

The UK National Ecosystem Assessment.

Putting the Value of Nature into policy and decisions.

UK Government

February 2012



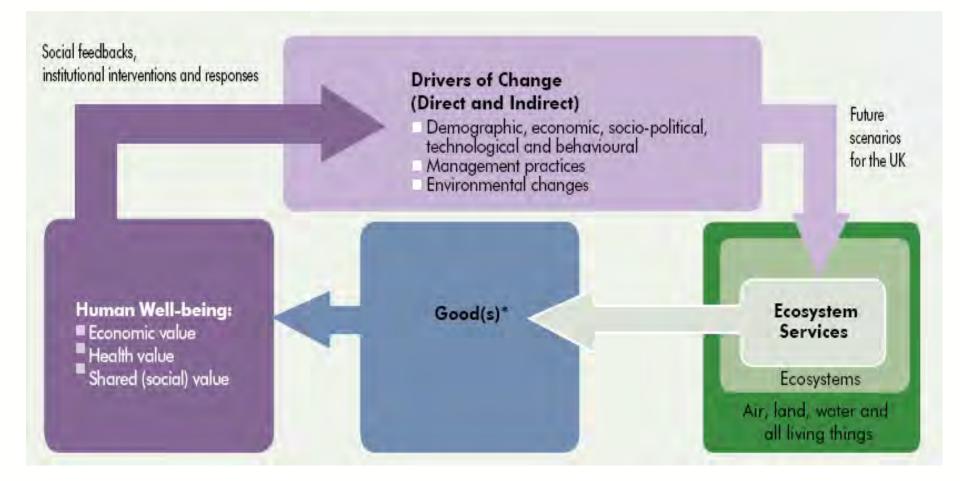


Analysis of UK's natural environment - Benefits for People



Conceptual Framework





Broad Habitats









Freshwaters -Openwaters, Wetlands and Floodplains

Urban

Marine

Coastal Margins





Mountains, moors and heathlands

Semi-natural grasslands





Enclosed farmland

Woodlands

Summary of changes to ecosystems

Service Group	Final Ecosystem Service	Mountains, Moorlands & Heaths	Semi-natural Grasslands	Enclosed Farmland	Woodlands	Freshwaters – Openwaters, Wetlands & Floodplains	Urban	Coastal Margins	Marine
	Crops		↔	•		•	7	8	
5	Livestock/Aquaculture	V	7	⇔	↔	8	↔	8	0
Provisioning	Fish				-		↔	8	ŧ
Prov	Trees, standing vegetation, peat	9	↔	0	(7)	9	⇔	9	
	Water supply	⇔	ы (9	↔	9	⇔	~	
-	Wild species diversity	↔	•	•	0	8	↔	8	9
Cultural	Environmental settings: Local places	⇔	↔	~		3	⇔	Θ	~
Cul	Environmental settings: Landscapes/seascapes	Θ	\ominus	↔	8	•	÷	0	~
	Climate	\ominus	Θ	7	a	↔	9	a	R
	Hazard	8	Θ	N	a	9	9	Θ	¥
	Disease and pests	↔	↔	±	N	8	~	±	R R
Regulating	Pollination	8	9	8	↔		⇔	↔	
Regu	Noise	↔	↔	~	3	↔	¥	Θ	
	ର ର Water quality	⇔	a	±	Θ	(±)	±	~	↔
	G G G G G G G G G G G G G G G G G G G	⇔		9	Θ	9	♥	N	
	-9: a Air quality	↔	Θ	7	7	↔	⇔	↔	~

Figure 5 Relative importance of Broad Habitats in delivering ecosystem services and overall direction of change in service flow since 1990. This figure is based on information synthesized from the habitat and ecosystem service chapters of the UK NEA Technical Report (Chapters 5–16), as well as expert opinion. This figure represents a UK-wide overview and will vary nationally, regionally and locally. It will therefore also inevitably include a level of uncertainty; full details can be found in the Technical Report. Arrows in circles represent where there is high evidence for or confidence in the direction of service flow amongst experts; arrows in squares represent where there is less evidence for or confidence in the direction of service flow. Blank cells represent services that are not applicable to a particular Broad Habitat. Importance of Broad Habitat for delivering the ecosystem service

High Medium – High Medium – Low

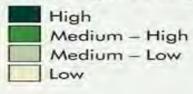
Direction of change in the flow of the service

- ↑ Improving
- **7** Some improvement
- ↔ No net change
- ± Improvement and/or deterioration in different locations
- Some deterioration
- ✤ Deterioration
- ➤ Unknown



Service Group	Final Ecosystem Service	Mountains, Moorlands & Heaths	Semi-natural Grasslands	Enclosed Farmland
Ę	Crops Livestock/Aquaculture	•	↔ 7	e ()
Provisioning	Fish Trees, standing vegetation, peat	9	↔	3
	Water supply Wild species diversity	Θ	R R	4 6
Cultural	Environmental settings: Local places Environmental settings: Landscapes/seascapes			0 0

Importance of Broad Habitat for delivering the ecosystem service



Drivers of change



UK NEA Broad Habitat	Habitat Change*	Pollution & Nutrient Enrichment	Overexploitation	Climate Change	Invasive Species
Mountains, Moorlands & Heaths	7	. →	3	3	•
Semi-natural Grasslands	9	(→)	3	•	•
Enclosed Farmland	. ⇒	9	•	7	
Woodlands	•	>	8	7	
Freshwaters – Openwaters, Wetlands & Floodplains	•	8	7	7	
Urban	ə	. →	7	7	•
Coastal Margins	7	(→)	3	•	3
Marine	7	9	7	•	•

Figure 13 Relative importance of, and trends in, the impact of direct drivers on UK NEA Broad Habitat extent and condition. *Cell colour* indicates the impact to date of each driver on extent and condition of Broad Habitats since the 1940s. The *arrows* indicate the current (since the 1990s) and ongoing trend in the impact of the driver on extent and condition of the Broad Habitat. Change in both impacts or trends can be positive or negative. This figure is based on information synthesized from each Broad Habitat chapter of the UK NEA Technical Report (Chapters 5–12) and expert opinion. This figure presents UK-wide impacts and trends, and so may be different from those in specific sub-habitats or regions; however more details can be found in the individual Broad Habitat chapters. *Habitat change can be a result of either land use change or deterioration/improvement in the condition of the habitat. Driver's impact on extent and condition of Broad Habitats since the 1940s

Very high High Moderate

Low

Driver's current (since 1990) and ongoing trend

Decreasing impact

->

7

- Continuing impact
- Increasing impact Very rapid increase of the impact

Drivers of change



UK NEA Broad Habitat	Habitat Change*	Pollution & Nutrient Enrichment	Overexploitation	Climate Change
Mountains, Moorlands & Heaths	7	●)	3	3
Semi-natural Grasslands	9	. →	3	•
Enclosed Farmland	•	9	•	7
Woodlands	•	•	8	7
Freshwaters – Openwaters, Wetlands & Floodplains	•	8	3	7

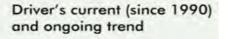
Driver's impact on extent and condition of Broad Habitats since the 1940s

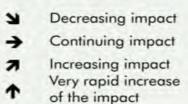
Very high

Moderate

High

Low





luina Ecos	system Servio	Ces Ces		People	
.. <i>.</i> . <i>.</i> . <i>.</i> . <i>.</i> ..			W	ell-being value	
Ecosystem processes/ Intermediate services	Final ecosystem services	Good(s)*	Economic	Health	Sharec social
	Crops, livestock, fish	Food	£	+/-	©/8
Primary production	Trees, standing vegetation, peat	Fibre	£	+/-	©/8
Water cycling	Water supply	Energy	£	+/-	©/⊗
Soil formation	Climate regulation	Drinking water	£	+/-	©/8
	Discours & another statics	Natural medicine	£	+/-	©/8
Nutrient cycling	Disease & pest regulation	Recreation/Tourism	£	+/-	©/8
Decomposition	Detoxificaton & purification in air, soils & water	Pollution/noise control	£	+/-	©/8
Decempesition	Pollination	Disease/pest control	£	+/-	0/8
Weathering	Hazard regulation	Equable climate	£	+/-	0/8
		Flood control			
Ecological interactions	Noise regulation	Erosion control	£	+/-	©/⊗
Evolutionary processes	Wild species diversity	Aesthetic/Inspiration	£	+/-	©/8
	Environmental settings	Spiritual/Religious	£	+/-	©/8
Undiscovered	Undiscovered services	Undiscovered	£	+/-	©/⊗

Figure 10 The full set of ecosystem processes, services, goods/benefits and values used in the UK NEA. Note that some ecosystem services can be both intermediate and final services. For simplicity, in this figure, services are shown only in the most final position that they occupy. Services such as pollination and climate regulation that also play important roles further back in the chain are not represented here. Cells with no colour are ecosystem processes/services that were not in the Millennium Ecosystem Assessment classification. *Note that the term good(s) includes all use and non-use, material and non-material outputs from ecosystems that have value for people. Source: adapted from Fisher *et al.* (2008).

Millennium Ecosystem Assessment categories Cultural Provisioning Regulating Supporting



The **value of UK fish landings** is about £600 million per annum (p.a.), while that of aquaculture (fish and shellfish farming) is around £350 million p.a..

Timber values are just under £100 million p.a.

Biodiversity pollination services are estimated at £430 million p.a.





The **water quality** benefits of inland wetlands may be as high as £1,500 million p.a.

The total value of **net carbon sequestered** currently by UK woodlands is estimated at £680 million p.a.

3,000 million outdoor recreational visit each year generate a social value in excess of £10,000 million annually



Valuing ecosystem services: non-monetary valuation







Table 4.2 The importance of different biodiversity groups in underpinning the final ecosystem services based on expert opinion. Importance is colour-coded: high (marcon), medium (beige), low (green), unimportant on the basis of available evidence (blank). The size of the circle in each cell is used to illustrate the level of uncertainty in the available evidence. Further details are given in Appendix 4.1.

Importance of different aspects of biodiversity

			_		_			Biodive	ersity g	roups		_					
	Alternation and an	MILLION BUILDING	1	Ignu		Lower plants			Ingner plants		Invertebrates		181	Amphibians	Reptiles	Birds	Mammals
Final ecosystem services (based on the UK NEA Conceptual Framework)	Terrestrial	Marine	Non-lichens	Lichens	Phytoplankton	Macroalgae	Bryophytes	Se agrasses	Land plants	Terrestrial	Marine	Freshwater	Marine				
Crops, livestock, fish			0			0				0	0					0	
Trees, standing vegetation & peat	0		0	•	14	0	•	0	0	0				•			0
Climate regulation		0						0									0
Water supply							0	1									1.7
Hazard regulation		0	0	0		•		0									
Waste breakdown & detoxification	0	0	•		•	Ŭ.		0	0	•	•			•			
Wild species diversity		0	0			0				0		O	0	0			0
Purification			0		1			-		121	0	1	1				
Disease & pest regulation		0			0				0		0	0				0	
Pollination						-											
Meaningful places*		0	-0			-10	0	•								0	
Socially valued land & waterscapes*	0	0	P.	0		a		×	0	•	0	0	0		0	0	0

Note: For the purposes of the Cultural Services chapter (Chapter 16), Cultural services have been combined into 'environmental settings'.

High Importance	Amount of evide observations, mo	Medium Importance		of evidence fons, mod	ce (theory, els) →	Low Importance		f evidence ons, mode	
1		5	0	0	0	5			
dot		eem elo	0	0	0	100	0		
18 2	10.00	1 A E	a.	0		3 5			100

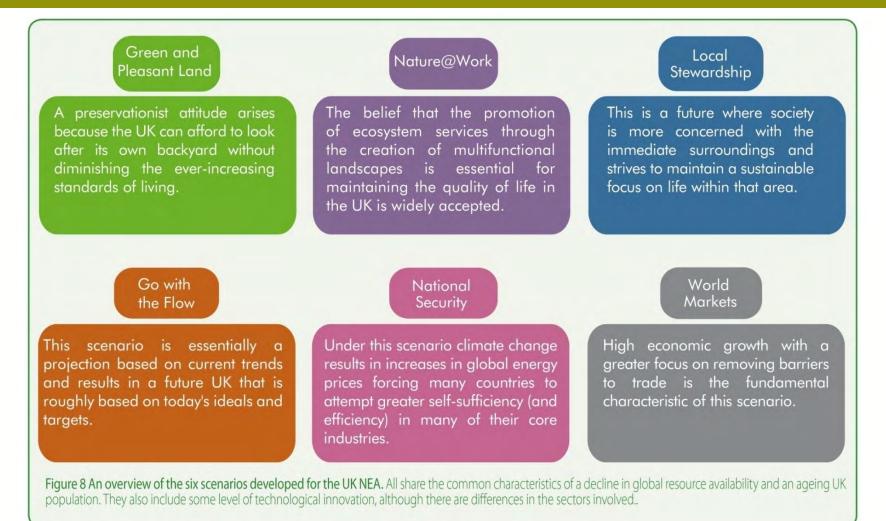


Importance of different aspects of biodiversity

	1				_			Biodiv	ersity g	roups	
		Microorg anti-mi	Cined	-		Lower plants			Higher plants		Savenaar te Aul
Final ecosystem services (based on the UK NE/ Conceptual Framewo		Matine	Non-lichens	Lichens	Phytoplankton	Macroalgae	Bryophytes	Se agrasses	Land plants	Terrestrial	A series
Crops, livestock, fish											C
Trees, standing vegetation & peat	0		0	0		0	0	0	0	0	
Climate regulation		10		1	0		-	0	O		C
Water supply		0				1.50	O	- L	C		
Hazard regulation	0	O	0	0			0		O		
		_					-	_			
			Medium Importance		of evidence (ors, models		Low		sount of evid servations, m	ence (theory, iodels) -)	
time of the second			Level of Agreement	00	000	000	Level of	1			

Scenarios development





NATURAL ENVIRONMENT WHITE PAPER

MHMGovernment.

The Natural Choice:

securing the value of nature

The Natural Choice: securing the value of nature



White Paper





An integrated approach: landscape scale approach seeking multiple benefits from land



Multiple uses and benefits of the natural environment

Freshwaters can provide providently envices including fish and water, blodversty, calcula services including recrustion, landscape and cultural heritage, regulating services including flood management, improving water quality

Woodlands can provide: proteitioning services including timber and water supply, biodiventity caftared services including recreation, landscape and cultural heritage, regulating services carbon storage, flood management, noise reduction, improving water, soil and air quality

Ecological restoration We need to improve the quality of natural habitats in both town and country, and to plug the gap in our ecological network. This could involve work to address the impacts of past activities, make links between existing stats, or identify new opportunities to support heality functioning ecosystems across a landscape.

Urban acceptams can provide providential anytops including food from allotments and gardens, water supply, biodestaty, cultural netwood including neuroation, landscape and cultural horitage, regulating anytops including cooling, network reduction, flood managament, politation, improving water and at quality Uplands and grassiands can provide providening annote including anaryy (in the form of wind power), water supply biodwarty, catarel anvices including recruition, landscape and cultural heritage, regulating aevices including carbon storage. Bood management, polination, improving water and sol quality Farmland can provide:

Most including
prostaining services including trops,
wind power),
ivestock, energy, caltural services
ivestock, energy, caltural services
ivestock, energy, caltural services
including tremation, landscape
and cultural heritage, landscape
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Centra and enex can provide; pretaining service including fait, biodwardy; cultural services including neuroscient, tendinape and cultural horitage; regulating services including carbon storage, flood management, improving water and air cuality

Growing a green economy







-MGovernment



The Natural Choice: securing the value of nature



NEA reports available at:

http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx

White Paper on the Natural Environment available at: http://www.defra.gov.uk/environment/natural/whitepaper/