

Summary of Key Indicators: Annex 2b Semi-Natural Grasslands

Natural England's Natural Capital Indicators Project aims to identify key attributes for measuring change in natural capital in England, at a range of scales. Key indicators have been identified for the quantity, quality and location of ecosystems. We have not identified suitable repeated measures of the value of benefits that could be used as indicators.

Summary of key indicators:

See table below for further detail and related data sets.

1. **Extent of habitat:** hay meadows and other semi-natural grasslands and active flood plain.

2. Quality

- Hydrology & geomorphology: Naturalness of water levels, flooding, aquifer function, amount of surface water run-off and extent of artificial drainage.
- Nutrient/chemical status – soil nutrients, atmospheric deposition.
- Soil/sediment: carbon, peat depth and biota.
- Species composition: plant species diversity, naturalness of biological assemblage (number of trophic levels and community composition in each).
- Vegetation: ratio of vegetation to bare soil, plant growth rate, surface vegetation roughness, vegetation next to water bodies, vegetation structure/structural diversity, pollinator food plants.
- Cultural: nature, landscape, culture and history, accessibility.
- Geodiversity: active geomorphological processes; favourable condition of designated geosites.

3. Location of:

- Habitats intercepting water pollution (in relation to the source, pathway and receptor).
- Proximity to other semi-natural habitats and insect pollinated crops

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- Flood mitigating land in relation to infrastructure & settlements.
- % population who can access a minimum of 2ha accessible green space / blue space within 2 miles of home.

4. Ecosystem service flows (specific to individual services):

- Measurement of the service: hay and other products, number of reared animals, amount of clean water, carbon sequestered and greenhouse gases fixed, maintenance of wildlife habitats and species, pollinator abundance, regulation of flooding, water quality. Practices that relate to experiential and physical, scientific and educational use.

The project also identifies and reviews datasets for measuring the attributes. Data sets are only included if they are regularly updated. Gaps in data are also identified, where appropriate data sets have not been found.

This note summarises the results of this project for the Broad Habitat of Semi-natural Grasslands, for the key ecosystem services in the table below. Please also see the separate note on the method followed.

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Semi-natural grasslands: provisioning and regulating services			Ecosystem services							Data sources	
Asset attribute	Indicator category	Indicator	Materials from plants, animals & algae	Water supply *	Reared animals & outputs	Water quality *	Flood protection *	Pollination & seed dispersal	Maintenance of nursery pops & habs	Climate regulation	
Quantity	Extent	Hay meadows	X	X				X	X	X	Priority Habitat Inventory
	Extent	Other semi-natural grasslands			X			X	X	X	Priority Habitat Inventory
Quantity	Extent	Active flood plain					X				WFD
Quality	Hydrology & geomorphology	Extent of artificial drainage		X	X	X					None identified
Quality	Hydrology & geomorphology	Naturalness of flooding regime					X				Flood Map for Planning (Rivers and Sea)
Quality	Hydrology & geomorphology	Naturalness of water level regime		X	X						None identified
Quality	Nutrient (& chemical) status	Atmospheric deposition exceedance of critical loads							X		APIS; Heavy Metals Monitoring Network; ICP Vegetation;
Quality	Nutrient (& chemical) status	Soil nutrient status			X				X		Countryside Survey; LANDIS; Representative Soil Sampling Scheme (Rothamstead/ADAS); Agricultural Land Classification
Quality	Soil/sediment processes	Peat depth		X							None identified
Quality	Soil/sediment processes	Soil biota						X	X		Countryside Survey
Quality	Soil/sediment processes	Soil carbon/organic matter content			X			X	X		Countryside Survey; LANDIS; Geochemical Baseline Survey of the Environment;
Quality	Species Composition	Naturalness of biological assemblage number of trophic levels & community composition in each level							X		None identified
Quality	Species Composition	Plant species diversity						X	X		Countryside Survey; CSM (only for Sites of Special Scientific Interest)
Quality	Vegetation	Plant growth rate (and balance with decomposition)	X	X							None identified
Quality	Vegetation	Presence & frequency of pollinator larval & adult food plants						X			Countryside Survey
Quality	Vegetation	Surface/vegetation roughness			X	X					None identified
Quality	Vegetation	Vegetation structure/structural diversity including bare ground						X	X		CSM (only for Sites of Special Scientific Interest)
Quality	Vegetation	Vegetation cover/bare soil			X	X					CSM (only for Sites of Special Scientific Interest)
Quality	Vegetation	Vegetation next to water bodies			X	X					None identified
Spatial config.		Proximity to other semi-natural grasslands & habitats						X	X		None identified
Spatial config.		Proximity of insect pollinator crops from semi-natural grassland.						X			None identified
Spatial config.		Distribution of habitats, in relation to water quality source-pathway-receptor			X						None identified
Spatial config.		Distribution of flood mitigating land in relation to infrastructure & settlements					X				None identified
ES flow		Abundance & distribution of pollinators and seed dispersers						X			Countryside Survey
ES flow		Carbon sequestered & green house gases fixed, by soil/vegetation							X		None identified
ES flow		Maintenance of sustainable ecosystems/life cycle stages							X		None identified
ES flow		Number and type of reared animals			X						Agricultural Land Classification: June Agricultural Survey
ES flow		Availability of water for abstraction		X							UK Government: Water Abstraction Tables; Environment Agency: Groundwater Management Units water resource availability; CEH Hydrological Summary;
ES flow		Water quality (chemical & biological, including viral & bacterial)			X						Countryside Survey; WFD
ES flow		Regulation of flow regime for peak events					X				CEH Hydrological Summary; Environment Agency: Risk of Flooding from Rivers and Sea; CEH National River Flow Archive
ES flow		Production of hay and other materials/products	X								Agricultural Land Classification: June Agricultural Survey

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Semi-Natural Grassland: Cultural & Geodiversity Services						Data Source
Asset attribute	Indicator category	Indicator	Cultural Services	Geodiversity services		
Quantity	Extent	Hay Meadows	X			Priority Habitat Inventory
Quantity	Extent	Other semi-natural grasslands	X			Priority Habitat Inventory
Quantity	Nature	Visibility of wildlife (birds, flowers, butterflies)	X			None identified
Quality	Nature	Presence of flagship species	X			None identified
Quality	Nature	Presence of rare (red list) species	X			None identified
Quality	Nature	Species diversity	X			Countryside Survey; CSM (only for Sites of Special Scientific Interest)
Quality	Nature	Favourable condition of SSSIs	X			CSM (only for Sites of Special Scientific Interest)
Quality	Nature	Favourable condition of designated geosites	X	X		CSM (only for Sites of Special Scientific Interest)
Quality	Landscape, seascape & urban green space	Size of environmental space (ha)	X			None identified
Quality	Landscape, seascape & urban green space	Boundary features – type, length & condition	X			Countryside Survey; OS Master Map
Quality	Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area, registered battlefields)	X			Historic Environment Record
Quality	Quietness	Tranquility	X			CPRE Tranquility mapping (needs updating)
Quality	Accessibility	Mean number of perimeter access points per km	X			None identified
Quality	Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)	X			OS master Map
Quality	Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)	X			None identified
Quality	Formative geological processes	Active geomorphological processes; terrestrial, coastal & marine		X		None identified
Spatial Configuration		% population who can access 2ha of green space within 2 miles of home	X			None identified
ES flow	Experiential & physical use	Number of visits	X			MENE: Monitor of Engagement with the Natural Environment
ES flow	Experiential & physical use	Duration of visits	X			MENE: Monitor of Engagement with the Natural Environment
ES flow	Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)	X			MENE: Monitor of Engagement with the Natural Environment
ES flow	Scientific/educational	Number of research projects; PhD / Masters projects	X			None identified
ES flow	Scientific/educational	Number of school visits	X			None identified