Natural England Evidence Information Note EIN049

Natural Capital Indicators: Annex 3 Short and long list indicators for key ecosystem services

This Evidence Information Note summarises the Natural Capital Indicators, identified by Natural England's Natural Capital Indicator Project (NERR076). Short and long list indicators have been organised by broad habitat. A separate freshwaters table shows the indicators for the ecosystem services provided by all the habitats within a catchment. Potential data sources to measure the indicators, as well as data gaps, are detailed in the Natural Capital Indicators Excel Spreadsheet (Annex 4).

Key

X	Shortlist priority attribute for measuring change in natural capital
	Long list priority attribute for measuring change in natural capital (provisioning and
х	regulating services only)
Υ	Ecosystem service for whole catchment - covered by Freshwaters tables
Shaded	Ecosystem service where indicators identified for this broad habitat, either individually
columns	or for catchment under Freshwaters tables



Natural Capital Indicators: Annex 3 Short and Long List Indicators

Abbreviated ecosystem service name	Full ecosystem service description following CICES
Materials from plants, animals & algae	Provisioning materials from plants animals and algae for agricultural/direct use or processing (terrestrial)
Wild animals, plants, algae, & outputs	Wild animals, plants and algae and their outputs (marine)
Aquaculture	Animals, plants and algae from in-situ aquaculture
Cultivated crops	Cultivated crops
Water supply	Water for drinking & non-drinking purposes
Reared animals & outputs Water quality	Reared animals & their outputs Maintenance of water quality - Mediation of wastes, toxins & other nuisances (by biota & ecosystems)/chemical condition of freshwaters/chemical condition of freshwaters
Air quality	Maintenance of air quality - Mediation of wastes, toxins & other nuisances (by biota & ecosystems) Noise regulation - Mediation of wastes, toxins & other nuisances (by biota &
Noise regulation Mass stabilisation	ecosystems) Mass stabilisation and control of erosion rates
Flood protection Pollination & seed dispersal	Flood protection Pollination and seed dispersal
Maintenance of nursery pops & habs	Maintenance of nursery populations and habitats (and other stages of life cycles)
Pest & disease control	Pest and disease control
Climate regulation Cultural services	Global, regional & local climate regulation Practices related to: experiential (e.g. wildlife watching) & physical use (e.g. walking); Scientific / educational (subject matter of research, education, insitu and ex-situ); Aesthetic (e.g. art, poetry, writing); spiritual and/or emblematic (e.g. emblematic plants and animals, sacred).

Natural Capital Indicators: Annex 3 Short and Long List Indicators

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Coastal margins (Quality and Quantity)

Ecosystem Services

Coastal margins (Quality and Quantity) Ecosystem Services								
Asset attribute	Indicator category	Indicator	Mass stabilisation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services	
Quantity	Extent	Coastal lagoons			х		Х	
Quantity	Extent	Intertidal sediment (beach and mud)	х	Х	Х	Х	Х	
Quantity	Extent	Salt marsh	Х	X	Х	Х	Х	
Quantity	Extent	Sand dunes	Х	X	X	Х	Х	
Quantity	Extent	Sea cliff			X		Х	
Quantity	Extent	Shingle	X	X	X		X	
Quality	Nutrient (& chemical) status	Nutrient & chemical status of coastal lagoons			х			
Quality	Nutrient (& chemical) status	Sediment/soil nutrient status			Х			
Quality	Soil/sediment processes	Sediment stabilisation		X				
Quality	Soil/sediment processes	Sediment supply/availability (including type, grain size)	х	x	х			
Quality	Soil/sediment processes	Soil/sediment biota			X	X		
Quality	Soil/sediment processes	Soil carbon/organic matter content				x		
Quality	Species composition	Invasive non-native species			X			
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level			х			
Quality	Vegetation	Cover of vegetation/bare soil (esp. dunes, shingle, dynamic between saltmarsh/mudflat)	х	x				
Quality	Vegetation	Natural strandline – triggers formation of new dunes & saltmarsh		х	х			
Quality	Cultural: Nature	Visibility of wildlife (birds, plants)					Х	
Quality	Cultural: Nature	Presence of flagship species					Х	
Quality	Cultural: Nature	Presence of rare (red list) species					Х	
Quality	Cultural: Nature	Species diversity					Х	

Quality	Cultural: Nature	Favourable condition of SSSIs			X
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)			x
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)			x
Quality	Cultural: Quietness	Tranquillity			Х
Quality	Cultural: Accessibility	Mean number of perimeter access points per km			x
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)			x
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)			х

Coastal margins (Spatial Configuration and Ecosystem Service Flow)

Ecosystem Services

Asset attribute	Indicator category	Indicator	Mass stabilisation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Transition and connectivity from subtidal to terrestrial habitats			Х		
Spatial config.		Width/area/location for dynamic movement and development of coastal habitats e.g. saltmarsh and sand dunes	х		х		
Spatial config.		Width/area/location of habitats providing flood protection – for housing and infrastructure		x			
Spatial config.		% population who can access 2ha of green space within 2 miles of home					X
ES flow		Carbon sequestered & green house gases fixed				х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages			х		
ES flow		Reduced inundation of terrestrial areas from marine flooding		X			
ES flow		Sediment stabilisation	Х				
ES flow	Cultural: Experiential & physical use	Number of visits					X
ES flow	Cultural: Experiential & physical use	Duration of visits					x
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)					x
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects					x
ES flow	Cultural: Scientific/educational	Number of school visits					x

Enclosed Farmland (Quantity and Quality)

Ecosystem Services

Asset attribute	Indicator category	Indicator	Cultivated crops	Water supply	Reared animals & outputs	Water quality	Mass stabilisation	Flood protection	Pollination & seed dispersal	Maintenance of nursery pops & habs	Pest & disease control	Climate regulation	Cultural services
Quantity	Extent	Arable & rotational leys	Х										Х
Quantity	Extent	Bio-energy crops										х	
Quantity	Extent	Horticulture	Х										
Quantity	Extent	Improved grassland			Х		х					х	Х
Quantity	Extent	Orchards & top fruit	Х				х					х	Х
Quantity	Extent	Permanent pasture					Х					х	Х
Quality	Hydrology & geomorphology	Ponds – number/density								Х			
Quality	Nutrient (& chemical) status	Soil chemical status							Х				
Quality	Nutrient (& chemical) status	Soil nutrient status	Х		Х					х		Х	
Quality	Soil/sediment processes	Degree of compaction	х		х		х		х				
Quality	Soil/sediment processes	Soil biota	х		х					Х	х	Х	
Quality	Soil/sediment processes	Soil carbon/organic matter content	х				Х			х		Х	
Quality	Soil/sediment processes	Soil moisture	Х		х							х	
Quality	Soil/sediment processes	Soil Type	Х		х								
Quality	Soil/sediment processes	Soil pH	х										
Quality	Soil/sediment processes	Soil saline status	х										
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level								х			

Quality	Vegetation	Extent & condition of linear vegetation features and pockets of semi natural vegetation			ĸ	х	x	х		
Quality	Vegetation	Extent of permanent vegetation cover			K				Х	
Quality	Vegetation	Plant growth rate - biomass	Х	Х						
Quality	Vegetation	Above and below ground biomass			ĸ				х	
Quality	Vegetation	Presence & frequency of pollinator larval & adult food plants				х				
Quality	Vegetation	Small farm woodlands/scrub					х		х	
Quality	Cultural: Nature	Visibility of wildlife (birds, mammals, flowers)								х
Quality	Cultural: Nature	Presence of flagship species								Х
Quality	Cultural: Nature	Presence of rare (red list) species								Х
Quality	Cultural: Nature	Species diversity								Х
Quality	Cultural: Nature	Favourable condition of SSSIs								Х
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)								х
Quality	Cultural: Landscape	Boundary features – type, length & condition								Х
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)								х
Quality	Cultural: Quietness	Tranquility								х
Quality	Cultural: Accessibility	Mean number of perimeter access points per km								х
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)								х
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)								X

Enclosed farmland (Spatial Configuration and Ecosystem Service Flow)

Ecosystem services

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Asset attribute	Indicator category	Indicator	Cultivated crops	Water supply	Reared animals & outputs	Water quality	Mass stabilisation	Flood protection	Pollination & seed dispersal	Maintenance of nursery pops & habs	Pest & disease control	Climate regulation	Cultural services
Spatial config.		Distribution of habitats, other vegetation and boundary features mitigating soil erosion and landslip risk.					x						
Spatial config.		Proximity of boundary features and semi-natural habitat patches to insect pollinator crops.							х				
Spatial config.		Proximity to semi-natural habitats								х	х		
Spatial config.		% population who can access 2ha of green space within 2 miles of home											х
ES flow		Abundance, species diversity & distribution of pollinators and seed dispersers							х				
ES flow		Abundance and species richness of pest controlling species e.g. predatory carabid beetles									х		
ES flow		Carbon sequestered & green house gases fixed, by soil/vegetation										х	

ES flow		Intact fungal network to reduce infection of plants								х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages							х		
ES flow		Number and type of reared animals			х						
ES flow		Production of crops	х								
ES flow		Reared animal health and productivity			х						
ES flow		Stabilisation of soils					х				
ES flow	Cultural: Experiential & physical use	Number of visits									х
ES flow	Cultural: Experiential & physical use	Duration of visits									х
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)									x
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects									X
ES flow	Cultural: Scientific/educational	Number of school visits									x
See Freshwa	aters tables for catchment serv	rices:		Υ		Υ		Υ			

Freshwaters, open waters, wetlands & floodplains (Quantity and Quality)

Ecosystem services

1 1 CSIIWate	ers, open waters, wetlands & il	Ecosystem services								
Asset attribute	Indicator category	Indicator	Water supply	Water quality	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services		
Quantity	Extent	Active flood plain			Х					
Quantity	Extent	Blanket bog	Х	Х	Х			Х		
Quantity	Extent	Coastal & floodplain grazing marsh			X	Х	Х	X		
Quantity	Extent	Enclosed farmland			х			Х		
Quantity	Extent	Lakes & standing waters	Х			Х		Х		
Quantity	Extent	Lowland Fens				Х	Х	Х		
Quantity	Extent	Lowland raised bog				X	Х	Х		
Quantity	Extent	Modified waters eg reservoirs and canals	X			х		Х		
Quantity	Extent	Other semi-natural habitats	X	Х	Х					
Quantity	Extent	Ponds				Х		Х		
Quantity	Extent	Reedbeds				Х	Х	Х		
Quantity	Extent	Rivers	X			Х		Х		
Quantity	Extent	Woodland	X	X	X			Х		
Quality	Hydrology & geomorphology	Extent of articifial drainage	Х	Х	Х	Х	Х			
Quality	Hydrology & geomorphology	Lack of physical modifications of water bodies			×	x	x			
Quality	Hydrology & geomorphology	Natural aquifer function: recharge & discharge	х		x					
Quality	Hydrology & geomorphology	Naturalness of flooding regime			Х	х	Х			
Quality	Hydrology & geomorphology	Naturalness of flow regime	X		Х	Х				
Quality	Hydrology & geomorphology	Naturalness of lake hydrological regime		х	Х	Х				
Quality	Hydrology & geomorphology	Naturalness of water level regime	Х	Х	х	Х	Х			
Quality	Hydrology & geomorphology	River continuity - lack of obstructions				X				

Quality	Hydrology & geomorphology	Sedimentological regime: erosion & deposition		Х	х	х		
Quality	Nutrient (& chemical) status	Acidification				х		
Quality	Nutrient (& chemical) status	Chemical status of water bodies, not nutrients		х		х		
Quality	Nutrient (& chemical) status	Nutrient status of water bodies		Х		Х		
Quality	Nutrient (& chemical) status	Soil nutrient status		Х		х	Х	
Quality	Soil/sediment processes	Degree of compaction			Х			
Quality	Soil/sediment processes	Peat depth		Х			Х	
Quality	Soil/sediment processes	Soil carbon/organic matter content		Х		Х	Х	
Quality	Soil/sediment processes	Soil moisture			Х		Х	
Quality	Species composition	Invasive non-native species				Х		
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level		x		х		
Quality	Vegetation	Evapotranspiration rate	х					
Quality	Vegetation	Proportion of peat mass actively forming peat	х	X		х	х	
Quality	Vegetation	Above & below ground biomass		х	Х		Х	
Quality	Vegetation	Surface/vegetation roughness		Х	Х			
Quality	Vegetation	Vegetation cover/bare soil		Х	Х		Х	
Quality	Vegetation	Vegetation litter, including debris dams			Х	х		
Quality	Vegetation	Vegetation next to water bodies		Х	Х	Х		
Quality	Cultural: Nature	Visibility of wildlife (fish, birds, mammals)						Х
Quality	Cultural: Nature	Presence of flagship species						Х
Quality	Cultural: Nature	Presence of rare (red list) species						Х
Quality	Cultural: Nature	Species diversity						Х
Quality	Cultural: Nature	Naturalness of watercourses						Х
Quality	Cultural: Nature	Favourable condition of SSSIs						Х
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)						х

Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)		x
Quality	Cultural: Quietness	Tranquillity		X
Quality	Cultural: Accessibility	Mean number of perimeter access points per km		x
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)		x
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)		x

Freshwaters, open waters, wetlands & floodplains (Spatial Configuration and Ecosystem Service Flow)

Ecosystem services

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Asset attribute	Indicator category	Indicator	Water supply	Water quality	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Distribution of flood mitigating land in relation to infrastructure & settlements			х			
Spatial config.		Distribution of habitats, in relation to water quality source-pathway-receptor		х				
Spatial config.		Naturalness of Spatial config. of habitats				х		
Spatial config.		Transition and connectivity of aquatic, terrestrial and marine habitats				х		
Spatial config.		% population who can access 2ha of green space within 2 miles of home						х
ES flow		Availability of water for abstraction	Х					
ES flow		Carbon sequestered & green house gases fixed, by soil/vegetation					х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages				х		
ES flow		Regulation of flow regime for peak events			Х			
ES flow		Water quality (chemical & biological, including pH, viral & bacterial)		х				
ES flow	Cultural: Experiential & physical use	Number of visits						х
ES flow	Cultural: Experiential & physical use	Duration of visits						х

ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)					х
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects					х
ES flow	Cultural: Scientific/educational	Number of school visits					х
Services for wh	Services for whole catchments, not just freshwaters:		Υ	Υ	Y		

Semi-nat	tural grasslands (Quantity	and Quality)				Ecos	ystem s	ervices			
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	Cultural services
Quantity	Extent	Hay meadows	Х		Х			Х	Х	Х	Х
Quantity	Extent	Other semi-natural grasslands			X			Х	Х	Х	Х
Quality	Hydrology & geomorphology	Naturalness of flooding regime							х	х	
Quality	Hydrology & geomorphology	Naturalness of water level regime							х	х	
Quality	Nutrient (& chemical) status	Atmospheric deposition: exceedance of critical loads	х						х		
Quality	Nutrient (& chemical) status	Soil nutrient status							Х	х	
Quality	Soil/sediment processes	Degree of compaction						х	Х		
Quality	Soil/sediment processes	Soil biota			Х				Х	Х	
Quality	Soil/sediment processes	Soil carbon/organic matter content							Х	Х	
Quality	Soil/sediment processes	Soil moisture	х		х						
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level							х		
Quality	Species composition	Plant species diversity						Х	Х		
Quality	Vegetation	Plant growth rate (and balance with decomposition)	х		х						
Quality	Vegetation	Above & below ground biomass								Х	
Quality	Vegetation	Presence & frequency of pollinator larval & adult food plants						x			
Quality	Vegetation	Surface/vegetation roughness							х		
Quality	Vegetation	Vegetation structure/structural diversity including bare ground						х	x		
Quality	Vegetation	Vegetation cover/bare soil						Х	Х		
Quality	Vegetation	Vegetation litter amount and structure							х		
Quality	Cultural: Nature	Visibility of wildlife (birds, flowers, butterflies)									х
Quality	Cultural: Nature	Presence of flagship species									Х
Quality	Cultural: Nature	Presence of rare (red list) species									Х

Quality	Cultural: Nature	Species diversity					Х
Quality	Cultural: Nature	Favourable condition of SSSIs					X
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)					х
Quality	Cultural: Landscape, seascape & urban green space	Boundary features – type, length & condition					х
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)					х
Quality	Cultural: Quietness	Tranquillity					Х
Quality	Cultural: Accessibility	Mean number of perimeter access points per km					х
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)					x
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)					х

Semi-natural grasslands (Spatial Configuration and Ecosystem Service Flow) Ecosystem services

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Asset attribute	Indicator category	Indicator	Materials from plants, animals & algae	Water supply	Reared animals & outputs	Water quality	Flood protection	Pollination & seed	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Proximity of insect pollinator crops from semi- natural grassland.						х			
Spatial config.		Proximity to other semi-natural grasslands & habitats						х	х		
Spatial config.		% population who can access 2ha of green space within 2 miles of home									х
ES flow		Abundance, species diversity & distribution of pollinators and seed dispersers						х			
ES flow		Carbon sequestered & greenhouse gases fixed, by soil/vegetation								х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages							х		
ES flow		Number and type of reared animals			Х						
ES flow		Production of hay and other materials/products	х								
ES flow	Cultural: Experiential & physical use	Number of visits									х
ES flow	Cultural: Experiential & physical use	Duration of visits									х
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)									х
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects									х
ES flow	Cultural: Scientific/educational	Number of school visits									Х
See Fresh	Freshwaters tables for catchment services:			Υ		Υ	Υ				

Marine (Quantity and Quality)

Ecosystem Services

initity and Quality)		ECOSYSTEIN SELVICES						
Indicator category	Indicator	Wild animals, plants, algae & outputs	Aquaculture	Water quality	Maintenance of nursery pops & habs	Climate regulation	Cultural services	
Extent	Blue mussel beds		Х					
Extent	Intertidal rock	Х			Х			
Extent	Maerl beds	Х			Х			
Extent	Reefs	Х		Х	Х	Х	Х	
Extent	Sea grass beds	Х	х	Х	Х	Х	Х	
Extent	Shallow subtidal sediment	х			Х	Х		
Extent	Shelf subtidal sediment	Х			Х	Х		
Extent	Subtidal rock	х			Х			
Hydrology:	Salinity - changes	х			Х			
Hydrology:	Temperature - changes	х			Х	х		
Nutrient (& chemical) status	Bacteriological & viral water quality	X	Х	Х	Х			
Nutrient (& chemical) status	Carbon content of sediment					Х		
Nutrient (& chemical) status	Chemical status of sediment & sea water: toxic contaminants	х	х	х	х			
Nutrient (& chemical) status	Dissolved oxygen	X	Х		Х			
Nutrient (& chemical) status	Nutrient status of sediment & sea water (N, P, Si & water turbidity)	х	х	х	х			
Nutrient (& chemical) status	pH of sea water	Х	х		Х	х		
Soil/sediment processes	Erosion-deposition cycles			Х				
Soil/sediment processes	Sediment biota	Х			Х			
Soil/sediment processes	Sediment properties including stability			Х				
	Indicator category Extent Extent Extent Extent Extent Extent Extent Extent Extent Hydrology: Hydrology: Nutrient (& chemical) status Soil/sediment processes Soil/sediment processes	Indicator category Extent Blue mussel beds Extent Intertidal rock Extent Maerl beds Extent Reefs Extent Sea grass beds Extent Shallow subtidal sediment Extent Shelf subtidal sediment Extent Subtidal rock Extent Shallow subtidal sediment Extent Shelf subtidal sediment Extent Subtidal rock Hydrology: Salinity - changes Hydrology: Temperature - changes Nutrient (& chemical) status Bacteriological & viral water quality Nutrient (& chemical) status Carbon content of sediment Nutrient (& chemical) status Chemical status of sediment & sea water: toxic contaminants Nutrient (& chemical) status Pissolved oxygen Nutrient (& chemical) status Nutrient (& chemical) status Nutrient (& chemical) status Pissolved oxygen Nutrient (& chemical) status Nutrient (& chemical) status Pissolved oxygen Nutrient (& chemical) status Nutrient (& chemical) status Nutrient (& chemical) status Pissolved oxygen Nutrient (& chemical) status Soil/sediment processes Erosion-deposition cycles Soil/sediment processes	Indicator category Indicator Extent Blue mussel beds Extent Intertidal rock Extent Reefs X Extent Sea grass beds X Extent Shallow subtidal sediment X Extent Subtidal rock X Hydrology: Temperature - changes X Nutrient (& chemical) status Bacteriological & viral water quality X Nutrient (& chemical) status Carbon content of sediment Nutrient (& chemical) status Chemical status of sediment & sea water: toxic contaminants Nutrient (& chemical) status Dissolved oxygen X Nutrient (& chemical) status Nutrient (& chemical) status Nutrient (& chemical) status Pissolved oxygen X Nutrient (& chemical) status Nutrient (& chemical) status Nutrient (& chemical) status Pissolved oxygen X Nutrient (& chemical) status Nutrient (& chemical) status Soil/sediment processes Erosion-deposition cycles Soil/sediment processes Sediment biota	Indicator category Indicator Extent Blue mussel beds Extent Intertidal rock Extent Maerl beds Extent Sea grass beds Extent Sea grass beds Extent Shallow subtidal sediment X Extent Shelf subtidal sediment X Extent Subtidal rock X X X X X X X X X X X X X	Indicator category Extent Blue mussel beds Extent Intertidal rock Extent Extent Maerl beds Extent Sea grass beds Extent Sea grass beds Extent Shallow subtidal sediment Extent Shelf subtidal sediment X Extent Carbon content of sediment Nutrient (& chemical) status Bacteriological & viral water quality X X X X X X X X X X X X X	Indicator category Indicator Extent Blue mussel beds Extent Intertidal rock Extent Maerl beds X X X Extent Sea grass beds X X X Extent Shallow subtidal sediment X Extent Shelf subtidal sediment X Extent Shelf subtidal rock X X X X X X X X X X X X X	Indicator category Indicator Extent Blue mussel beds Extent Intertidal rock Extent Reefs Extent Sea grass beds Extent Sea grass beds Extent Shallow subtidal sediment Extent Subtidal rock Extent Subtidal sediment Extent Subtidal sediment Extent Subtidal rock Extent Extent Subtidal rock Extent Extent Subtidal sediment Extent Extent Subtidal rock Extent Extent Subtidal sediment Extent Extent Extent Extent Extent Extent Subtidal sediment Extent	

Quality	Species composition	Amount & number of decomposers/decomposition rate				х	
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level	х		х		
Quality	Species composition	Net productivity by species (kcal/ha/yr)	Х		Х	Х	
Quality	Species composition	Non-native species	х		Х		
Quality	Species composition	Population age/size structure (recruitment, age classes, male:female ratios, age at maturity, growth rates)	х		х		
Quality	Cultural: Nature	Visibility of wildlife (birds, mammals, fish)					Х
Quality	Cultural: Nature	Presence of flagship species					X
Quality	Cultural: Nature	Presence of rare (red list) species					X
Quality	Cultural: Nature	Species diversity					X
Quality	Cultural: Nature	Favourable condition of SSSIs/MPAs					X
Quality	Cultural: Nature	Quality of bathing waters					X
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk))					х
Quality	Cultural: Facilities	Number of organised events					Х
Quality	Cultural: Facilities	Presence of clubs, schools, training centres					x

Marine (Spatial Configuration and Ecosystem Service Flow) Ecosystem Services

Marine (Spatial	Configuration and Ecosystem Se	ivice riow)	LCOSys	stem Ser	VICES			
Asset attribute	Indicator category	Indicator	Wild animals, plants, algae & outputs	Aquaculture	Water quality	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Transition and connectivity from subtidal to coastal and terrestrial habitats	Х			х		
ES flow		Carbon sequestered & greenhouse gases fixed					х	
ES flow		Fish, shellfish, seaweed and other products	х	x				
ES flow		Maintenance of sustainable ecosystems/life cycle stages	х			х		
ES flow		Water quality (chemical & biological, including viral & bacterial)			х			
ES flow	Cultural: Experiential & physical use	Number of visits						х
ES flow	Cultural: Experiential & physical use	Duration of visits						х
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)						х
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects						х

Mountains, moorlands & heaths (Quantity and Quality)

Ecosystem Services

Wioumanis	s, mooriands & neaths (Qua	illity and Quanty)	⊑ cosys	tem Serv	/1062					
Asset attribute	Indicator category	Indicator	Water supply	Reared animals & outputs	Water quality	Mass stabilisation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Quantity	Extent	Blanket bog	Х		х	Х	х	Х	Х	Х
Quantity	Extent	Bracken				х	х	х	Х	
Quantity	Extent	Dwarf shrub heath		Х		Х	Х	Х	Х	Х
Quantity	Extent	Inland rock, scree and pavement (above the moorland line)						х		х
Quantity	Extent	Lakes	х					Х		х
Quantity	Extent	Mountain heath and willow scrub					х	х	Х	Х
Quantity	Extent	Reservoirs	х							Х
Quantity	Extent	Rivers	х					х		Х
Quantity	Extent	Semi-natural grassland (above moorland line)		х		х	х	х	х	х
Quantity	Extent	Upland flushes fens and swamps	х				х	х	Х	Х
Quantity	Extent	Woodland (above moorland line)			Х	Х	Х	Х	Х	Х
Quantity	Extent	Wood pasture (above moorland line)								Х
Quality	Hydrology & geomorphology	Extent of artificial drainage	х		х	Х	Х	Х	Х	
Quality	Hydrology & geomorphology	Lack of physical modifications of water bodies					х	х		
Quality	Hydrology & geomorphology	Natural aquifer function: recharge & discharge	х							
Quality	Hydrology & geomorphology	Naturalness of flooding regime					Х			
Quality	Hydrology & geomorphology	Naturalness of flow regime	Х				Х	Х		
Quality	Hydrology & geomorphology	Naturalness of lake hydrological regime					х	х		

Quality	Hydrology & geomorphology	Naturalness of water level regime			х	x	х	Х	Х	
Quality	Nutrient (& chemical) status	Atmospheric deposition: exceedance of critical loads						х	x	
Quality	Soil/sediment processes	Peat depth			Х				Х	
Quality	Soil/sediment processes	Soil carbon/organic matter content			х	X		Х	Х	
Quality	Soil/sediment processes	Soil erosion & gullying of peatland			х	х			х	
Quality	Species composition	Invasive non-native species						х		
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level						х		
Quality	Vegetation	Plant growth rate		Х						
Quality	Vegetation	Above & below ground biomass			х	х	х		х	
Quality	Vegetation	Proportion of peat mass actively forming peat				х		x	х	
Quality	Vegetation	Surface/vegetation roughness			х	Х	Х			
Quality	Vegetation	Vegetation cover/bare soil	Х		х	Х	х	Х	Х	
Quality	Vegetation	Vegetation litter amount and structure						х		
Quality	Vegetation	Vegetation next to water bodies			х	x	х			
Quality	Vegetation	Vegetation structure/structural diversity						х		
Quality	Cultural: Nature	Visibility of wildlife (birds, mammals, plants, reptiles)								х
Quality	Cultural: Nature	Presence of flagship species								X
Quality	Cultural: Nature	Presence of rare (red list) species								Х
Quality	Cultural: Nature	Species diversity								X
Quality	Cultural: Nature	Habitat mosaics								X
Quality	Cultural: Nature	Naturalness of watercourses								Х
Quality	Cultural: Nature	Favourable condition of SSSIs								Х
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)								х
Quality	Cultural: Landscape, seascape & urban green space	Uninterrupted views – absence of pylons, turbines								х

Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)				х
Quality	Cultural: Quietness	Tranquillity				X
Quality	Cultural: Accessibility	Mean number of perimeter access points per km				x
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)				х
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)				х

Mountains, moorlands & heaths (Spatial Configuration and Ecosystem Service Flow)

Ecosystem Services

Asset attribute	Indicator category	Indicator	Water supply	Reared animals & outputs	Water quality	Mass stabilisation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Distribution of flood mitigating land in relation to infrastructure & settlements					х			
Spatial config.		Distribution of habitats, in relation to water quality source-pathway-receptor			х					
Spatial config.		Distribution of habitats, other vegetation and boundary features mitigating soil erosion and landslip risk.				х			х	
Spatial config.		Mosaics/spatial distribution of different habitats						х		
Spatial config.		Patch size (lowland heath)						x		
Spatial config.		% population who can access 2ha of green space within 2 miles of home								X
ES flow		Availability of water for abstraction	Х							
ES flow		Carbon sequestered & greenhouse gases fixed, by soil/vegetation							х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages						х		
ES flow		Number and type of reared animals		Х						
ES flow		Regulation of flow regime for peak events					х			
ES flow		Stabilisation of soils				Х				

ES flow		Water quality (chemical & biological, including pH, viral & bacterial)		х			
ES flow	Cultural: Experiential & physical use	Number of visits					x
ES flow	Cultural: Experiential & physical use	Duration of visits					x
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)					x
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects					x
ES flow	Cultural: Scientific/educational	Number of school visits					X
See Freshwaters tables for catchment services:			Υ	Υ	Υ		

Urban (Quality and Quantity) Ecosystem Services

Urban (Q	LCUSYS	tem Ser	VICES							
Asset attribute	Indicator category	Indicator	Water supply	Water quality	Air quality	Noise regulation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Quantity	Extent	Blue space - open water: ponds, lakes, reservoirs rivers, canals, streams, SUDs and associated vegetation						х	х	х
Quantity	Extent	Green space: not semi-natural			x	Х		х	Х	Х
Quantity	Extent	Open mosaic habitats						Х		
Quantity	Extent	Semi-natural habitats			X	X		Х	Х	Х
Quantity	Extent	Urban/street trees, canopy cover			X	X			Х	Х
Quantity	Extent	Woodland, scrub and hedge			X	Х		Х	Х	Х
Quality	Hydrology & geomorphology	Naturalness of water level regime							х	
Quality	Hydrology & geomorphology	Sustainable Urban Drainage Schemes						х		
Quality	Nutrient (& chemical) status	Soil chemical status						х		
Quality	Soil/sediment processes	Degree of compaction						х		
Quality	Species composition	Number of trophic levels & community composition in each level						х		
Quality	Vegetation	Building integrated Vegetation including green roofs & walls			х	х				
Quality	Vegetation	Surface/vegetation roughness			х			х		
Quality	Vegetation	Vegetation cover/bare soil/concrete or tarmac			х	х		х	х	
Quality	Vegetation	Vegetation structure/structural diversity						х		
Quality	Cultural: Nature	Visibility of wildlife (birds, mammals; flowers, butterflies)								х
Quality	Cultural: Nature	Presence of flagship species								Х

Quality	Cultural: Nature	Presence of rare (red list) species				X
Quality	Cultural: Nature	Species diversity				Х
Quality	Cultural: Nature	Favourable condition of SSSIs				Х
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)				х
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)				x
Quality	Cultural: Accessibility	Mean number of perimeter access points per km				x
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)				x
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)				x

Urban (Spatial Configuration and Ecosystem Service Flow) Ecosystem Services

	patiai comiguration and Eco	d Ecosystem Service Flow) Ecosystem Services								
Asset attribute	Indicator category	Indicator	Water supply	Water quality	Air quality	Noise regulation	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial		Distribution of habitats & trees in relation to			v	V				
config.		buildings & transport routes			X	Х				
Spatial		Green grids – linking urban & rural green						х		
config.		space								
Spatial config.		Patch size, shape and edge						X		
Spatial		Position of habitats and trees to provide							х	
config.		cooling to housing and buildings							^	
Spatial config.		Proximity to other habitats						Х		
Spatial config.		% population who can access 2ha of green space within 2 miles of home								х
ES flow		Carbon sequestered & green house gases fixed, by soil/vegetation							х	
ES flow		Local urban cooling							Х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages						х		
ES flow		Noise abatement: loudness and frequency				Х				
ES flow		Air pollutants removed by vegetation			Х					
ES flow	Cultural: Experiential & physical use	Number of visits								х
ES flow	Cultural: Experiential & physical use	Duration of visits								х

ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)						x
ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects						х
ES flow	Cultural: Scientific/educational	Number of school visits						X
See Freshwa	ters tables for catchment services:		Υ	Y		Y		

Woodlands (Quantity and Quality) Ecosystem services

VVOodiai	nds (Quantity and Quai	ity)	LCUSys	tem ser	VICES						
Asset attribute	Indicator category	Indicator	Materials from plants, animals & algae	Plant-based energy	Water supply	Water quality	Air quality	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Quantity	Extent	Broadleaved, mixed & yew woodland	Х	Х			Х		Х	Х	Х
Quantity	Extent	Coniferous woodland	Х	х			Х			Х	Х
Quantity	Extent	Individual trees/ veteran trees							Х	х	Х
Quantity	Extent	Woodland Priority Habitats							Х		Х
Quality	Hydrology & geomorphology	Naturalness of flooding regime							х		
Quality	Nutrient (& chemical) status	Atmospheric deposition: exceedance of critical loads							х		
Quality	Nutrient (& chemical) status	Soil nutrient status								х	
Quality	Nutrient (& chemical) status	Degree of compaction	х	х							
Quality	Soil/sediment processes	Soil biota							Х		
Quality	Soil/sediment processes	Soil moisture	х	х							
Quality	Soil/sediment processes	Soil carbon/organic matter content								Х	
Quality	Soil/sediment processes	Soil Type	х	х							
Quality	Soil/sediment processes	Soil mycorrhizal associations							Х		
Quality	Species composition	Invasive non-native species							х		
Quality	Species composition	Pest species	х	х							
Quality	Species composition	Naturalness of biological assemblage: number of trophic levels & community composition in each level							х		
Quality	Vegetation	Age structure (including veteran trees) and regeneration	х						х		

Quality	Vegetation	Deadwood – including standing					Х		
Quality	Vegetation	Leaf surface area and duration across the year				х			
Quality	Vegetation	Plant growth rate	Х	Х				Х	
Quality	Vegetation	Above & below ground biomass						х	
Quality	Vegetation	Tree health	Х	х			х	х	
Quality	Vegetation	Vegetation structure/structural diversity					х		
Quality	Cultural: Nature	Visibility of wildlife (birds, mammals, butterflies)							х
Quality	Cultural: Nature	Presence of flagship species							Х
Quality	Cultural: Nature	Presence of rare (red list) species							Х
Quality	Cultural: Nature	Species diversity							Х
Quality	Cultural: Nature	Favourable condition of SSSIs							Х
Quality	Cultural: Landscape, seascape & urban green space	Size of environmental space (ha)							х
Quality	Cultural: Culture & history	Designated Historic Environment Assets (World Heritage Sites, Scheduled monuments (% at risk), Historic Parks & Gardens, Listed Buildings, Conservation Area)							х
Quality	Cultural: Accessibility	Mean number of perimeter access points per km							х
Quality	Cultural: Accessibility	Public Rights of Way / permissive paths; footpaths, bridleways, byway – length, density (km/ha)							х
Quality	Cultural: Accessibility	Presence of paths accessible to all – e.g. wheelchairs, pushchairs - length, density (km/ha)							х

Woodlands (Spatial Configuration and Ecosystem Service Flow)

and Ecosysten	n Service Flow)	Ecosyst	em serv	ices							
Asset attribute	Indicator category	Indicator	Materials from plants, animals & algae	Plant-based energy	Water supply	Water quality	Air quality	Flood protection	Maintenance of nursery pops & habs	Climate regulation	Cultural services
Spatial config.		Connectivity for small woodlands							x		
Spatial config.		Distribution of woodland in relation to settlements					х				
Spatial config.		Patch size, shape and edge							х		
Spatial config.		% population who can access 2ha of green space within 2 miles of home									х
ES flow		Carbon sequestered & green house gases fixed, by soil/vegetation								х	
ES flow		Maintenance of sustainable ecosystems/life cycle stages							х		
ES flow		Air pollutants removed by vegetation					Х				
ES flow		Production of timber, paper and other wood products	х								
ES flow		Wood-based fuel harvested		х							
ES flow	Cultural: Experiential & physical use	Number of visits									х
ES flow	Cultural: Experiential & physical use	Duration of visits									х
ES flow	Cultural: Experiential & physical use	Range of activities undertaken (number of people carrying out each activity, frequency, time spent)									х

ES flow	Cultural: Scientific/educational	Number of research projects; PhD / Masters projects						х
ES flow	Cultural: Scientific/educational	Number of school visits						х
See Freshwaters	tables for catchment serv	ices:		Υ	Υ	Υ		

Geodiversity (All)			Ecosystem Services
Asset attribute	Indicator category	Indicator	Geodiversity services
Asset attribute	mulcator category	Accessibility of geological features, formations and land	
Quality	Cultural: Accessibility	forms	X
	Cultural: Landscape, seascape & urban		
Quality	green space	Geological designated sites	x
Quality	Cultural: Facilities	Presence of geological and geoheritage interpretation	x
Quality	Cultural: Nature	Favourable condition of designated geosites	X
Quality	Formative geological processes	Active geomorphological processes; terrestrial, coastal & marine	x
Spatial Configuration		Geological designations creating green space	Х