasslands
- H6170 Alpine and subalpine calcareous grasslands
- H6430 Hydrophilous tall herb fringe communities

Note that H4060 includes some sub-montane heathland (NVC types H10/12/16/18/21), most of which occurs in Scotland and Wales; H6170 includes some sub-montane grassland, but this is not extensive and a substantial part of the habitat occurs at high-altitude; and H6430 is also partly montane and partly sub-montane, but covers only a limited area.

The following have not been included in this ecosystem type:

- areas of montane H6230 Species-rich *Nardus* grassland that are included under the T7.5 Derived semi-natural pastures and old fields, because whilst some stands of this grassland type (mainly CG10-11, U4c, U5c) occur at higher altitudes, the majority is sub-montane and mostly covered by the UK BAP Upland calcareous grassland type
- other upland grassland types that are included under the T7.5 Derived semi-natural pastures and old fields
- areas of high-altitude flush vegetation, notably H7240 Alpine pioneer formations, which is a type of high-altitude flush mire found that is included under the TF1.7 Boreal and temperate fens ecosystem type

2.8.2. Extent

The extent figure for this ecosystem type is 114,660 ha. This is based on the Habitats Regulations Reporting (2025) and includes the area of the following Habitats Directive Annex I habitat types (area for England = 2,482.5 ha, Northern Ireland = 75 ha, Scotland = 111,902.5 ha, Wales = 200 ha):

- H4060 Alpine and Boreal heaths
- H4080 Sub-Arctic *Salix* spp. scrub
- H6150 Siliceous alpine and boreal grasslands
- H6170 Alpine and subalpine calcareous grasslands
- H6430 Hydrophilous tall herb fringe communities

2.8.3. Information sources

Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

2.9. T7.5 Derived semi-natural pastures and old fields

2.9.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by areas of extensively managed semi-natural grassland.

In the UK, it is represented by the following UK BAP Priority habitat types (main corresponding NVC types in brackets):

- Lowland calcareous grassland – all occurrences (CG1-10)
- Lowland dry acid grassland – all occurrences (U1-5, U20, SD10-12)
- Lowland meadows – all occurrences (MG1-2, MG4-5, MG8)
- Purple moor grass and rush pasture – all occurrences (M22-26)
- Upland calcareous grassland – all occurrences (CG9-11, U4-5)
- Upland hay meadows – all occurrences (MG3)
- Coastal and floodplain grazing marsh – only occurrences of semi-natural floodplain grassland in non-coastal situations (MG4, MG7c, MG8-11, MG13)

The Habitats Directive Annex I habitat types covered by this ecosystem types are:

- H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)
- H6230 Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)
- H6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- H6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
- H6520 Mountain hay meadows
- H2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands
- H5130 *Juniperus communis* formations on heaths or calcareous grasslands – only occurrences on calcareous (grassland) sites

Note that whilst some stands of H6230 Species-rich *Nardus* grassland occur at higher altitudes, the majority of this habitat is sub-montane and is mostly accounted for by the UK BAP Upland calcareous grassland type.

The following have not been included under this ecosystem type:

- coastal grazing marsh (mainly MG11b, 12-13), Machair grassland (mainly MG11) and other occurrences of semi-natural grassland in coastal situations (e.g. on shingle), which are best placed under the MT2.1 Coastal shrublands and grasslands ecosystem type (which also includes Coastal sand dunes, Coastal vegetated shingle, and Maritime cliffs and slopes)
- calaminarian grassland (mainly OV37), which is best placed under the T3.4 Young rocky pavements, lava flows and screes ecosystem type (which covers vegetation dominated by lichens/bryophytes with scattered shrubs that develops on skeletal rocky substrates – it also includes limestone pavement and inland rock/scree habitats)
- montane grassland, which is best placed under the T6.4 Temperate alpine grasslands and shrublands ecosystem type (which covers vegetation above the

climatic treeline and broadly incorporates mountain heaths, willow scrub and montane grassland – the latter includes all occurrences of the following Habitats Directive Annex I grassland habitat types, even though some stands may occur in the sub-montane zone: H6150 Siliceous alpine and boreal grasslands (U7-12, U14), H6170 Alpine and subalpine calcareous grasslands (CG12-14), and H6430 Hydrophilous tall herb fringe communities (U17))

- areas of H5130 *Juniperus communis* formations on acidic heathland sites that are included under the T3.3 Cool temperate heathlands ecosystem type
- areas of *Molinia*-dominated habitat (e.g. M25) on deep peat that are accounted for by the degraded raised bog component of TF1.6 Boreal, temperate and montane peat bogs ecosystem type
- areas of non-priority upland acid grassland on dry soils (U1-6) and non-priority upland species-poor marshy grassland on shallow peaty soils (M23, M25)
- small areas of semi-natural grassland associated with habitats such as field margins, hedgerows, open mosaic habitats on previously developed land, traditional orchards, and wood-pasture and parkland

2.9.2. Extent

The extent figure for this ecosystem type is 219,436 ha (area for England = 99,014 ha, Northern Ireland = 21,023 ha, Scotland = 17,175 ha, Wales = 82,224 ha). This is based on the following:

- the combined area of the following UK BAP Priority habitat types and Habitats Directive Annex I habitat types in England, as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008) or the Habitats Regulations Reporting (2025):
  a. H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (36,800 ha)
  b. Purple moor grass and rush pasture (21,544 ha)
  c. Lowland dry acid grassland (20,142 ha)
  d. Upland calcareous grassland (12,293 ha)
  e. Lowland meadows (7,282 ha)
  f. H6520 Mountain hay meadows (600 ha)
  g. H5130 *Juniperus communis* formations on heaths or calcareous grasslands – occurrences on calcareous substrates, which are estimated to cover *c*. 25% of the habitat area in England (1,411 x 25% ha = 353)
- the combined area of the following UK BAP Priority habitat types in Northern Ireland, as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008):
  a. Purple moor grass and rush pastures (18,476 ha)
  b. Lowland meadows (937 ha)
  c. Upland calcareous grassland (936 ha)
  d. Lowland dry acid grassland (674 ha)
- the combined area of the following UK BAP Priority habitat types and Habitats Directive Annex I habitat types in Scotland, as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008) or the Habitats Regulations Reporting (2025):
  a. Purple moor grass and rush pasture (6,768 ha)

b. Upland calcareous grassland (5,000 ha) less the area of H6170 Alpine and subalpine calcareous grasslands (680 ha) that is included under T6.4 Temperate alpine grasslands and shrublands ecosystem type
c. Lowland dry acid grassland (4,377 ha)
d. Lowland meadows (980 ha)
e. H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (674 ha)
f. H6520 Mountain hay meadows (56 ha)

- the combined area of the following UK BAP Priority habitat types in Wales, based on information supplied by Natural Resources Wales that involved a GIS interrogation of the Priority Habitat layers in an updated version of the DataMapWales (2022), which is mostly derived from the Terrestrial Phase 1 Habitat Survey of Wales (Blackstock *et al.* 2010), together with various updates and amendments from more recent surveys, including the Lowland Grassland Survey of Wales (Stevens *et al.* 2010)
  a. Lowland dry acid grassland (42,287 ha)
  b. Purple moor grass and rush pastures (36,550 ha)
  c. Lowland meadows (1,590 ha)
  d. Lowland calcareous grassland (929 ha)
  e. Upland calcareous grassland (868 ha)

2.9.3. Information sources

- Biodiversity Action Reporting System (2008). UK Habitat and Species Action Plans for Upland oakwood and Upland mixed ashwoods. Latest UK Status figures - 2008 reporting. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20100228131930/http://www.ukbap-reporting.org.uk/plans/national.asp
- Blackstock, T.H., Howe, E.A., Stevens, J.P., Burrows, C.R. and Jones, P.S. (2010) Habitats of Wales. A Comprehensive Field Survey, 1979-1997. University of Wales Press, Cardiff.
- DataMapWales (2022) Priority Habitats of Wales dataset (Environment (Wales) Act Section 7 Terrestrial Habitats of Principal Importance). Publication date 20 July 2022. https://datamap.gov.wales/layergroups/geonode:nrw_terrestrial_sections_7_habitats
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- Stevens, D.P., Smith, S.L.N., Blackstock, T.H., Bosanquet, S.D.S. and Stevens, J.P. (2010) Grasslands of Wales – A survey of lowland species-rich grasslands, 1987–2004. University of Wales Press, Cardiff.

2.10. TF1.2 Subtropical/temperate forested wetlands

2.10.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by native, semi-natural wet woodland on relatively fertile sites (i.e. excluding bog woodland). This includes part of Wet woodland UK BAP priority habitat type and NVC types W1-3, W4 (part), W5-6, and W7 (part).

The following have not been included under this ecosystem type:

- bog woodland dominated by Scots pine that is included under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type
- wet woodland in the rainforest zone that is included under the T2.3 Oceanic cool temperate rainforests ecosystem type
- plantations that lack semi-natural characteristics that fit under the T7.3 Plantations ecosystem type
- more open areas of wood-pasture and parkland and non-woodland occurrences of scrub that fell below the 20% canopy cover threshold and minimum area thresholds used in national woodland inventories/surveys

2.10.2. Extent

The extent figure for this ecosystem type is 114,759 ha (area for England = 70,500 ha, Northern Ireland = 2,600 ha, Scotland = 38,802 ha, Wales = 2,857 ha). This is based on the following:

- the area of the Wet woodland UK BAP Priority habitat types in England (c.78,000 ha) as reported in the NFI Woodland Ecological Condition assessment (Forestry Commission 2020; see also Natural England 2023c) less an allowance of 7,500 ha for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type)
- the combined area of the Wet woodland (2,600 ha) UK BAP Priority habitat type in Northern Ireland as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008) – note that this includes some areas of woodland that likely occur in the rainforest zone in Northern Ireland that have not been accounted for under the T2.3 Oceanic cool temperate rainforests ecosystem type
- wet woodland (confirming to NVC types W1-3, W5-7) recorded in the Native Woodland Survey of Scotland (Patterson *et al.* 2014) outside the hyper-oceanic rainforest zone of west Scotland (see the T2.3 Oceanic cool temperate rainforests ecosystem type)
- the area of the Wet woodland UK BAP Priority habitat type in Wales (c.9,000 ha) as reported in Jones *et al.* (2003), less an allowance of 6,143 ha to account for such woodland in the rainforest zone (which is included under the T2.3 Oceanic cool temperate rainforests ecosystem type), assuming that 10% of the woodland in this zone is wet woodland based on the average coverage of such woodland across Wales

2.10.3. Information sources

- Biodiversity Action Reporting System (2008). UK Habitat and Species Action Plans for Upland oakwood and Upland mixed ashwoods. Latest UK Status figures - 2008

reporting. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20100228131930/http://www.ukbap-reporting.org.uk/plans/national.asp
- Forestry Commission (2020) NFI woodland ecological condition in England: classification results. National Forest Inventory, Forestry Commission, Edinburgh. Available at: https://cdn.forestresearch.gov.uk/2022/02/fr_nfi_condition_scoring-results_england.pdf
- Jones, P.S., Stevens, D.P., Blackstock, T.H., Burrows, C.R. and E.A. Howe (Eds.) (2003) Priority Habitats of Wales - a technical guide. Countryside Council for Wales, Bangor.
- Natural England (2023c) Definition of Favourable Conservation Status for wet woodland. RP2969. Natural England. Available at: https://publications.naturalengland.org.uk/publication/4744734552358912
- Patterson, G., Nelson, D., Robertson, P. and Tullis, J. (2014) Scotland's Native Woodlands - results from the Native Woodland Survey of Scotland. Forestry Commission Scotland, Edinburgh.

2.11. TF1.3 Permanent marshes

2.11.1. Corresponding UK habitat/vegetation types

This type does not occur in the UK given that the information in the Global Ecosystem Typology guidance: (a) states that this ecosystem type includes extensive areas of shallow, permanently inundated freshwater marshes (dominated by emergent macrophytes growing in often monospecific groves of rhizomatous grasses, sedges, rushes or reeds in mosaics with patches of open water and little or no woody vegetation); and (b) the shows the nearest locations to the UK are in southern France and northern Italy where very large areas of permanent marsh occur. All UK marshes have therefore been covered under the TF1.7 Boreal and temperate fens ecosystem type.

2.12. TF1.6 Boreal, temperate and montane peat bogs

2.12.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is mostly represented by the Blanket bog and Lowland raised bog UK BAP Priority habitat types, which are covered by four Habitats Directive Annex I habitat types:

- H7110 Active raised bogs
- H7120 Degraded raised bogs still capable of natural regeneration
- H7130 Blanket bogs
- H7150 Depressions on peat substrates of the *Rhynchosporion*

The corresponding NVC types are M1-3, M15-21, M25, M29 and A24 for open bogs, whilst stands of bog woodland form mixtures of M17-19 and W2b/W4c/W18.

Note that H7120 includes sites where the hydrology can be repaired and where, with appropriate rehabilitation management, there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years (typically the original bog vegetation has been impoverished and, occasionally, sites can support non-bog vegetation, including areas of bare peat, pasture, scrub/woodland, or even conifer plantations). In addition, whilst H7150 can occur in transition mires, in mosaics with lowland wet heath and valley mire

vegetation, or the margins of bog pools and hollows in both raised and blanket bogs, it is mostly associated with acidic, nutrient-poor bogs, rather than relatively base-rich fen sites.

This ecosystem type also includes the Habitats Directive Annex I H91D0 Bog woodland habitat type, which forms part of the Wet woodland UK BAP Priority habitat type and includes open woodland stands on bog or (more rarely) poor fen (ranging from bog woodland dominated by Scots pine in Scotland to fragmentary stands of birch/willow bog woodland on valley mire sites in other parts of the UK).

The following have not been included in this ecosystem type:

- heathland vegetation on shallower peat soils that are included under the T3.3 Cool temperate heathlands ecosystem type
- poor fens that are included under the TF1.7 Boreal and temperate fens ecosystem type
- stands of semi-natural woodland on peaty soils that are included under the TF1.2 Subtropical/temperate forested wetlands, T2.2 Deciduous temperate forests and T2.3 Oceanic cool temperate rainforests forest ecosystem types

2.12.2. Extent

The extent figure for this ecosystem type is 2,327,351 ha. This is based on the Habitats Regulations Reporting (2025) and includes the area of the following Habitats Directive Annex I habitat types (area for England = 346,564 ha, Northern Ireland = 148,882 ha, Scotland = 1,776,051 ha, Wales = 55,854 ha):

- H7110 Active raised bogs
- H7120 Degraded raised bogs still capable of natural regeneration
- H7130 Blanket bogs
- H7150 Depressions on peat substrates of the *Rhynchosporion*
- H91D0 Bog woodland

Note that the extent figure for H91D0 Bog woodland in Scotland is based on the area within the SAC network (= 400 ha), the extent figures used for H7150 in England and Wales are minimum values, and no extent figure is available for H7150 in Northern Ireland.

2.12.3. Information sources

Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

2.13. TF1.7 Boreal and temperate fens

2.13.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by three UK BAP priority habitats: Lowland fens; Reedbeds; and Upland flushes, fens and swamps.

The Habitats Directive Annex I habitat types that are covered by this ecosystem types are:

- H7140 Transition mires and quaking bogs

- H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
- H7220 Petrifying springs with tufa formation
- H7230 Alkaline fens
- H7240 Alpine pioneer formations

The corresponding NVC types are: M1-6, M9-10, M13-14, M21, M27-30, M36-37, S1-3, S5-25, S27-28 (for lowland fens); S4, S24-27 (for reedbeds); and M14, M21, M23/25 (species-rich forms), M27-35, M37-38, S3, S9-11, S19, S27, U6 (herb-rich forms) (for upland flushes, fens and swamps).

The following have not been included in this ecosystem type:

- bog and wet heath vegetation on peat soils that are included under the T3.3 Cool temperate heathlands and TF1.6 Boreal, temperate and montane peat bogs ecosystem types
- occurrences of H7150 in relatively base-rich fen sites that are included under the TF1.6 Boreal, temperate and montane peat bogs ecosystem type
- stands of semi-natural woodland on fen sites that are included under the TF1.2 Subtropical/temperate forested wetlands ecosystem type and T2.3 Oceanic cool temperate rainforests ecosystem types

2.13.2. Extent

The extent figure for this ecosystem type is 76,379 ha (England = 40,808 ha, Northern Ireland = 5,096 ha, Scotland = 8655 ha, Wales = 21,820 ha). This is based on data from:

- the Priority Habitats Inventory for England (Natural England 2025), including all entries for the following main habitat types: Lowland fens (18,662.8 ha); Lowland fen, Reedbeds (1,564.6 ha); Reedbeds (3,015.5 ha); and Upland flushes fens and swamps (17,564.9 ha)
- the combined area of the Lowland fen (3,000 ha) and Reedbeds (2,096 ha) UK BAP Priority habitat types in Northern Ireland, as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008)
- the combined area of the following UK BAP Priority habitat type and Habitats Directive Annex I habitat type in Scotland, as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008) or the Habitats Regulations Reporting (2025): Lowland fens (8,585 ha); and H7240 Alpine pioneer formations (70 ha)
- the Priority Habitats of Wales dataset (DataMapWales 2022) (which is derived from the Wales Phase 1 Terrestrial habitat survey, Blackstock *et al*. 2010), including all entries for Lowland fen and Reedbeds (6,613.65 ha) and Upland fens, flushes and swamps (15,205.99 ha)

Note that no information is available on the extent of:

- upland fens, flushes and swamps in Northern Ireland
- reedbeds and upland fens, flushes and swamps in Scotland (other than those covered by the Habitats Directive Annex I habitat type H7140 Transition mires and quaking bogs)

2.13.3. Information sources

- Biodiversity Action Reporting System (2008). UK Habitat and Species Action Plans for Upland oakwood and Upland mixed ashwoods. Latest UK Status figures - 2008 reporting. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20100228131930/http://www.ukbap-reporting.org.uk/plans/national.asp
- Blackstock, T.H., Howe, E.A., Stevens, J.P., Burrows, C.R. and Jones, P.S. (2010) Habitats of Wales. A Comprehensive Field Survey, 1979-1997. University of Wales Press, Cardiff.
- DataMapWales (2022) Priority Habitats of Wales dataset (Environment (Wales) Act Section 7 Terrestrial Habitats of Principal Importance). Publication date 20 July 2022. Available at: https://datamap.gov.wales/layergroups/geonode:nrw_terrestrial_sections_7_habitats
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- Natural England (2025) Priority Habitats Inventory (England). Publication date:3 July 2025. Available at: https://www.data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitats-inventory-england

2.14. F1.1 Permanent upland streams

2.14.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by a range of upland rivers and streams that are generally located upstream of areas of intensive land use. These form part of the Rivers UK BAP Priority habitat type, which encompasses all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in natural systems).

The following have not been included under this ecosystem type:

- lowland rivers/streams that are included under the F1.2 Permanent lowland rivers ecosystem type
- anthropogenic watercourses that fit are included under the F3.5 Canals, ditches and drains ecosystem type
- river floodplains and other wetlands adjoining riverine ecosystems

Note that a limited number of upland rivers/streams included under this type have marked seasonal flows. This is because there is no clear evidence to suggest that these ought to be included under the F1.4 Seasonal upland streams ecosystem type, given that the Global Ecosystem Typology guidance is unclear as to how seasonal watercourses ought to be defined and separated from permanent watercourses and there is no readily available UK dataset to do this.

2.14.2. Extent

The extent figure for this ecosystem type is 30,918 km (England = 10,349 km, Northern Ireland = 724 km, Scotland = 17,253 km, Wales = 2,592 km) (the units used for this type are length, rather than area, because there is no obvious way of converting river length figures to area values – it therefore does not contribute to the headline indicator figures). The figure

is based on the river classification datasets used for the Water Framework Directive (Cycle 1) reporting for England, Northern Ireland, Scotland and Wales. Rivers in the mid-altitude (200–800 m) and high-altitude (> 800 m) catchment categories (as defined by the Water Framework Directive UK typology for rivers for Scotland, England and Wales – see UK Technical Advisory Group 2003) were counted as upland watercourses.

Note that these datasets only include the wider river lengths as shown on the Ordnance Survey 1:50,000 scale maps (i.e. they do not include numerous smaller tributaries), so the length figure is an under-estimate of the actual length of lowland watercourses.

2.14.3. Information sources

- UK Technical Advisory Group (2003) UK Technical Advisory Group on the Water Framework Directive Guidance on Typology for Rivers for Scotland, England and Wales (Final Working Paper). UKTAG Work Program – Task 2a. Typology for Rivers. Available at: https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Rivers%20typology_Final_050603.pdf
- Dataset for England provided by the Environment Agency/Natural England.
- Dataset for Northern Ireland provided by DAERA.
- Dataset for Scotland shown on Scotland's Environment Map Available at: https://map.environment.gov.scot/sewebmap/ provided by the Scottish Environment Protection Agency (see also https://www.sepa.org.uk/environment/environmental-data/#:~:text=River%20Classifications)
- Dataset for Wales provided by Natural Resources Wales.

2.15. F1.2 Permanent lowland rivers

2.15.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by a range of lowland rivers and streams that are generally located within areas of intensive land use. These form part of the Rivers UK BAP Priority habitat type, which encompasses all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in natural systems).

The following have not been included under this ecosystem type:

- upland rivers/streams that are included under the F1.1 Permanent upland streams ecosystem type
- anthropogenic watercourses, including canals, ditches and drains
- river floodplains and natural wetlands adjoining riverine ecosystems

Note that a limited number of upland rivers/streams included under this type have marked seasonal flows. This is because there is no clear evidence to suggest that these ought to be included under the F1.4 Seasonal upland streams ecosystem type, given that the Global Ecosystem Typology guidance is unclear as to how seasonal watercourses ought to be defined and separated from permanent watercourses and there is no readily available UK dataset to do this.

2.15.2. Extent

The extent figure for this ecosystem type is 55,858 km (England = 37,275 km, Northern Ireland = 4,409 km, Scotland = 9,066 km, Wales = 5,108 km) (the units used for this type are length, rather than area, because there is no obvious way of converting river length figures to area values – it therefore does not contribute to the headline indicator figures). The figure is based on the river classification datasets used for the Water Framework Directive (Cycle 1) reporting for England, Northern Ireland, Scotland and Wales. Rivers in the low-altitude (< 200 m) catchment category (as defined by the Water Framework Directive UK typology for rivers for Scotland, England and Wales – see UK Technical Advisory Group 2003) were counted as lowland watercourses.

Note that these datasets only include wider river lengths as shown on the Ordnance Survey 1:50,000 scale maps (i.e. they do not numerous smaller tributaries), so the length figure is an under-estimate of the actual length of lowland watercourses.

2.15.3. Information sources

- UK Technical Advisory Group (2003) UK Technical Advisory Group on the Water Framework Directive Guidance on Typology for Rivers for Scotland, England and Wales (Final Working Paper). UKTAG Work Program – Task 2a. Typology for Rivers. Available at: https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Rivers%20typology_Final_050603.pdf
- Dataset for England provided by the Environment Agency/Natural England.
- Dataset for Northern Ireland provided by DAERA.
- Dataset for Scotland shown on Scotland's Environment Map Available at: https://map.environment.gov.scot/sewebmap/ provided by the Scottish Environment Protection Agency (see also https://www.sepa.org.uk/environment/environmental-data/#:~:text=River%20Classifications)
- Dataset for Wales provided by Natural Resources Wales.

2.16. F1.3 Freeze-thaw rivers and streams

2.16.1. Corresponding UK habitat types

There is no clear evidence to suggest that this ecosystem type exists in the UK. Whilst some high-altitude streams in The Cairngorms mountain range (Scotland) might fit, these are very limited in extent and cannot be readily identified based on available information.

2.17. F1.4 Seasonal upland streams and F1.5 Seasonal lowland rivers

2.17.1. Corresponding UK habitat types

There is no clear evidence to suggest that these ecosystem types exist in the UK. Whilst there are watercourses that have marked seasonal flows (e.g. winterbournes), the Global Ecosystem Typology guidance for F1.4 and F1.5 is unclear as to how seasonal watercourses ought to be defined and separated from permanent watercourses and there is no readily available UK dataset to do this. All UK rivers and streams have therefore been

reported under the F1.1 Permanent upland streams and F1.2 Permanent lowland rivers ecosystem types.

2.18. F2.1 Large permanent freshwater lakes

2.18.1. Corresponding UK habitat types

The only UK lake that is significantly greater in area than the general 100 km^2 threshold for small versus large lakes (as stated in the Global Ecosystem Typology guidance for this ecosystem type) is Lough Neagh, Northern Ireland. The next largest lake is Lough Erne, Northern Ireland, which has been included under the F2.2 Small permanent freshwater lakes ecosystem type, as it is only slightly over the size threshold at 103.84 km^2 and comparable to other lakes include under this type.

2.18.2. Extent

The extent figure for this ecosystem type is 38,179 ha. This is based on the lake surface area for Lough Neagh as given on the UK Lakes Portal (381.79 km^2) (UKCEH 2025).

2.18.3. Information sources

- UKCEH (2025) UK Lakes Portal website. Available at: https://uklakes.ceh.ac.uk/

2.19. F2.2 Small permanent freshwater lakes

2.19.1. Corresponding UK habitat types

Almost all UK freshwater lakes, lochs, pools and ponds fit under this ecosystem type, as they are less than the general 100 km^2 threshold for small versus large lakes (as stated in the Global Ecosystem Typology guidance for this ecosystem type. These cover a vast ecological range including the following UK BAP Priority habitat types:

- Eutrophic standing waters
- Mesotrophic lakes
- Oligotrophic and dystrophic lakes
- Ponds

The following have not been included under this ecosystem type:

- a single large lake that is included under the F2.1 Large permanent freshwater lakes ecosystem type
- a limited number of seasonal standing waterbodies that are included under the F2.3 Seasonal freshwater lakes ecosystem type
- anthropogenic standing waterbodies, including artificial reservoirs and ponds that are anthropogenic in origin and lack natural features/functions, and are covered by one of the F3 Artificial wetlands biome ecosystem types
- natural wetlands adjoining lakes that are covered by the TF1.2 Subtropical/temperate forested wetlands, TF1.6 Boreal, temperate and montane peat bogs and TF1.7 Boreal and temperate fens ecosystem types

2.19.2. Extent

The extent figure for this ecosystem type is 220,492 ha (area for England = 46,119 ha, Northern Ireland = 20,973 ha, Scotland = 147,082 ha, Wales = 6,318 ha). This includes the following:

- the area of lakes in England (31,078 ha) based on the Habitats Regulations Reporting (2025) for six freshwater Habitats Directive Annex I habitat types (H3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*); H3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of *the Isoëto-Nanojuncetea*; H3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.; H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation; H3160 Natural dystrophic lakes and ponds); combined with an area estimate for ponds in England (15,041 ha) based on the information published in Table 3.2 in the Countryside Survey Pond Report from 2007 (Williams *et al*. 2010), multiplying the estimated number of ponds in each size-class by the lower quartile for the range in area for each class
- the area of lakes (> 2 ha) in Northern Ireland (19,912 ha) based on the Northern Ireland Lake Survey (DAERA 2025) and current Ordnance Survey Northern Ireland basemaps (transboundary waterbodies were clipped to the Northern Ireland boundary and artificial waterbodies (reservoirs/dams) were excluded based on expert judgment); combined with an area estimate for ponds (< 2 ha in area) in Northern Ireland (1,061 ha) based on OSNI basemaps and the Northern Ireland Lake Survey data (DAERA 2025) (this is a conservative estimate as this dataset provides poor coverage of smaller ponds)
- the area of lakes in Scotland from the UK Lakes Portal (147,082 ha); combined with an area estimate for ponds in Scotland (10,668 ha) based on the information published in Table 3.2 in the Countryside Survey Pond Report from 2007 (Williams *et al*. 2010) (multiplying the estimated number of ponds in each size-class by the lower quartile for the range in area for each class)
- the combined area of lakes in Wales (3,765 ha) as presented in Hatton-Ellis (2014) (excluding the 'Unlikely to match a BAP category' and 'Destroyed' lakes categorises; combined with an area estimate for ponds in Wales (2,553 ha) based on standing waters < 2ha in area as shown on Ordnance Survey MasterMap (Hatton-Ellis 2023)

2.19.3. Information sources

- DAERA (2025) Lakes of Northern Ireland OpenData portal. Available at https://opendata-daerani.hub.arcgis.com/datasets/DAERANI::lakes-of-northern-ireland/explore
- Froglife Scottish Pond Mapping. Available at: https://www.froglife.org/wp-content/uploads/2021/04/Scottish-Pond-Mapping.pdf
- Hatton-Ellis, T.W. (2014) Lake BAP Priority Areas in Wales – a Strategic Overview. Wales Biodiversity Partnership Freshwater Ecosystem Group Report. Natural Resources Wales, Bangor.
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- Hatton-Ellis, T.W. (2023) Draft Inventory of Welsh Ponds. Unpublished data held by Natural Resources Wales.

- UKCEH (2025) UK Lakes Portal website. Available at: https://uklakes.ceh.ac.uk/
- Williams, P., Biggs, J., Crowe, A., Murphy, J., Nicolet, P., Weatherby, A., and Dunbar, M. (2010) Countryside Survey: Ponds Report from 2007. CS Technical Report No. 7/07, CEH Project Number: C03259. NERC/Centre for Ecology and Hydrology.

2.20. F2.3 Seasonal freshwater lakes

2.20.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by a limited number pf standing waterbodies lakes that regularly dry up, including:

- Mediterranean temporary ponds that consist of winter-flooded areas, which dry out to give vegetation rich in annuals – The Lizard peninsular is the only area in the UK that contains significant areas of this habitat type
- turloughs that are seasonally flooded lakes in karstic areas of Carboniferous limestone in Northern Ireland and Wales, which have no natural surface outlet and are principally filled by subterranean waters via ephemeral springs that drain back into the groundwater table
- fluctuating meres that occur over chalk bedrock in the Norfolk Breckland, East Anglia
- temporary pools in the New Forest, southern England
- other small seasonal pools and ponds

The first two are covered by the Aquifer Fed Naturally Fluctuating Water Bodies UK BAP Priority habitat type; the others fit under the Eutrophic standing waters, Mesotrophic lakes, Oligotrophic and dystrophic lakes, and Ponds UK BAP Priority habitat types.

Note that whilst there are a number of other small seasonal pools and ponds that potentially fit under this ecosystem types, the Global Ecosystem Typology guidance is unclear as to how seasonal standing waterbodies ought to be defined and separated from permanent standing waterbodies and there is no readily available UK dataset to do this. Most UK lakes, pools and ponds have therefore been reported under the F2.2 Small permanent freshwater lakes ecosystem type.

The following have not been included under this ecosystem type:

- permanent fresh waterbodies that are covered by the F2.1 Large permanent freshwater lakes and F2.2 Small permanent freshwater lakes ecosystem types
- dune slacks are covered by the MT2.1Coastal shrublands and grasslands ecosystem type
- anthropogenic standing waterbodies, including artificial reservoirs and ponds that are anthropogenic in origin and lack natural features/functions, and are covered by one of the F3 Artificial wetlands biome ecosystem types
- natural wetlands adjoining seasonal lakes that are covered by the TF1.2 Subtropical/temperate forested wetlands, TF1.6 Boreal, temperate and montane peat bogs and TF1.7 Boreal and temperate fens ecosystem types

2.20.2. Extent

The extent figure for this ecosystem type is 41 ha (area for England = 36.5 ha, Northern Ireland = 3.96 ha, Scotland = 0 ha, Wales = 0.66 ha). This is based on the following:

- the area of the Habitats Directive Annex I habitat types H3170 Mediterranean temporary ponds (10 ha in England) and H3180 Turloughs (3.96 ha in Northern Ireland, 0.66 ha in Wales) from the Habitats Regulations Reporting (2025)
- the area of five fluctuating meres in Norfolk (Langmere and Ringmere 5.5 ha, Fowlmere 8.6 ha, Devil's Punchbowl 1.2 ha, Homemere 1.2 ha) as reported under the 2008 UK BAP reporting round via the Biodiversity Action Reporting System (2008)
- the area of temporary pools in the New Forest SAC (*c.* 10 ha) as reported by JNCC (2025)

2.20.3. Information sources

- Biodiversity Action Reporting System (2008). UK Habitat and Species Action Plans for Aquifer-fed fluctuating water bodies. Latest UK Status figures - 2008 reporting. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20100228131930/http://www.ukbap-reporting.org.uk/plans/national.asp
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- JNCC (2025) The New Forest - Designated Special Area of Conservation (SAC). Available at: https://sac.jncc.gov.uk/site/UK0012557

2.21. F2.4 Freeze-thaw freshwater lakes

2.21.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by 21 high-altitude lochs in Scotland. These include Lochnagar, which is a high-altitude lake that freezes for a month in most years (based on information collected via the UK Upland Waters Monitoring Network). An additional 21 Scottish lochs identified in the UK Lakes Portal (UKCEH 2025) have the same altitude or higher, 20 of which (as listed below in Table 1) are considered to conform to this ecosystem type in that they likely freeze for a month in most years (the exception is Loch Etchachan, NGR NJ006003, UK Lakes Portal Water Body ID 21156, which is larger and therefore less likely to freeze over completely).

2.21.2. Extent

The extent figure for this ecosystem type is 77 ha based on the lake surface areas (as recorded in the UKCEH Lakes Portal database) of the 21 lakes listed above.

2.21.3. Information sources

- UK Upland Waters Monitoring Network. Available at: https://uwmn.uk/
- UKCEH (2025) UK Lakes Portal website. Available at: https://uklakes.ceh.ac.uk/

Table 1: List of freeze-thaw freshwater lakes.

Lake name	National Grid Reference	UK Lakes Portal Water Boby ID	Altitude (m)	Area (ha)
Dubh Lochan	NO096991	21220	937	5.1
Gorm Lochan	NH124132	20510	818	1.6
Loch a' Choire Dhomhain	NH139267	19610	927	1.7
Loch Coire an Lochain	NH942004	21160	996	9.1
Loch Coire Cheap	NN479755	22061	803	3.9
Loch nan Cnapan	NN917960	21342	864	2.1
Loch nan Eun	NO229853	21755	898	7.6
Loch nan Stuirteag	NN941957	21350	864	4.1
Loch Uaine	NH122256	19685	908	1.2
Lochan Coire Choille-rais	NN433867	21676	808	7.4
Lochan Dubh Lochan	NO101994	21208	847	1.2
Lochan Meoigeach	NN452641	22529	828	1.9
Lochan Uaine	NO001980	21265	956	3.8
Lochan Uaine	NN959979	21270	918	5.2
Lochan Uaine	NN420881	21631	907	2.2
Lochan Uisge	NH634038	20930	866	1.1
Lochnagar	NO252859	21723	788	9.9
Sandy Loch	NO228864	21701	796	4.5
Unnamed lake	NH254562	16567	795	1.4
Unnamed lake	NH993032	20985	927	1.1
Unnamed lake	NJ070006	21151	876	1.1

2.22. F2.8 Artesian springs and oases

2.22.1. Corresponding UK habitat types

It is unclear whether any UK groundwater-fed waterbodies ought to be included under this ecosystem type. Whilst groundwater-fed lake systems exist in the UK (e.g. on limestone), the Global Ecosystem Typology guidance indicate that this type includes waterbodies fed by the flow of artesian water to the surface (with little input from precipitation or runoff) in regions with an arid climate, including southern Africa, the Sahara, the Middle East, central Eurasia, southwest of North America, and Australia's Great Artesian Basin. In addition, it does not seem appropriate to include it given that information on it is limited, it is problematic to define and assess, and will frequently be overlain by other ecosystem types.

2.23. MFT1.3 Coastal saltmarshes and reedbeds

2.23.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by the Coastal saltmarsh UK BAP Priority habitat type, the main corresponding NVC types for which are SM2-5 and SM7-28, together with associated stands of M28, MG11-13, S4, S19-21 and S26.

The Habitats Directive Annex I habitat types covered by this ecosystem types are:

- H1310 *Salicornia* and other annuals colonising mud and sand
- H1320 *Spartina* swards (*Spartinion maritimae*)
- H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- H1420 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)

The following have not been included under this ecosystem type:

- mud/sand flats and shorelines, which are included under the MT1.2 Muddy Shorelines and MT1.3 Sandy Shorelines ecosystem types

2.23.2. Extent

The extent figure for this ecosystem type is 50,164 ha. This is based mostly on data from: (a) the updated England National Saltmarsh Inventory (Environment Agency 2022); (b) the Habitats Regulations Reporting (2025) for Northern Ireland, Scotland and Wales; and (c) the Phase 2 Saltmarsh Survey of Wales (Natural Resources Wales 2022).

The figure for England (35,507 ha) includes the following saltmarsh zonation classes:

- Pioneer = 1,534.05 ha
- Mid-low = 18,343.40 ha
- Upper = 7,339.26 ha
- Estuarine reedbeds = 888 ha
- *Spartina* = 2,719.69 ha
- Unclassified – areas of accretion or unmapped saltmarsh (not mapped to zonation level) = 4,469.66 ha
- Unvegetated – areas such as salt pans, creeks, and fragmented vegetation that fall below the minimum mappable unit = 213.19 ha

The figures for Northern Ireland (240 ha), Scotland (5,623 ha) and Wales (7,656 ha) include the following Habitats Directive Annex I habitat types:

- H1310 *Salicornia* and other annuals colonising mud and sand
- H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- H1420 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)

In addition, estuarine reedbeds have been accounted for using figures from:

- the Scottish saltmarsh survey national report, which gives a figure of 431 ha of brackish reed-swamp (NVC type S4) occurring on the Tay Estuary (310 ha), Solway Firth (103 ha), and The Clyde (18 ha)

- the Phase 2 Saltmarsh Survey of Wales, which recorded *c*. 114 ha of coastal saltmarsh reedbeds (NVC type S4 or S26, sometimes growing in mosaic with SM13/SM16/SM24/SM28)

Allowance has also been made for inundation grasslands, mires and other swamp vegetation associated with saltmarshes, which are only occasionally flooded by tidal saltwater water and support vegetation in which halophytic plants are scarce (conforming to NVC types MG11-13, M28, S19 or S20), using figures from:

- the Scottish saltmarsh survey national report (Haynes 2013), which gives a figure of 424 ha for coastal grassland, including areas of MG11, MG12 and MG13
- the Phase 2 Saltmarsh Survey of Wales (Natural Resources Wales 2022), which recorded *c*. 165 ha of coastal MG11/MG12/MG13 grassland (sometimes growing in mosaic with SM18/23/24/28 or MG6/7) and *c*. 4 ha of M28 mire and S19/20 swamp

2.23.3. Information sources

- Environment Agency (2022) The extent and zonation of saltmarsh in England: 2016-2019 – an update to the national saltmarsh inventory. Environment Agency, Bristol. Available at: https://www.gov.uk/government/publications/the-extent-and-zonation-of-saltmarsh-in-england-2016-2019
- Haynes, T.A. (2016) Scottish saltmarsh survey national report. Scottish Natural Heritage Commissioned Report No. 786. Scottish Natural Heritage, Inverness. Available at: https://www.nature.scot/doc/naturescot-commissioned-report-786-scottish-saltmarsh-survey-national-report
- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).
- Natural Resources Wales (2022) Phase 2 Saltmarsh Survey of Wales. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number AC0000849444. Crown Copyright and Database Right. Available at: https://datamap.gov.wales/layergroups/geonode:nrw_phase_2_salt_marsh

2.24. MT2.1 Coastal shrublands and grasslands

2.24.1. Corresponding UK habitat/vegetation types

In the UK, this ecosystem type is represented by four UK BAP Priority habitat types:

- Coastal sand dunes
- Coastal vegetated shingle
- Machair
- Maritime cliffs and slopes

The main corresponding NVC types for these are MC1-12 on coastal cliffs and shingle; SD1-19 on coastal shingle, sand dunes and machair; A10/11/13/16/19/21/22, M15/16 and S4/19/20 on dune slacks; CG1/2/6/7/10/13 and H1/2/4/7/8/10/11 in coastal locations; MG1/5/9-12 on coastal cliffs and shingle and MG11 on machair; U1/2/4-6/20 on coastal cliffs, sand dunes and shingle; and W1/2/4/6/9-11/21-25 in various coastal locations.

The Habitats Directive Annex I habitat types covered by this ecosystem types are:

- H1210 Annual vegetation of drift lines
- H1220 Perennial vegetation of stony banks
- H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- H2110 Embryonic shifting dunes
- H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
- H2130 Fixed dunes with herbaceous vegetation (grey dunes)
- H2140 Decalcified fixed dunes with *Empetrum nigrum*
- H2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)
- H2160 Dunes with *Hippophae rhamnoides*
- H2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)
- H2190 Humid dune slacks
- H2250 Coastal dunes with *Juniperus* spp.
- H21A0 Machair

The following have not been included under this ecosystem type:

- inundation grasslands, mires and others swamp vegetation associated with saltmarshes, which are included under the MFT1.3 Coastal saltmarshes and reedbeds ecosystem type
- large seabird colonies occurring on maritime/sea cliffs that are accounted for under the MT2.2 Large seabird and pinniped colonies ecosystem type, which cover an area of 1,262 ha

2.24.2. Extent

The extent figure for this ecosystem type is 79,555 ha. This is based on data from: (a) the Priority Habitats Inventory (Natural England, 2024); (b) the State of Natural Resources Report (SoNaRR 2025); and (c) the Habitats Regulations Reporting (2025).

The figure for England is based on the area of the following UK BAP Priority habitat types recorded in the Priority Habitats Inventory:

- Maritime cliff and slopes (13,818 ha)
- Coastal sand dunes (10,641 ha)
- Coastal vegetated shingle (4,036 ha)

The figure for sand dunes in Wales (= 7,919 ha) is the area reported in the State of Natural Resources Report 2025.

The figures for Northern Ireland (1,506 ha), Scotland (39,731 ha), and non-sand dune habitats in Wales (3,166 ha) are based on the following Habitats Directive Annex I habitat types:

- H1210 Annual vegetation of drift lines
- H1220 Perennial vegetation of stony banks
- H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- H2110 Embryonic shifting dunes
- H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
- H2130 Fixed dunes with herbaceous vegetation (grey dunes)
- H2140 Decalcified fixed dunes with *Empetrum nigrum*

- H2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)
- H2160 Dunes with *Hippophae rhamnoides*
- H2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)
- H2190 Humid dune slacks
- H2250 Coastal dunes with *Juniperus* spp.
- H21A0 Machair

To account for the area of land covered by the MT2.2 Large seabird and pinniped colonies ecosystem type, 1,262 ha has been deducted from the total extent figure (including 107 ha in England, 130 ha in Northern Ireland, 917 ha in Scotland, and 108 ha in Wales).

2.24.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026)
- Natural England (2024) Priority Habitats Inventory (England). Natural England Open Data Publication, July 2024 version. Available at: https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::priority-habitats-inventory-england/about
- SoNaRR (2025) Unpublished data supplied to JNCC by Natural Resources Wales to be incorporated into the Third State of Natural Resources Report (SoNaRR) for Wales (due for publication in 2026)

2.25. MT2.2 Large seabird and pinniped colonies

2.25.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by colonies of breeding seabirds that occur in large concentrations along parts of the UK coastline and on small offshore islands, primarily on maritime/sea cliffs. It mainly overlaps with the Maritime cliff and slopes UK BAP Priority habitat type and includes two specific NVC sea-bird cliff plant communities (MC6-7), which are associated with the heavily eutrophicated/disturbed conditions found in such large seabird colonies.

The following have not been included under this ecosystem type:

- UK seabird colonies that fall below the major occurrence threshold of total excreted N < 400 kg/y per km^2 (as used in the Global Ecosystem Typology assessment of the global distribution of this ecosystem type, noting that the ecosystem properties for this type emphasises that it is focused on sites receiving massive nutrient subsidies from large concentrations of roosting or nesting seabirds, which (along with potentially massive physical disturbance to vegetation and soils) distinguish these colonies from otherwise similar ecosystems in the MT2.1 Coastal shrublands and grasslands type
- UK seal colonies as there is insufficient data to assess whether any sites met the major occurrence threshold of total excreted N

2.25.2. Extent

The extent figure for this ecosystem type is 1,262 ha (England = 107 ha, Northern Ireland = 130 ha, Scotland = 917 ha, Wales = 108 ha).

This is based on an analysis of: (a) the 2015-2021 UK seabird census totals for coastal Special Protection Areas (SPAs) that have seabirds listed as a qualifying feature (as reported by Burnell *et al*. 2023); and (b) nitrogen (N) excretion data for each seabird species taking account of the proportion of the total population that are likely to be chicks (as proposed by Otero *et al*. 2018).

The population size of each breeding seabird species was estimated from the seabird census data, with counts relating to pairs being converted to individuals based on species-specific correction factors outlined in Burnell *et al*. (2023). The total breeding population and number of chicks for each species in each SPA was estimated by calculating the proportion of chicks within the total global population (from Supplementary Data 1 provided by Otero *et al*. 2018). From the same data, total N excreted per bird per year for each species (average of both breeding adult and chick) was calculated by dividing the global N excreted by each species by the global population (breeding adults and chicks). From this information, total N excreted per species in each coastal SPA was calculated and summed to gain an estimate of total N excreted at each SPA.

The boundaries of the official SPA shapefiles were clipped to calculate the density of N excreted in that part of the SPAs that breeding seabirds were most likely to be concentrated in. Marine areas were removed by clipping the boundary to the mean-high water mark (MHWM) line. For SPAs associated with coastal cliffs, the boundary was then clipped to within 10 m of the MHWM to leave a narrow strip of coastline that gave an approximate area for the land where breeding seabirds were concentrated. This approach was not considered to be appropriate for SPAs associated with shingle, saltmarshes and/or sand dune habitats, as the location of breeding seabirds (primarily gulls and terns) was not obviously closely linked to the MHWM line – as there was no obvious alternate means of automating the clipping non-cliff sites to calculate the area of land where breeding seabirds were concentrated, such sites were therefore not included in the final analysis. An estimate of the total excreted N per terrestrial km^2 was then calculated for each SPA, with the total amount of excreted N being used for sites that had a clipped area < 1 km^2.

The major and minor occurrence thresholds from Otero *et al*. (2018) (as used for the Global Ecosystem Typology assessment of the global distribution of this ecosystem type; were used to determine major (> 100,000 kg per year N) and minor (> 1,000 and < 100,000 kg per year N) seabird colonies. These were scaled to 1 km^2, meaning that SPAs where total excreted N was > 400 kg per year per km^2 were counted as a major occurrences, and SPAs with total excreted N between > 4 and < 400 kg per year per km^2 were counted as minor occurrences.

This identified 54 coastal cliff SPAs that were above the major occurrence threshold, covering a terrestrial area of approximately 1,262 ha. The total excreted N from these sites is over 2.5 million kg per year (2.5 Gg per year).

2.25.3. Information sources

- Burnell, D., Perkins, A. J., Newton, S.F., Bolton, M., Tierney, T. D., and Dunn, T.E. (2023) Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015-2021). Lynx Nature Books, Barcelona.
- JNCC Seabirds Count – the fourth Breeding Seabird Census. Available at: https://jncc.gov.uk/our-work/seabirds-count/
- JNCC Seabirds Count Datasets (2023) Available at: https://jncc.gov.uk/resources/63f0ea40-485d-46dd-b967-150df90a7b2b#comparative-seabirds-count-dataset-revised-20240708.xlsx

- JNCC Special Protection Areas (SPAs): List of sites. Available at: https://jncc.gov.uk/our-work/list-of-spas/
- Otero, X. L., De La Peña-Lastra, S., Pérez-Alberti, A., Ferreira, T. O., and Huerta-Diaz, M. A. 2018. Seabird colonies as important global drivers in the nitrogen and phosphorus cycles. Nature Communications 9, 246. Available at: https://www.nature.com/articles/s41467-017-02446-8#Tab1

2.26. S1.1 Aerobic caves

2.26.1. Corresponding UK habitat types

This ecosystem type includes subterranean aerobic caves. Although this habitat is present in the UK and some cave systems have been mapped, comprehensive data on its extent is not available; nor does it seem appropriate to include in the extent figures for the indicator as it is problematic to define and assess and will frequently be overlain by other ecosystem types.

2.27. S1.2 Endolithic systems

2.27.1. Corresponding UK habitat types

This ecosystem type is found in matrices and fissures of rocks and hosts abundant microscopic life throughout the Earth's crust. Although this habitat is present in the UK, comprehensive data on its extent is not available; nor does it seem appropriate to include in the extent figures for the indicator as it is problematic to define and assess and will frequently be overlain by other ecosystem types.

2.28. SF1.1 Underground streams and pools

2.28.1. Corresponding UK habitat types

This ecosystem type includes subterranean freshwater streams, pools and aquatic voids (flooded caves). Although this habitat is present in the UK and some underground cave systems have been mapped, comprehensive data on its extent is not available; nor does it seem appropriate to include in the extent figures for the indicator as it is problematic to define and assess and will frequently be overlain by other ecosystem types.

2.29. SF1.2 Groundwater ecosystems

2.29.1. Corresponding UK habitat types

This ecosystem type includes subterranean freshwater groundwater ecosystems that occur within or below the groundwater (phreatic) zones. This includes aquifers (underground layers of water-saturated permeable rock or unconsolidated gravel, sand, or silt) and hyporheic zones beneath rivers and lakes (i.e. where shallow groundwater and surface water mix). Although this habitat is present in the UK, comprehensive data on its extent is not available; nor does it seem appropriate to include in the extent figures for the indicator as it is problematic to define and assess and will frequently be overlain by other ecosystem types.

3. Marine ecosystem types

3.1. Introduction

3.1.1. Overall scope of marine ecosystems

For the marine ecosystem extent figures presented below, the landward limit is based on the mean high water mark (MHWM), and the overall extent is based on the area of the UK Exclusive Economic Zone (EEZ), noting that this does not include the entirety of the UK continental shelf.

3.1.2. Overlapping marine ecosystem types

Some of the marine ecosystem types overlap with each other, i.e. they are not mutually exclusive. These are marked with an asterisk (*) in Table 2 in the Indicator fiche. They are also set out in the table below under various 'physiographic' ecosystem types, i.e. where the ecosystem type is based on physical landforms that form large, distinct regions in which species can establish, such as an estuary. Note that some ecosystem types may occur in more than one physiographic ecosystem type (e.g. M1.1 Seagrass meadows and M3.5 Deepwater biogenic beds), and some physiographic types may occur within another physiographic type (e.g. both M3.2 Submarine canyons and M3.4 Seamounts, ridges and plateaus may occur within M3.1 Continental and island slopes). In addition to this, the marine ecosystem types under the M2 Pelagic ocean waters biome, which forms the open-ocean water column across the marine area, overlap with each other and with all M1 Marine shelf biome and M3 Deep sea floors biome ecosystem types.

These overlaps do not impact the headline figures shown in Table 1 in the Indicator fiche, given that the whole of the UK marine area is covered by at least one marine ecosystem type, i.e. the extent of marine ecosystems given in the table is the total UK marine area.

Table 2: Overlapping ecosystem types organised according to six 'physiographic' ecosystem types.

Physiographic ecosystem type	**Related ecosystem types that completely or partially overlap**
FM1.1 Deepwater coastal inlets	M1.1 Seagrass meadows
	M1.2 Kelp forests
	M1.4 Shellfish beds and reefs
	M1.5 Photo-limited marine animal forests
	M1.6 Subtidal rocky reefs
	M1.7 Subtidal sand beds
	M1.8 Subtidal mud plains
	M1.10 Rhodolith/Maërl beds

Physiographic ecosystem type	Related ecosystem types that completely or partially overlap
FM1.2 Permanently open riverine estuaries and bays	M1.1 Seagrass meadows
	M1.2 Kelp forests
	M1.4 Shellfish beds and reefs
	M1.5 Photo-limited marine animal forests
	M1.6 Subtidal rocky reefs
	M1.7 Subtidal sand beds
	M1.8 Subtidal mud plains
	M1.10 Rhodolith/Maërl beds
	SM1.3 Sea caves
M3.1 Continental and island slopes	M3.2 Submarine canyons
	M3.4 Seamounts, ridges and plateaus
	M3.5 Deepwater biogenic beds
M3.2 Submarine canyons	M3.5 Deepwater biogenic beds
M3.4 Seamounts, ridges and plateaus	M3.5 Deepwater biogenic beds
SM1.3 Sea caves	MT1.1 Rocky shorelines

3.2. M1.1 Seagrass meadows

3.2.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by Seagrass and *Zostera* Beds as listed in:

- the Section 7 list of Habitats of Principal Importance for the purpose of maintaining and enhancing biodiversity in relation to Wales
- the Section 41 list of Habitats of Principal Importance for the conservation of biological diversity in England
- the Scottish Biodiversity List of habitats of highest priority for biodiversity conservation in Scotland
- the Northern Ireland list of Priority habitats
- the OSPAR list of Threatened and/or Declining Habitats

3.2.2. Extent

The extent figure for this ecosystem type is 18,800 ha. This is based on the area of Seagrass Beds recorded by Natural England (2024), Natural Resources Wales (2019) and NatureScot (2025), and the extent of *Zostera* Beds in marine waters in Northern Ireland recorded in OSPAR (2022).

3.2.3. Information sources

- Natural England (2024) National Seagrass Layer (England). 2024-03-13 version, accessed on 2024-06-04. Available at: https://www.data.gov.uk/dataset/aa1787a7-71fb-4c44-bf27-7825f9c5ee64/national-seagrass-layer-england
- Natural Resources Wales (2019) Environment (Wales) Act Section 7 and OSPAR: Marine Habitats. Available at: https://datamap.gov.wales/layergroups/inspire-nrw:MarineBAPOSPARHabitats
- NatureScot (2025) Geodatabase of Marine features adjacent to Scotland (GeMS). Available at: https://opendata.nature.scot/maps/0e722e3e911e424f8dacac5a587c0dfb/about
- OSPAR (2022) OSPAR Habitats in the North-East Atlantic Ocean - 2022 Polygon records. Available at: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/53704f1d-5efd-45e0-bae3-9ec611baea40

3.3. M1.2 Kelp forests

3.3.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the OSPAR Threatened and/or Declining Habitat Kelp Forests.

3.3.2. Extent

The extent figure for this ecosystem type is 10,300 ha. This is based on the area of Kelp Forests in UK marine waters recorded in OSPAR (2022).

3.3.3. Information sources

- OSPAR (2022) OSPAR Habitats in the North-East Atlantic Ocean - 2022 Polygon records. Available at: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/53704f1d-5efd-45e0-bae3-9ec611baea40

3.4. M1.4 Shellfish beds and reefs

3.4.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by a combination of:

- the OSPAR Threatened and/or Declining Habitat *Ostrea edulis* Beds (equivalent to Native Oyster Beds in the Section 41 list of Habitats of Principal Importance in England)
- the OSPAR Threatened and/or Declining Habitat *Modiolus modiolus* Horse Mussel Beds (equivalent to Horse Mussel Beds in the Section 41 list of Habitats of Principal Importance in England, Section 7 list of Habitats of Principal Importance in Wales, and the Scottish Biodiversity List)
- Blue Mussel Beds in the Section 41 list of Habitats of Principal Importance in England, Section 7 list of Habitats of Principal Importance in Wales, the Scottish

Biodiversity List, and the Northern Ireland list of Priority habitats (the OSPAR Threatened and/or Declining Habitat Intertidal *Mytilus edulis* Beds on Mixed and Sandy Sediments is a component of Blue Mussel Beds, but only in the intertidal zone)

- Flame Shell Beds in the Scottish Biodiversity List

3.4.2. Extent

The extent figure for this ecosystem type is 12,100 ha. This is based on the combined area of:

- *Ostrea edulis* and *Modiolus modiolus* beds (Horse Mussel Beds) in UK marine waters recorded in OSPAR (2022)
- Blue Mussel Beds recorded by Natural England (2025) and Natural Resources Wales (2019)
- Flame Shell Beds recorded by NatureScot (2025)
- Intertidal *Mytilus edulis* Beds on Mixed and Sandy Sediments in marine waters in Northern Ireland recorded in OSPAR (2022)

3.4.3. Information sources

- Natural England (2025) Marine Habitats and Species Open Data (England) – Shellfish beds and reefs layer. 2025 version, accessed 2025-08-01. Available at: https://environment.data.gov.uk/dataset/112302df-ba0f-4e81-beab-7a2badb1f148
- Natural Resources Wales (2019) Environment (Wales) Act Section 7 and OSPAR: Marine Habitats. Available at: https://datamap.gov.wales/layergroups/inspire-nrw:MarineBAPOSPARHabitats
- NatureScot (2025) Geodatabase of Marine features adjacent to Scotland (GeMS). Available at: https://opendata.nature.scot/maps/0e722e3e911e424f8dacac5a587c0dfb/about
- OSPAR (2022) OSPAR Habitats in the North-East Atlantic Ocean - 2022 Polygon records. Available at: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/53704f1d-5efd-45e0-bae3-9ec611baea40

3.5. M1.5 Photo-limited marine animal forests

3.5.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by light-limited (often silted) biotopes mainly in the Circalittoral rock and other hard substrata part of the Marine Habitat Classification for Britain and Ireland (Connor *et al*. 2004). The following broadscale habitats contain the specific associated biotopes which fit the Global Ecosystem Typology guidance:

- CR.HCR – High energy circalittoral rock
- CR.LCR – Low energy circalittoral rock
- IR.LIR – Low energy infralittoral rock
- SS.SBR – Sublittoral biogenic reefs on sediment

The following have not been included under this ecosystem type:

- dense macroalgal covered substrate, which is included under M1.2 Kelp forests ecosystem type
- bivalve reefs, which are included under M1.4 Shellfish beds and reefs ecosystem type
- non-photo limited biogenic/rocky reefs, which are included under M1.4 Shellfish beds and reefs and M1.6 Subtidal rocky reef ecosystem types respectively, or (more broadly) the FM1.2 Permanently open riverine estuaries and bays ecosystem type

3.5.2. Extent

The extent figure for this ecosystem type is 362,300 ha. This is based on the area recorded in the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.5.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.6. M1.6 Subtidal rocky reefs

3.6.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by specific associated biotopes from the following broadscale habitats of the Marine Habitat Classification for Britain and Ireland (Connor *et al*. 2004):

- IR.FIR – Features of infralittoral rock
- IR.HIR – High energy infralittoral rock
- IR.LIR – Low energy infralittoral rock
- IR.MIR – Moderate energy infralittoral rock
- CR.FCR – Features of circalittoral rock
- CR.HCR – High energy circalittoral rock
- CR.LCR – Low energy circalittoral rock
- CR.MCR – Moderate energy circalittoral rock

The following have not been included under this ecosystem type:

- macroalgal-dominated rock, which is included under M1.2 Kelp forests ecosystem type
- biogenic reefs, which is included (where applicable) under the M1.5 Photo-limited marine animal forests, M1.4 Shellfish beds and reefs or (more broadly) FM1.2 Permanently open riverine estuaries and bays ecosystem types
- photo-limited faunal communities, which are accounted for under M1.5 Photo-limited marine animal forests ecosystem type

3.6.2. Extent

The extent figure for this ecosystem type is 108,600 ha. This is based on the area record in UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.6.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.7. M1.7 Subtidal sand beds

3.7.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the associated biotopes from the following broadscale habitats of the Marine Habitat Classification for Britain and Ireland (JNCC 2022):

- SS.SCS – Sublittoral coarse sediment (unstable cobbles and pebbles, gravels and coarse sands)
- SS.SMx – Sublittoral mixed sediment
- SS.SSa – Sublittoral sands and muddy sands

3.7.2. Extent

The extent figure for this ecosystem type is 43,073,500 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.7.3. Information sources

- JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.8. M1.8 Subtidal mud plains

3.8.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the associated biotopes from the following broadscale habitat of the Marine Habitat Classification for Britain and Ireland (JNCC 2022):

- SS.SMu – Sublittoral cohesive mud and sandy mud communities

3.8.2. Extent

The extent figure for this ecosystem type is 6,081,100 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.8.3. Information sources

- JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.9. M1.10 Rhodolith/Maërl beds

3.9.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the Marine Habitat Classification Level 4 biotope:

- SS.SMp.Mrl – Maërl beds

3.9.2. Extent

The extent figure for this ecosystem type is 9,100 ha. This is based on the area of Maërl beds in the Habitats Regulations Reporting (2025), including all records relating to S1376

Maërl (*Lithothamnion corallioides*) and S1377 Maërl (*Phymatolithon calcareum*). Due to the difficulties in identifying specific socies of Maërl, this included records where the species of Maërl was uncertain.

3.9.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

3.10. M2.1 Epipelagic ocean waters

3.10.1. Corresponding UK habitat types

This ecosystem type is defined as the uppermost ocean layer (0–200 m depth). Although this ecosystem type is present in the UK, it does not correspond to any UK marine classification types. As it overlaps with other M2 Pelagic ocean waters ecosystem types (which form the open-ocean water column across the marine area), and similarly with the M1 Marine shelf biome and M3 Deep sea floors biome ecosystem types, it has not been included in the extent figures for the indicator.

3.11. M2.2 Mesopelagic ocean water

3.11.1. Corresponding UK habitat types

This ecosystem type is defined as the very low light twilight zone (~200–1,000 m depth). Although this ecosystem type is present in the UK, it does not correspond to any UK marine classification types. As it overlaps with other M2 Pelagic ocean waters ecosystem types (which form the open-ocean water column across the marine area), and similarly with the M1 Marine shelf biome and M3 Deep sea floors biome ecosystem types, it has not been included in the extent figures for the indicator.

3.12. M2.3 Bathypelagic ocean waters

3.12.1. Corresponding UK habitat types

This ecosystem type is defined as the open-ocean ecosystem which receives no sunlight (~1,000–3,000 m depth). Although this ecosystem type is present in the UK, it does not correspond to any UK marine classification types. As it overlaps with other M2 Pelagic ocean waters ecosystem types (which form the open-ocean water column across the marine area), and similarly with the M1 Marine shelf biome and M3 Deep sea floors biome ecosystem types, it has not been included in the extent figures for the indicator.

3.13. M2.4 Abyssopelagic ocean waters

3.13.1. Corresponding UK habitat types

This ecosystem type is defined as the open-ocean ecosystem which receives no sunlight (~3,000–6,000 m depth). Although this ecosystem type is present in the UK, it does not correspond to any UK marine classification types. As it overlaps with other M2 Pelagic ocean

waters ecosystem types (which form the open-ocean water column across the marine area), and similarly with the M1 Marine shelf biome and M3 Deep sea floors biome ecosystem types, it has not been included in the extent figures for the indicator.

3.14. M3.1 Continental and island slopes

3.14.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the following deep sea habitats and associated biotopes from the Marine Habitat Classification (Parry *et al*. 2015):

- M.AtLB – Atlantic lower bathyal
- M.AtMB – Atlantic mid bathyal
- M.AtUB – Atlantic upper bathyal
- M.AAUB – Atlanto-Arctic upper bathyal
- M.ArMB– Arctic mid bathyal
- M.ArLB – Arctic lower bathyal

3.14.2. Extent

The extent figure for this ecosystem type is 18,215,100 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.14.3. Information sources

- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- Parry, M.E.V., K.L. Howell, B.E. Narayanaswamy, B.J. Bett, D.O.B. Jones, D.J. Hughes, N. Piechaud, T.D. Nickell, H. Ellwood, N. Askew, C. Jenkins and E. Manca (2015) A Deep-sea Section for the Marine Habitat Classification of Britain and Ireland. JNCC report 530. ISSN 0963 8901 In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. [Accessed September 2025]. Available at: https://mhc.jncc.gov.uk/resources#version1503
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332.

3.15. M3.2 Submarine canyons

3.15.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by Canyons as defined by Harris (2014).

3.15.2. Extent

The extent figure for this ecosystem type is 383,800 ha. This is based on the area of Canyons recorded in the Seafloor Geomorphic Features Map (Harris 2014).

3.15.3. Information sources

- Harris, P.T., Macmillan-Lawler, M., Rupp, J. and Baker, E.K. (2014) Geomorphology of the oceans. Marine Geology, 352: 4-24. Available at: https://pacific-data.sprep.org/resource/global-seafloor-geomorphic-features

3.16. M3.3 Abyssal Plains

3.16.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by sediment in the abyssal zone, which includes the following deep sea habitats and associated biotopes from the Marine Habitat Classification v22.04 (Parry *et al*. 2015):

- M.ArUA – Arctic upper abyssal
- M.AtLA – Atlantic lower abyssal
- M.AtMA – Atlantic mid abyssal
- M.AtUA – Atlantic upper abyssal

3.16.2. Extent

The extent figure for this ecosystem type is 1,842,300 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.16.3. Information sources

- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332
- Parry, M.E.V., K.L. Howell, B.E. Narayanaswamy, B.J. Bett, D.O.B. Jones, D.J. Hughes, N. Piechaud, T.D. Nickell, H. Ellwood, N. Askew, C. Jenkins and E. Manca (2015) A Deep-sea Section for the Marine Habitat Classification of Britain and Ireland. JNCC Report 530. ISSN 0963 8901 In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. [Accessed September 2025]. Available at: https://mhc.jncc.gov.uk/resources#version1503

3.17. M3.4 Seamounts, ridges and plateaus

3.17.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the OSPAR Threatened and/or Declining Habitat Seamounts, plus Ridges and Plateaus as defined in Harris (2014).

3.17.2. Extent

The extent figure for this ecosystem type is 6,090,300 ha. This is based on Seamounts from OSPAR T&D database v2022 and Ridges and Plateaus from the Seafloor Geomorphic Features Map (Harris 2014).

3.17.3. Information sources

- Harris, P.T., Macmillan-Lawler, M., Rupp, J. and Baker, E.K. (2014) Geomorphology of the oceans. Marine Geology, 352: 4-24. Available at: https://pacific-data.sprep.org/resource/global-seafloor-geomorphic-features
- OSPAR (2022) OSPAR Habitats in the North-East Atlantic Ocean - 2022 Polygon records. Available at: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/53704f1d-5efd-45e0-bae3-9ec611baea40

3.18. M3.5 Deepwater biogenic beds

3.18.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the following OSPAR Threatened and/or Declining Habitats:

- Coral gardens
- *Lophelia pertusa* reef (which has a definition that includes all species of cold water coral reef present in the NE Atlantic)
- Carbonate mounds
- Deep sea sponge aggregations

The following are excluded:

- discrete colonies of sponges or corals

3.18.2. Extent

The extent figure for this ecosystem type is 2,800 ha. This is based on *Lophelia pertusa* reefs, Coral gardens, Carbonate mounds and Deep sea sponge aggregations from OSPAR Threatened and/or Declining Habitats database v2022.

3.18.3. Information sources

- OSPAR (2022) OSPAR Habitats in the North-East Atlantic Ocean - 2022 Polygon records. Available at: https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/53704f1d-5efd-45e0-bae3-9ec611baea40

3.19. MT1.1 Rocky shorelines

3.19.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the associated intertidal biotopes from the following broadscale habitats of the Marine Habitat Classification for Britain and Ireland (Connor *et al.* 2004):

- LR.FLR – Features of littoral rock
- LR.HLR – High energy littoral rock
- LR.LLR – Low energy littoral rock
- LR.MLR – Moderate energy littoral rock

3.19.2. Extent

The extent figure for this ecosystem type is 28,700 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.19.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1. JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.20. MT1.2 Muddy shorelines

3.20.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the associated intertidal biotopes from the following broadscale habitat of the Marine Habitat Classification for Britain and Ireland (Connor *et al.* 2004):

- LS.LMu – Littoral Mud

3.20.2. Extent

The extent figure for this ecosystem type is 83,000 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.20.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1. JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.21. MT1.3 Sandy shorelines

3.21.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the associated intertidal biotopes from the following broadscale habitats of the Marine Habitat Classification for Britain and Ireland (Connor *et al.* 2004):

- LS.LCS – Littoral coarse sediment
- LS.LMx – Littoral mixed sediment
- LS.LSa – Littoral sand

3.21.2. Extent

The extent figure for this ecosystem type is 175,200 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025b) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.21.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4

- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.22. MT1.4 Boulder and cobble shores

3.22.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by specific associated intertidal biotopes from the following broadscale habitats of the Marine Habitat Classification for Britain and Ireland (Connor *et al.* 2004), but is not well-defined and extent is unlikely to be accurate:

- LR.HLR – High energy littoral rock
- LR.LLR – Low energy littoral rock
- LR.MLR – Moderate energy littoral rock

The following have not been included under this ecosystem type:

- pebbles/cobbles/boulders below 64 mm, which are accounted for under the MT1.3 Sandy shorelines ecosystem type

3.22.2. Extent

The extent figure for this ecosystem type is 2,900 ha. This is based on the UK Atlas of Seabed Habitats (UKASH) Combined Map (JNCC 2025a) filtered according to the Marine Habitat Classification corresponding biotopes as listed in the Global Ecosystem Typology correlation table (JNCC 2025b).

3.22.3. Information sources

- Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004) The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available at: https://mhc.jncc.gov.uk/resources#version0405
- JNCC (2025a) UK Atlas of Seabed Habitats: Combined Map v2025.1 JNCC data release. Available at: https://jncc.gov.uk/resources/2048c042-5d68-46c6-8021-31d177b00ac4
- JNCC (2025b) Marine habitat correlation tables. Due for publication in 2026 as an update to the 2018 database version available at: https://jncc.gov.uk/resources/b9dd7f55-976c-45e9-a9f9-ef93da5a3332

3.23. FM1.1 Deepwater coastal inlets

3.23.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by Sea lochs, i.e. glacially-formed inlets (fjords, fjards) of western Scotland and Ireland, including the voes of Shetland, typically elongate and deepened by glacial action with little freshwater influence, often with narrows and sills dividing the loch into a series of basins (Howson *et al.* 1994; Hiscock 1996).

The following have not been included under this ecosystem type:

- biotopes within the intertidal zone (above 0m depth), which are included under the Marine-Terrestrial Shoreline ecosystem types

3.23.2. Extent

The extent figure for this ecosystem type is 213,500 ha. This is based on the area of Sea lochs from the Coastal Physiographic Features layer in the UKSeaMap 2010 (McBreen *et al*. 2010).

3.23.3. Information sources

- Hiscock, K. (1996). Marine Nature Conservation Review: rationale and methods. JNCC, Peterborough. Available at: https://jncc.gov.uk/resources/3c5bc4ca-2f0a-4fc9-a188-2ea755ee7203
- Howson, C.M., Connor, D.W. and Holt, R.H.F. (1994). The Scottish sealochs. An account of surveys undertaken for the Marine Nature Conservation Review. JNCC, Peterborough.
    - McBreen, F., Askew, N., Cameron, A., Connor, D., Ellwood, H. and Carter, A. (2011) UKSeaMap 2010: Predictive mapping of seabed habitats in UK waters. JNCC Report, No. 446. Available at: https://jncc.gov.uk/resources/07a4513b-f04a-41c2-9be2-4135a14d0d15

3.24. FM1.2 Permanently open riverine estuaries and bays

3.24.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the following Habitats Directive Annex I habitat types:

- H1130 Estuaries
- H1160 Annex I Large Shallow Inlets and Bays

The following have not been included under this ecosystem type:

- biotopes within the intertidal zone (above 0 m depth), which are included under the Marine-Terrestrial Shoreline ecosystem types

3.24.2. Extent

The extent figure for this ecosystem type is 1,177,300 ha. This is based on the area of the H1130 Estuaries and H1160 Annex I Large Shallow Inlets and Bays habitat type from the Habitats Regulations Reporting (2025).

3.24.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

3.25. FM1.3 Intermittently closed and open closed lakes and lagoons

3.25.1. Corresponding UK habitat types

In the UK, this ecosystem type is represented by the Habitats Directive Annex I habitat type:

- H1150 Coastal Lagoons

3.25.2. Extent

The extent figure for this ecosystem type is 5,100 ha. This is based on the area of the H1150 Coastal Lagoons habitat type from the Habitats Regulations Reporting (2025).

3.25.3. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).

3.26. SM1.3 Sea caves

In the UK, this ecosystem type is represented by the Habitats Directive Annex I habitat type:

- H8330 Submerged or partially submerged sea caves

3.26.1. Extent

The extent figure for this ecosystem type is 5 ha. This is based on the area of the H8330 Submerged or partially submerged sea caves habitat type from the Habitats Regulations Reporting (2025).

3.26.2. Information sources

- Habitats Regulations Reporting (2025) Unpublished data submitted to JNCC by Natural England, DAERA, NatureScot and Natural Resources Wales (due for publication in 2026).