Summary of Key Indicators: Annex 2e Woodland

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 for value of benefits, which could be used as indicators.

Summary of key indicators:

See table below for further detail and related data sets

1. **Extent of habitat:** broadleaved, mixed and yew, coniferous, Priority Habitats, individual and veteran trees.

2. **Quality**
   - Hydrology & geomorphology: naturalness of water levels, flooding and aquifer function plus extent of artificial drainage.
   - Soil/sediment: carbon, biota, mycorrhizal associations.
   - Species composition: naturalness of biological assemblage (number of trophic levels and community composition in each).
   - Vegetation: ratio of vegetation to bare soil, plant growth rate, tree health, vegetation structure/structural diversity, age diversity & regeneration, deadwood, vegetation next to water bodies and leaf surface area & duration across the year.
   - Cultural: nature, landscape, culture and history, accessibility.
   - Geodiversity: active geomorphological processes; condition of designated geosites.

3. **Location of:**
   - Habitats intercepting water pollution (in relation to the source, pathway and receptor).
   - Flood mitigating land in relation to infrastructure & settlements.
   - Patch size shape and edge.
   - Distribution of woodland in relation to settlements and sources of air pollution.
   - % 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: amount of clean water, production of timber, paper & other wood products, wood based fuel harvested, carbon sequestered and greenhouse gases fixed, maintenance of wildlife habitats and species, regulation of flooding, water quality, air quality. Practices that relate to experiential and physical, scientific and educational; aesthetic, spiritual and/or emblematic use.

NATURAL ENGLAND

Summary of Key Indicators: Annex 2e Woodland

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 Woodlands, for the key ecosystem services in the table below. Please also see the separate note on the method followed.

Summary of Key Indicators: Annex 2e Woodland

Woodlands: provisioning and regulating services

Ecosystem services * These ecosystem services are also considered at a whole freshwater catchment scale

Asset attribute	Indicator category	Indicator	Provisioning materials	Plant-based energy	Water supply *	Water quality *	Air quality	Flood protection *	Maintenance of nursery pops & habs	Climate regulation	Data sources
Quantity	Extent	Broadleaved, mixed & yew woodland	X	X	X	X	X	X	X	X	Priority Habitat Inventory, National Forest Inventory
Quantity	Extent	Coniferous woodland	X	X	X	X	X	X		X	National Forest Inventory
Quantity	Extent	Individual trees/ veteran trees							X		National Tree Map, Ancient Woodland Inventory
Quantity	Extent	Woodland Priority Habitats							X		Priority Habitat Inventory
Quality	Hydrology & geomorphology	Extent of articifial drainage			X	X		X			None identifed
Quality	Hydrology & geomorphology	Natural aquifer function recharge & discharge			X						Environment Agency: Groundwater Management Units; WFD
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 identifed
Quality	Soil/sediment processes	Soil biota							X		Countryside Survey; LTMN (mainly only on NNRs)
Quality	Soil/sediment processes	Soil carbon/organic matter content					X			X	Countryside Survey; LANDIS; Geochemical Baseline Survey of the Environment; LTMN (mainly only on NNRs)
Quality	Soil/sediment processes	Soil mycorrhizal associations							X		LTMN (mainly only on NNRs)
Quality	Species Composition	Naturalness of biological assemblage number of trophic levels & community composition in each level							X		None identifed
Quality	Vegetation	Age structure (including veteran trees) and regeneration							X		CSM (only for Sites of Special Scientific Interest)
Quality	Vegetation	Deadwood – including standing							X		CSM (only for Sites of Special Scientific Interest)
Quality	Vegetation	Leaf surface area and duration across the year					X				None identified
Quality	Vegetation	Plant growth rate	X	X						X	None identifed
Quality	Vegetation	Tree health	X	X							None identified
Quality	Vegetation	Vegetation cover/bare soil				X		X			None identified
Quality	Vegetation	Vegetation next to water bodies				X		X			None identifed
Quality	Vegetation	Vegetation structure/structural diversity							X		CSM (only for Sites of Special Scientific Interest)
Spatial config.		Distribution of habitats, in relation to water quality source-pathway-receptor				X					None identifed
Spatial config.		Distribution of flood mitigating land in relation to infrastructure & settlements						X			None identifed
Spatial config.		Distribution of woodland in relation to settlements					X				None identifed
Spatial config.		Patch size, shape and edge							X		None identifed
ES flow		Availability of water for abstraction			X						UK Governement: Water Abstraction Tables; Environment Agency: Groundwater Management Units water resource availability; CEH Hydrological Summary;
ES flow		Production of timber, paper & other wood products	X								Forestry Commission Forestry Statistics
ES flow		Wood-based fuel harvested	X								None identified
ES flow		Water quality (chemical & biological, including viral & bacterial)				X					Water Framework Directive
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		Carbon sequestered & green house gases fixed, by soil/vegetation								X	Forestry Commission Forestry Statistics; JNCC: Removal of greenhouse gases by forestry
ES flow		Maintenance of sustainable ecosystems/life cycle stages							X		None identifed
ES flow		Air pollutants removed by vegetation					X				Defra Environmental Statistics; Defra air quality data catalogue

Summary of Key Indicators: Annex 2e Woodland

Woodlands: Cultural & Geodiversity Services			Cultural Services	Geodiversity services	Data Source
Asset attribute	**Indicator category**	**Indicator**			
Quantity	Extent	Broadleaved, mixed & yew woodland	X		Priority Habitat Inventory, National Forest Inventory
Quantity	Extent	Coniferous woodland	X		National Forest Inventory
Quantity	Extent	Individual trees/ veteran trees	X		National Tree Map
Quantity	Extent	Woodland Priority Habitats	X		Priority Habitat Inventory
Quality	Nature	Visibility of wildlife	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	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	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, Public Rights of Way
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