Department
for Environment
Food & Rural Affairs

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England Natural Environment Indicators

May 2013

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Cover photograph:

Buttercups situated in the High Weald Area of Outstanding Natural Beauty (AONB)

Contents

Introduction

The Natural Environment White Paper, published in 2011, set out the Government's strategy for valuing nature in our society and ensuring that it is available for use by future generations. The White Paper outlined four ambitions aimed at mainstreaming the value of nature across society. These were:

- Protecting and Improving the Natural Environment
- Growing a Greener Economy
- Reconnecting People and Nature
- International and EU Leadership

Within these ambitions there were 92 commitments. The England Natural Environment Indicators (ENEI) publication has been produced under commitment 90 of the White Paper:

> *"We will develop a set of key indicators...to track progress on the ambitions of this White Paper. These will include a new, compact set of biodiversity indicators for the England Biodiversity Strategy. We will consult on them and finalise them by Spring 2012."*

The purpose of the ENEIs is to track progress against the broad ambitions of the White Paper as outlined above, to communicate this to stakeholders and interested users and to provide a robust evidence base on which to base future policy interventions. The indicators selected for the publication have been categorised according to one or more of the ambitions, represented by shaded tabs at the edge of each page.

The updated indicators for the England Biodiversity Strategy, referred to in the second part of the commitment, were consulted on and published in May 2012 and can be found here.

Traffic Light Assessment

Each indicator is composed of one or more measures which where possible show trends over time. Several indicators are represented by a single measure, but where data cannot be combined logically, indicators are supported by more than one measure. Each measure is summarised or assessed separately using a set of 'traffic lights'. The traffic lights show an assessment of change over time. They do not show whether the measure has reached any published or implied targets or whether the status is 'good' or 'bad'.

The traffic lights are determined by identifying a period over which the change is to be assessed and comparing the value of the measure in the base or start year with the value in the end year.


Improving


Little or no overall change


Deteriorating


Not yet assessed due to insufficient or no comparable data

Where possible the assessment has been made by evaluating trends using statistical analysis techniques. The assessment is either made by Defra statisticians in collaboration with the data providers or undertaken by the data providers themselves. A green or red traffic light is only applied when there is sufficient confidence that the change is statistically significant and not simply a product of random fluctuations.

For some indicators, it is not possible to formally determine statistical significance and in such cases the assessment has been made by comparing the difference between the value of the measure in the base or start year and the value in the end year against a 'rule of thumb' threshold. The standard threshold used is three percentage points. Where the data allow it, a three year average is used to calculate the base year to reduce the likelihood of any unusual year(s) unduly influencing the assessment. Where an indicator value has changed by less than the threshold of three percentage points, the traffic light has been set at amber. The choice of three percentage points as the threshold is arbitrary but is commonly used across other Government indicators and use of this approach is kept under review.

The traffic lights only reflect the overall change in the measure from the base to latest year and do not reflect fluctuations during the intervening years.

Where data are available, two assessment periods have been used:

1. Long-term – an assessment of change since the earliest date for which data are available. If the earliest year for which data is available is after 2000, no long term assessment is made.
2. Short-term – this assessment period varies between measures. For consistency, for the measures also used in the Biodiversity Indicator set the

assessment is change since 2000 (or the closest date for which data are available)[1]. For those measures which are obtained from other data sources the short term period of assessment varies from a rolling three-year to rolling 10-year period. This is dependent on both data availability and the timescale over which significant change is expected to be observed for that measure.

The individual measures also have a third marker showing the direction of change in the last year. This period is too short for a meaningful assessment. However, when it exceeds a one percentage point threshold, the direction of change is given simply as an acknowledgement of very recent trends and as a possible early sign of emerging trends.

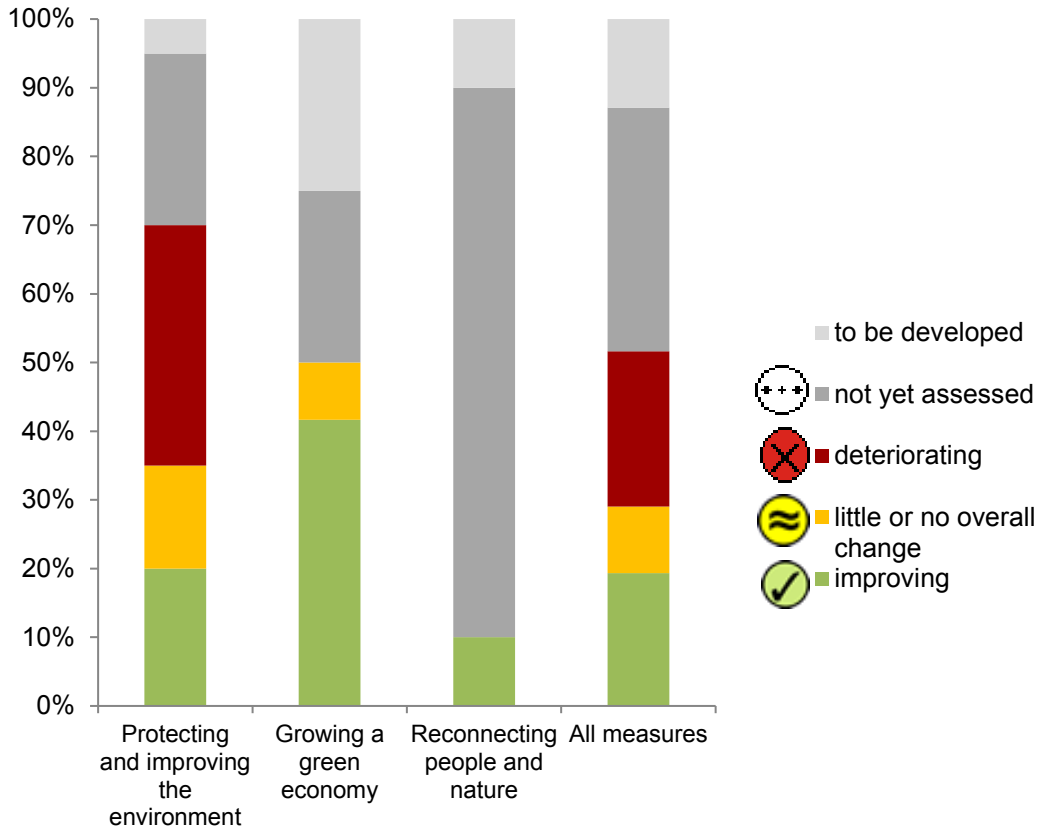
[1] The period of the short-term assessment used in the Biodiversity Indicators is currently being considered and may change in the 2013 publication, future updates of these indicators within the ENEI set will use the same period of assessment.

Summary of Indicator Assessments

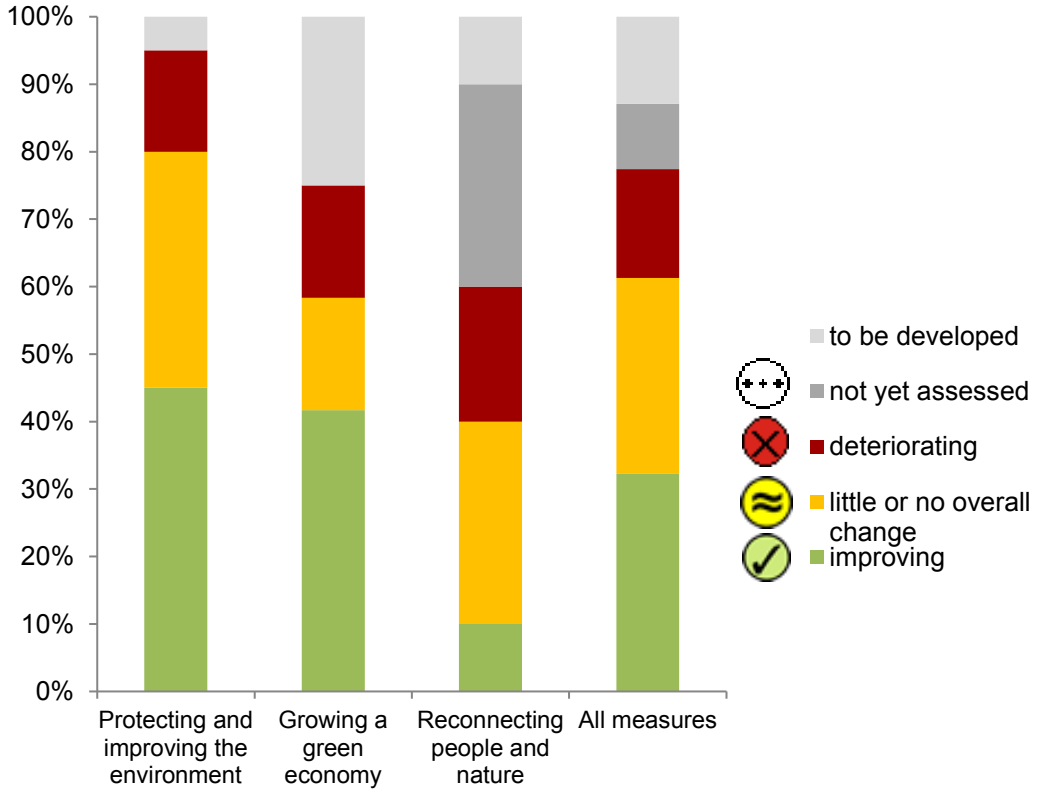
Indicator	Measures	Long Term	Short Term
1. Species in the Wider Countryside	Breeding farmland birds	Deteriorating	Deteriorating
	Butterflies of the wider countryside on farmland	Deteriorating	Deteriorating
	Widespread bats	Deteriorating	Improving
	Breeding wetland birds	Little or no overall change	Little or no overall change
	Wintering water birds	Improving	Deteriorating
	Breeding woodland birds	Deteriorating	Little or no overall change
	Butterflies of the wider countryside in woodland	Deteriorating	Little or no overall change
	Breeding seabirds	Little or no overall change	Little or no overall change
2. River Water Quality	Proportion of rivers with biological quality classed as good or high	Not yet assessed	Little or no overall change
	Proportion of rivers that pass on chemical status	Not yet assessed	Improving
3. Marine Ecosystem Integrity	Fish size class	Deteriorating	Little or no overall change
	Marine Litter	Deteriorating	Improving
4. Priority species and habitats	Number of priority species that are stable or increasing	Not yet assessed	Improving
	Number of priority habitats that are stable or increasing	Not yet assessed	Improving
5. Land Use	Land Use (context)	Not assessed	Not assessed
	Development on undeveloped land	To be developed	To be developed
	Percentage of woodland in active management	Not yet assessed	Improving

Indicator	Measures	Long Term	Short Term
6. Natural Stocks	Sustainable fisheries	Improving	Improving
	Water abstraction	Improving	Improving
	Forest carbon stock	Improving	Improving
	Soil carbon concentration	Little or no overall change	Little or no overall change
7. Raw Material Consumption	Raw material consumption	Improving	Improving
8. National Environmental Accounts	National environmental accounts	To be developed	To be developed
9. Integrating biodiversity and natural environment considerations into business activity	Integrating biodiversity and natural environment considerations into business activity	To be developed	To be developed
10. Public Engagement with the Natural Environment	Proportion of people visiting the natural environment several times or more a week	Not yet assessed	Little or no overall change
	Number of visits made by children	Not yet assessed	Deteriorating
	Conservation volunteering	Improving	Deteriorating
11. Ease of access to local woodland, green space and countryside	Ease of access to all green space	To be developed	To be developed
12. Environmental Quality and Health	Number of air pollution days classed as moderate or higher: urban	Not yet assessed	Not yet assessed
	Number of air pollution days classed as moderate or higher: rural	Not yet assessed	Not yet assessed
	Mortality caused by anthropogenic air pollution	Not yet assessed	Not yet assessed
	Percentage of people affected by noise	Not yet assessed	Little or no overall change
13. International and EU	Not assessed	Not assessed	Not assessed

Long Term Assessments by NEWP Ambition



Short Term Assessments by NEWP Ambition



For the long term assessment period six of the measures (19%) show improvement, three (10%) show little or no change and seven (23%) show deterioration. The remainder have not yet been assessed due to unavailability of data. Over the short term assessment period ten measures (32%) show improvement, nine (29%) show little or no change and five (16%) show deterioration. Again, the remainder have not yet been assessed.

Within the individual ambitions, the proportion of measures assessed as improving is higher for the short term assessments than the long term assessments; this is particularly true for Protecting and Improving the Environment where there are over twice as many improving assessments over the short term than over the long term period.

For the short term assessments in the Growing a Green Economy ambition, two measures (16%) show deteriorating assessments and seven measures (58%) show improvements or little or no overall change. For the long term assessments five (42%) are improving and one (8%) shows little or no change, with the remainder not able to be assessed.

A high proportion of measures in the Reconnecting People and Nature ambition are not yet able to be assessed due to there not being a long enough time series to make a meaningful assessment. For the short term assessments for this ambition there are six measures that are able to be assessed; one shows improvement, three show little or no overall change and two show deterioration.

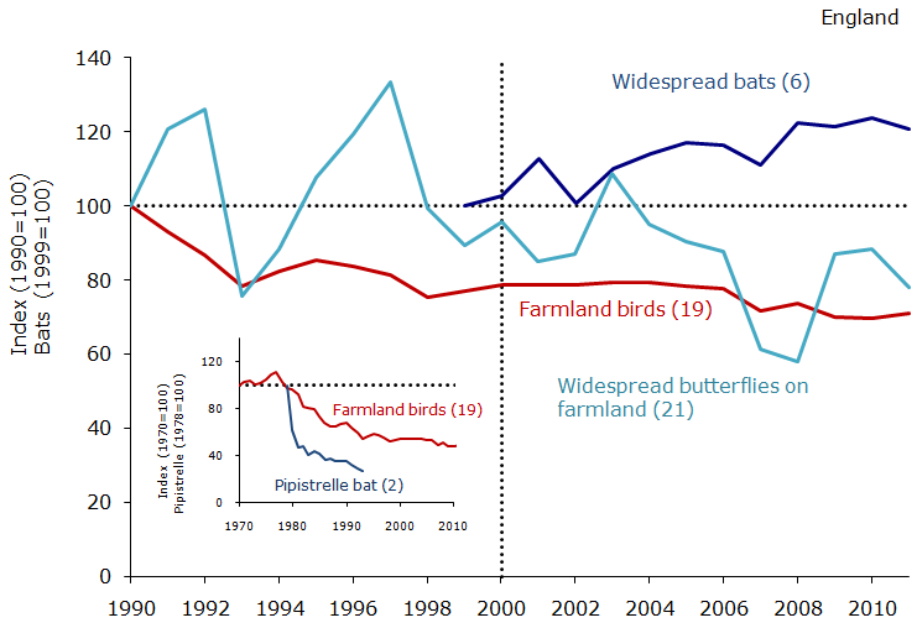
1. Species in the Wider Countryside

This indicator relates to the ambition in the Natural Environment White Paper to protect and improve biodiversity in England. Statistics on the populations of birds, butterflies and bats reflect broader biodiversity changes in the farmland, wetland, woodland and sea environments.

1a) Population of farmland birds, butterflies and bats

This indicator presents changes in the abundance of widespread species in the farmed landscape. It shows changes in the population size of 19 breeding farmland birds and 21 butterflies recorded on farmland habitats, and in the combined population size of six bat species, which use a variety of habitats including farmland.

Figure 1.1 Populations of widespread breeding birds, butterflies and bats on farmland, 1990 to 2011



Source: BCT, BTO, BC, CEH, Defra, JNCC and RSPB.
Notes:
1. Figures in brackets give number of species.
2. Main bat indicator (above) is a composite index of six species; Daubenton's bat, noctule, serotine, lesser horseshoe bat, common pipistrelle and soprano pipistrelle.

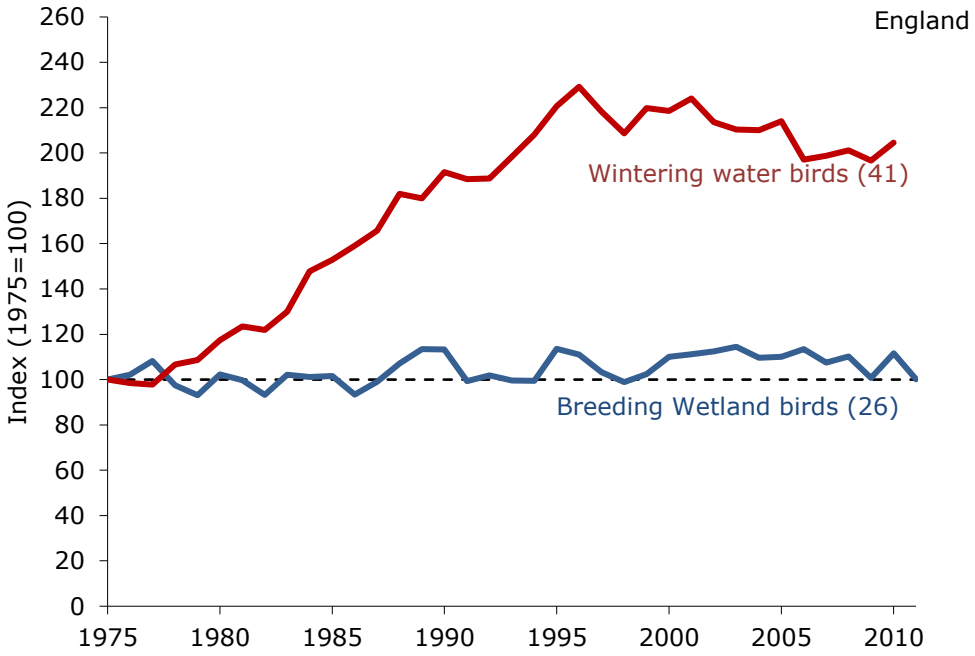
- Between 1970 and 2010, farmland bird numbers fell by 52 per cent. Most of the decline occurred between the late 1970s and early 1990s, but there has also been a decline of nine per cent overall since 2000.
- The longer term decline in bird species has been driven by changes in agricultural practices, including changes in cropping regimes, weed and pest management and historical loss of extensive pasture and semi-natural habitat. The reasons for the more recent decline in bird populations are less well understood and are likely to relate to multiple factors including some farmland management practices, weather events and disease.

- Butterfly numbers on farmland fell to their historical low point in 2008. There has been some recovery, with wide fluctuations from year to year, but the overall change since 2000 is ‘deteriorating’. Butterfly recording is largely based on patches of semi-natural habitat within the agricultural landscape, although there are transects on more intensively managed farmland. The observed trends should therefore be seen as trends on these less intensively managed areas within the wider landscape.
- Since 2000, widespread bat populations in England have increased by 18 per cent. A significant increase in the lesser horseshoe bat population underpins this positive trend and, although the reasons for this increase are not certain, it is thought to be a response to more effective conservation measures and a series of mild winters that have enhanced winter survival.

1b) Populations of wetland birds

The indicator shows changes in abundance of wetland bird species. It presents changes in the population size of 26 breeding wetland birds and 40 wintering water birds, including wildfowl and waders.

Figure 1.2 Trends in populations of breeding wetland birds in England, 1975 to 2011



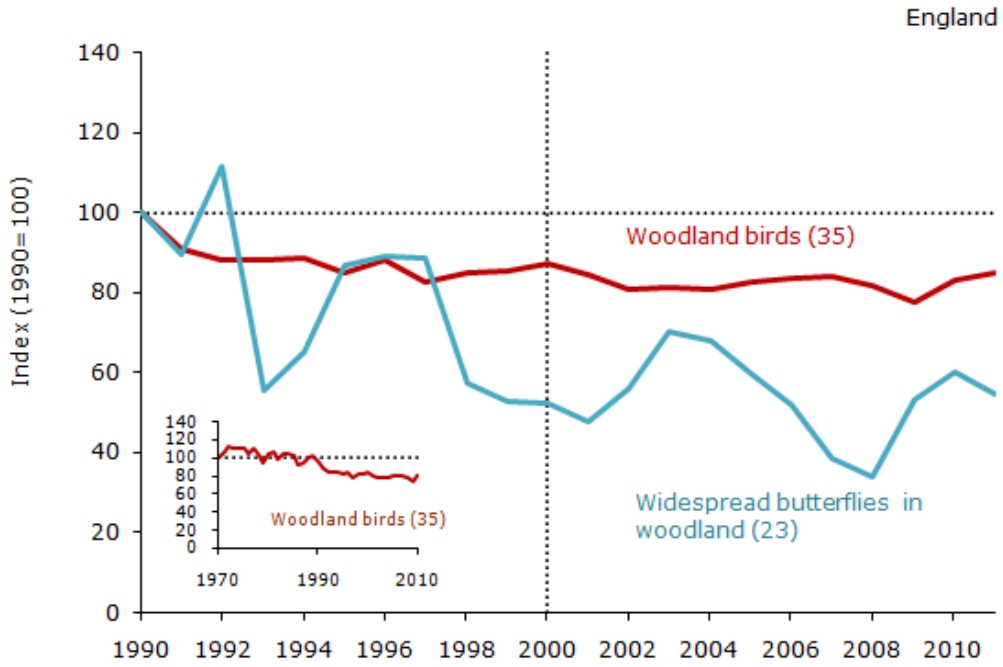
Source: BTO, Defra, JNCC, RSPB and WWT.
Notes:
1. Figures in brackets show the number of species in each measure.
2. Wintering water birds and waders are recorded over winter and have been assigned to the year at the start of the wintering period, for example 2009-10 data have been allocated to 2009.

- Between 1975 and 2010, populations of breeding wetland birds fluctuated from year to year but have remained broadly stable, increasing by just two per cent over the period. This trend masks individual species decline, such as the lapwing which has declined by 43 per cent since its peak in population in 1986. This decline is offset by increases in birds of lakes and large rivers, such as the mallard.
- In the winter of 2009-10, populations of wintering water birds were 85 per cent higher than their 1975-6 level although have decreased by 10 per cent since 2000.
- The increase in wintering water bird populations is not certain but is thought to be due to improved protection of birds internationally and better regulation of hunting these birds. The more recent decline in wintering water bird populations is linked to mild winters meaning that some species, such as European white fronted geese and Purple sandpipers, have overwintered to the north and east of England in countries with cooler climates. Although in other cases of wintering water bird population decline, such as the Bewick's swan, genuine flyway-wide declines appear to have occurred.

1c) Populations of woodland birds and butterflies

The indicator shows changes in abundance of species in woodland based on changes in the population size of 35 widespread breeding birds and 23 widespread butterflies, recorded in woodland habitats.

Figure 1.3 Populations of widespread breeding birds and butterflies in woodland, 1990 to 2011



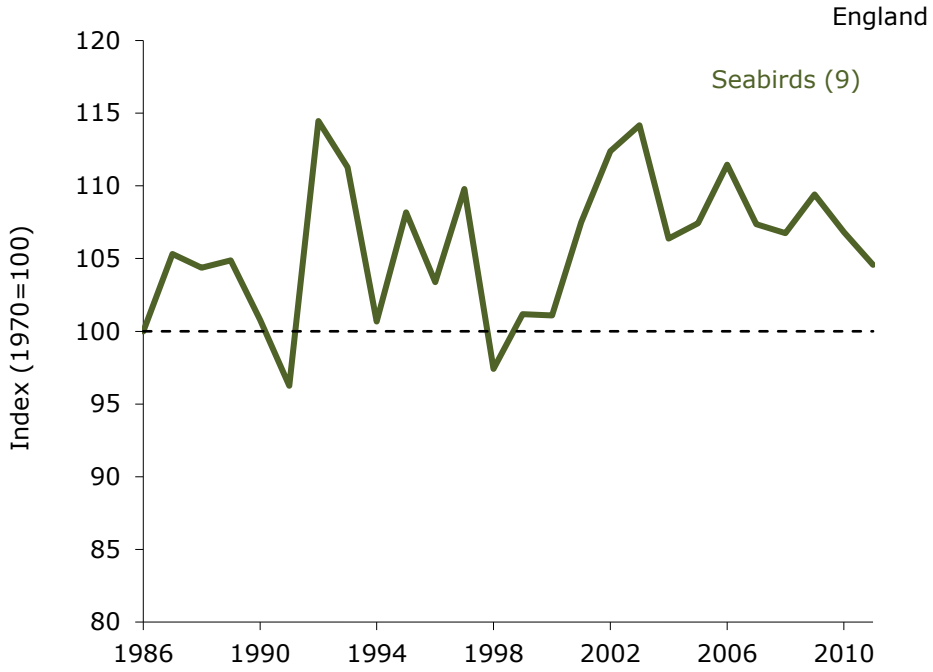
Source: BTO, BC, CEH, Defra, JNCC and RSPB.
Note: Figures in brackets indicate the number of species in each measure.

- In 2010, breeding woodland birds populations were about 20 per cent lower than their 1970 level. The greatest decline in woodland birds occurred from the late eighties until the mid nineties and the index has been relatively stable since 2000.
- The declines in woodland birds have several known and potential causes including a lack of management and increased deer browsing pressure, both of which result in a reduced diversity of woodland structure and, therefore, reduced availability of suitable nesting and foraging habitats. In addition, several declining woodland birds are long-distance migrants, and a decline in the extent or quality of habitats used outside the breeding season and climate change may be affecting these species.
- Butterfly numbers on woodland fell to their historical low point in 2008. Since then there has been a modest increase, although numbers fell again in 2011. Overall, between 1990 and 2011 there has been a 45 per cent decrease in the population of 45 butterflies of the wider countryside. Lack of appropriate woodland management is also thought to be a factor in the decline of some woodland butterflies.

1d) Populations of seabirds

Data on seabirds may reflect broad biodiversity changes in coastal areas and the marine environment. This indicator shows changes in the abundance of nine breeding seabirds around England's coast.

Figure 1.4 Population trend of seabirds, 1986 to 2011



Source: BTO, RSPB, JNCC, Defra.
Notes: Figures in bracket show the number included in the measure.

- There was little or no overall change in the size of populations of seabirds between 1986 and 2010. In 2010, populations of seabirds were three per cent higher than the level in 1986 although because of the high degree of variation from year to year, this change is not considered significant.
- Species have had mixed fortunes; for example, Kittiwakes declined by 31 per cent between 1986 and 2011, whereas Guillemots increased by 132 per cent over the same period.
- The recent declines in some species such as Kittiwake is known to be linked with food shortages during the breeding season, and although it is not clear what is ultimately driving this, fishing practice and climate change, or some combination of the two, are likely contributory factors.

Indicator Assessment

Assessment of change in abundance and diversity of species in the wider countryside			
	Long term	**Since 2000**	**Latest year**
Breeding farmland birds	1970-2011		Increased (2011)
Butterflies of the wider countryside on farmland	1990-2011		Decreased (2011)
Widespread bats	1978-1992		Decreased (2011)
Breeding wetland birds	1975-2011		Decreased (2011)
Wintering water birds	1975-6 to 2010-11		Increased(2010-11)
Breeding woodland birds	1970-2011		Increased (2011)
Butterflies of the wider countryside in woodland	1990-2010		Decreased (2011)
Breeding seabirds	1986-2011		Decreased (2011)

Links

Organisation	Subject
Defra	England Biodiversity Indicators
Defra	Wild Bird Statistics: England
UK Butterfly Monitoring Scheme	Home Page
Bat Conservation Trust	National Bat Monitoring Programme
Forestry Commission	Indicators

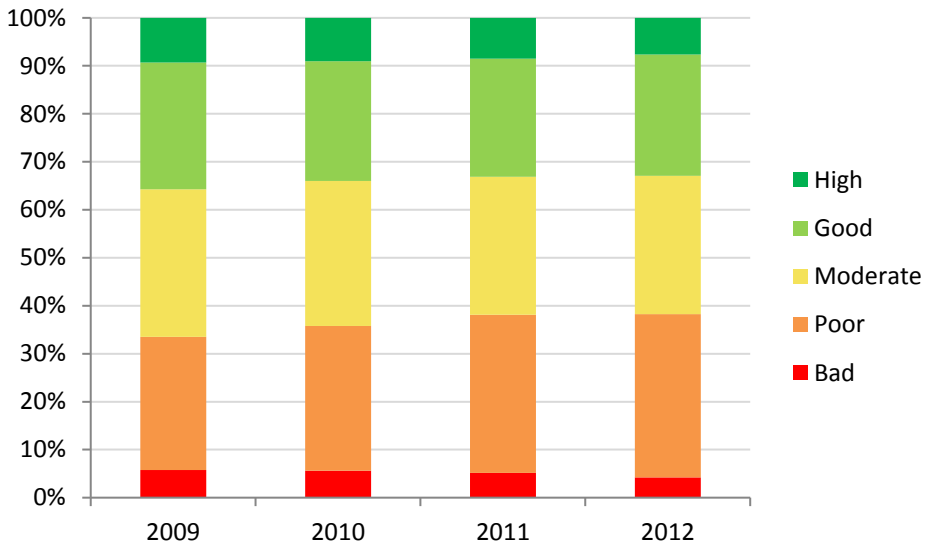
2. Water Quality

This indicator relates to the ambition to improve all areas of the natural environment, including the water environment. This indicator may be amended in future to align more closely with the equivalent indicator in the UK and England Biodiversity Indicator publication, which is still in development.

2a) Biological quality of rivers

The indicator shows the biological quality of rivers using data from the Water Framework Directive assessment of water body status. Rivers are assessed as being in 'high', 'good', 'moderate', 'poor' or 'bad' status through a moving 3 yearly monitoring programme.

Figure 2.1 The biological quality of rivers in England, 2009 to 2012



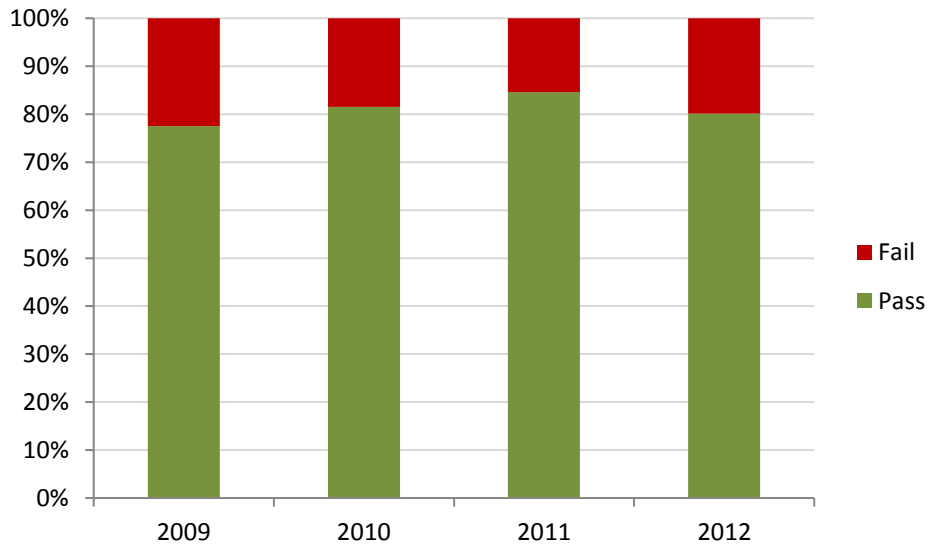
Source: Environment Agency

- The proportion of rivers at good or high biological quality has shown no significant change between 2009 and 2012.
- Between 2009 and 2012 the number of assessments classed as high fell from 304 to 253 and the number of assessments classed as bad fell from 189 to 139. This suggests that there has been a mix of deteriorations and improvements in the biological quality of the water environment.
- Changes in water quality can happen for a number of reasons; while some of the differences between years will be due to measurement issues and monitoring locations, factors such as the climate and extreme weather events can also have an impact.

2b) Chemical status of rivers

This indicator shows the chemical status of rivers using data from the Water Framework Directive assessment of water body status. Chemical status is assessed from compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances. A list of priority substances can be found in the Chemical Standards database on the Environment Agency's website. Chemical status is recorded as 'pass' or 'fail' and is determined by the worst scoring chemical, so if one chemical fails the river is given a failing status.

Figure 2.2 The chemical status of rivers in England, 2009 to 2012



Source: Environment Agency

- The number of assessed rivers that have passed the chemical status criteria has increased from 411 in 2009 to 431 in 2012 suggesting that less chemical pollution is being observed in rivers.
- Rivers are generally monitored for priority substances where there are known discharges of these pollutants. Rivers without discharges of priority substances are reported as being at good chemical status.

Indicator Assessment

Assessment of change in Water Quality			
	Long term	**Last 10 years**	**Latest year**
Proportion of rivers with biological quality classed as good or high		 since 2009	No Change (2012)
Proportion of rivers which pass on chemical status		 since 2009	Decreased (2012)

Links

Organisation	**Subject**
Environment Agency	Water Framework Directive
Environment Agency	Chemical Standards Database
Defra	England Biodiversity Indicators

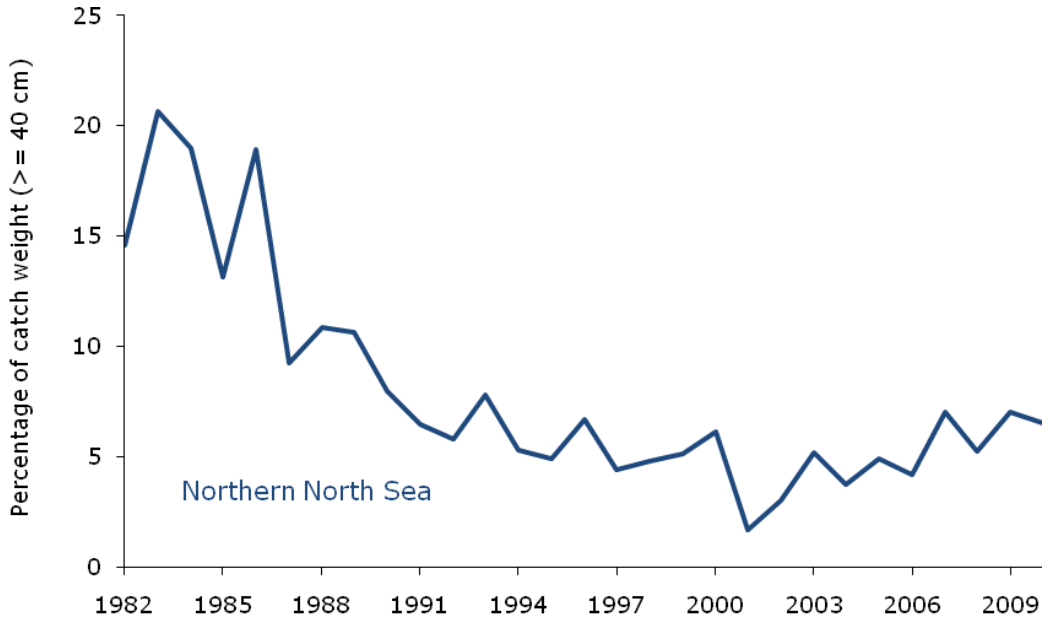
3. Marine Ecosystem Integrity

An important part of the NEWP is to safeguard the multi-functional use of different ecosystems and habitats. Protecting and improving the marine environment is an essential aspect of this.

3 a) Size of fish in the North Sea

The indicator shows changes in the proportion, by weight, of large individuals equal to or over 40cm in length in fish populations in the northern part of the North Sea, from the Humber Estuary to the Shetland Islands. Changes in the size structure of fish populations reflect changes in the health of the fish community, with a higher proportion of fish being larger than 40cm signifying a healthier marine environment.

Figure 3.1 Proportion of large fish (equal to or larger than 40cm), by weight, in the Northern North Sea, 1982 to 2010



Source: Marine Scotland, CEFAS.

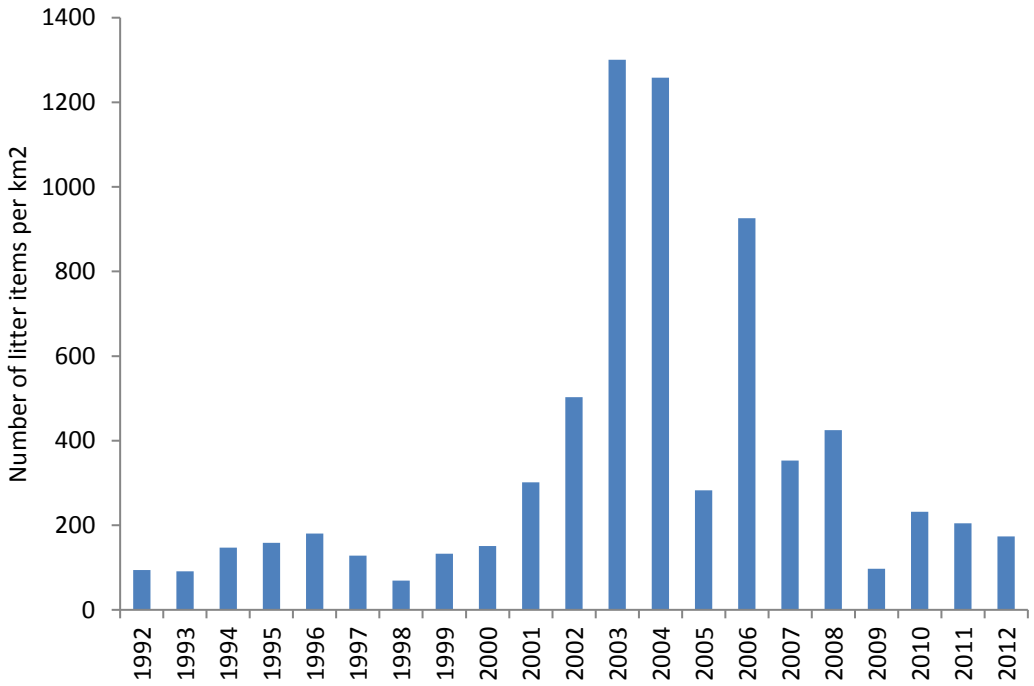
- The proportion of large fish declined most rapidly from the mid-1980s to the mid-1990s.There is a strong suggestion that the proportion has increased since 2000, but this change is not significant (and is therefore assessed as showing little or no overall change since 2000).
- The broad pattern of general decline followed by a more recent period of stabilisation and possible increase in the Northern North Sea is repeated in other seas around the UK.

3b) Marine Litter

This indicator shows the number of litter items per square kilometre on the sea floor around the UK. The government's Marine Strategy Framework Directive Descriptor 10 aims that "properties and quantities of marine litter do not cause harm to the coastal and marine environment". Over the past ten years several marine litter regulations and legislation have come into force. These include UN General Assembly resolution, Water and Marine Strategy Framework Directive, the revised MARPOL Annex V and Port Waste Reception Facilities Regulations.

The MSFD descriptor will be measured by 3 indicators; beach litter, litter found on the sea floor and litter recorded in the stomachs of Northern fulmars. The indicator presented below focuses on the changes in sea floor litter.

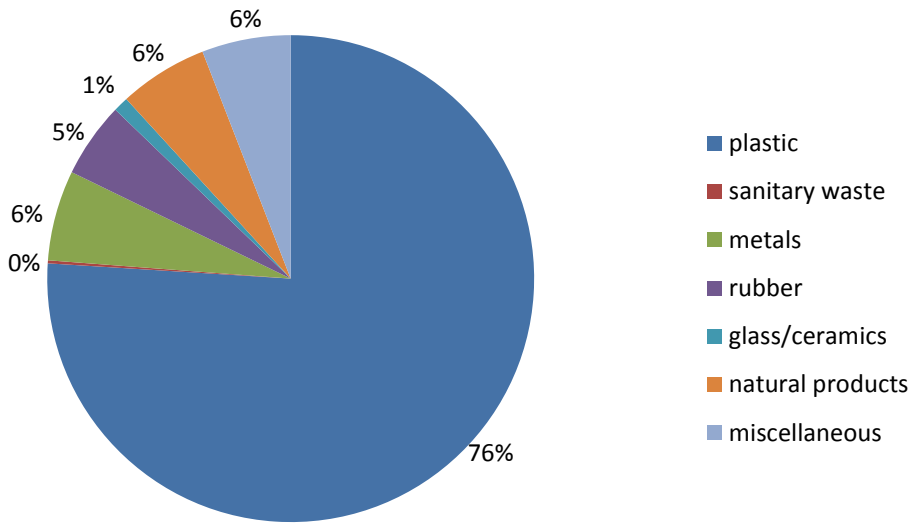
Figure 3.2 Average number of litter items per km^2 on the sea floor taken from sample sites around UK waters, 1992 to 2012



Source: CEFAS (© Crown copyright 2013: permission granted by Thomas Maes, CEFAS)

A breakdown of the composition of litter can be seen in figure 3.3.

Figure 3.3 **Overall marine litter composition from the sea floor in UK waters, 1992 to 2012**



Source: CEFAS (© Crown copyright 2013: permission granted by Thomas Maes, CEFAS)
Notes: Sanitary waste was only collected from 2010

- The number of items of litter on the sea floor per km^2 has varied greatly between 1992 and 2012. The marked increases in 2003, 2004 and 2006 could be a delayed effect of improvements in the monitoring programme or actual effects of prevailing weather. Alternating dry conditions and extreme rainfall dominated from 2001 to 2007, which could have had an effect on the amount of litter transported to the sea.
- Sea floor litter is dominated by plastics, which made up 76 per cent of all sea floor litter as shown in figure 3.3.

Indicator Assessment

Assessment of change in Marine Ecosystem Integrity measures			
	Long term	**Since 2000**	**Latest year**
Fish size class	1982-2010	≈	Declined (2010)
		Past 10 years	
Marine Litter[2]	1992-2012	✓	Declined (2012)

Links

Organisation	Subject
Defra	Charting Progress: The State of UK Seas
Defra	Marine Strategy Framework Directive
Wageningenur UR	Fulmar Research
Marine Conservation Society	Big Beach Clean
CEFAS	Home page

[2] The indicator assessment for marine litter should be treated with caution as it is very difficult to establish trends for this measure.

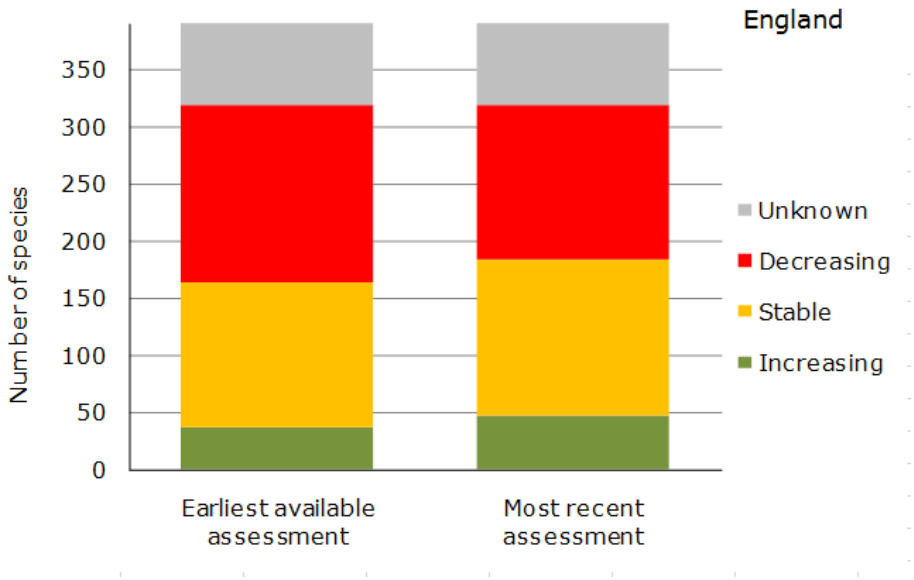
4. Priority Species and Habitats

This indicator relates to the ambition to protect and improve the biodiversity in England.

4a) Status of priority species

Priority species are a focus for conservation action in England. The indicator shows changes in the status of priority species in England assessed between 2002 and 2008. It is based on the change in the status of 390 species for which a status assessment is available in at least one of the recording years. This is an interim indicator and will be modified in line with the measure in the Biodiversity 2020 indicator set, which will be updated in October 2013.

Figure 4.1 Change in the status of priority species, 2002 to 2008



Source: UK Biodiversity Partnership, NE, JNCC.

Notes:

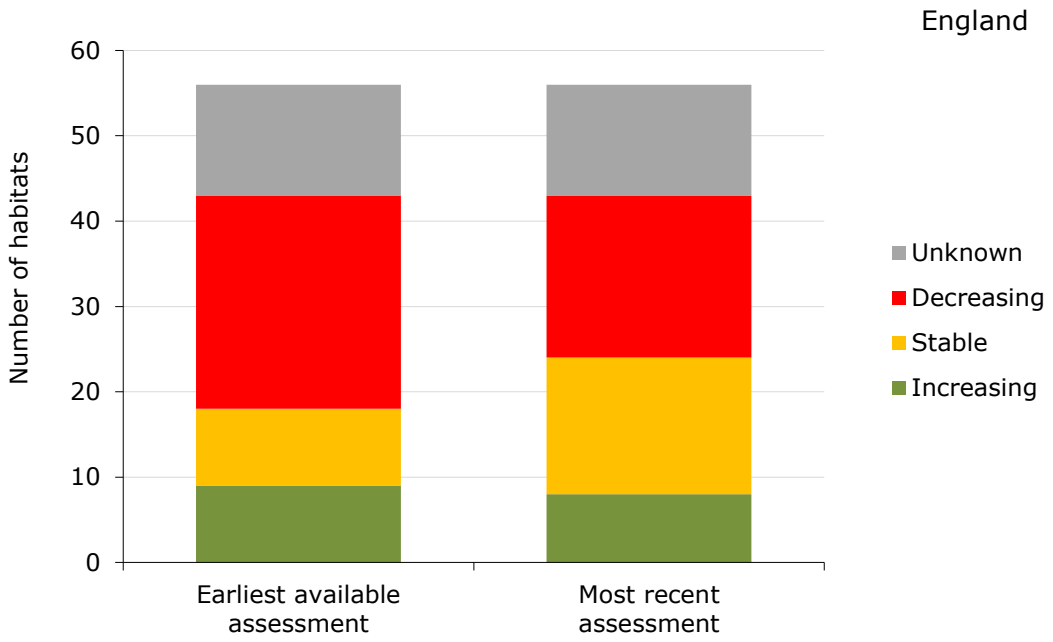
1. Priority species presented are those under the UK BAP
2. 'Decreasing' includes species assessed either as declining or lost.
3. Based on 390 priority species or grouped priority species.

- There are 943 'priority' species of principal importance for the conservation of biological diversity in England under section 41 of the Natural Environment and Rural Communities Act 2006. This list is based on priority species formerly listed in the in the UK Biodiversity Action Plan (UK BAP).
- The indicator assessment is based on the change in the status of 318 (out of a total of 390 species) for which a status assessment is available in at least one of the recording years between 2002 and 2008.
- Of the 318 species, 183 were recorded as stable or increasing in the most recent assessments, compared with 163 in their earliest assessment, representing a 12 per cent increase. Despite this small improvement, in 2008 almost 30 per cent of the UK priority species were still declining in England and a small number had been lost.

4b) Status of priority habitats

Priority habitats are a focus for conservation action in England. The indicator shows changes in the status of priority habitats in England as assessed by Natural England between 2002 and 2010. The indicator assessment is based on the change in the status of 56 habitats for which a status assessment is available in at least one of the recording years. This is an interim indicator and will be updated in line with the measure in the Biodiversity 2020 indicator set.

Figure 4.2 Change in the status of priority habitats, 2002 to 2010



Source: UK Biodiversity Partnership, NE, JNCC

Notes:

1. Priority habitats presented are those under the UK BAP
2. Of the known earliest available assessments, 27 were made in 2002, 5 in 2005, 5 in 2008 and 6 in 2010.
3. Of the known most recent assessments 27 were made in 2010, 15 in 2008 and one in 2005.
4. Of the 13 unknown, 2 were assessed and status determined as unknown while 11 have not been assessed.

- Priority habitats are a focus for conservation action in England. There are 56 habitats recognised as of 'principal importance' for the conservation of biological diversity in England under section 41 of the Natural Environment and Rural Communities Act 2006.
- Status information for 43 of the 56 priority habitats was available in at least one of the recording years between 2002 and 2010. Of the 56 priority habitats, 24 were recorded as stable or increasing in the most recent assessment, an improvement on the 18 in their earliest assessment.
- Despite this improvement, in 2010, 19 priority habitats were assessed as still declining in their total area covered.

Indicator Assessment

Assessment of change in status of priority species and habitats			
	Long term	**Since 2000**	**Latest year**
Number of priority species that are stable or increasing	⋯	✓ 2002	Not assessed
Number of priority habitats that are stable or increasing	⋯	✓ 2002	Not assessed

Links

Organisation	Subject
Defra	England Biodiversity Indicators
UK BARS	UK Biodiversity Action Reporting System

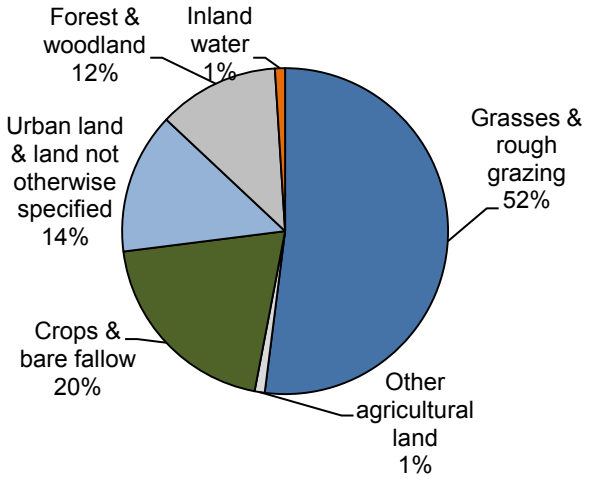
5. Land Use

This indicator relates to the ambition in NEWP that increased pressure on land use needs to be taken into account in the management of land for all its uses, including crops, grazing, forests and built up urban areas.

5a) Land Use by Type

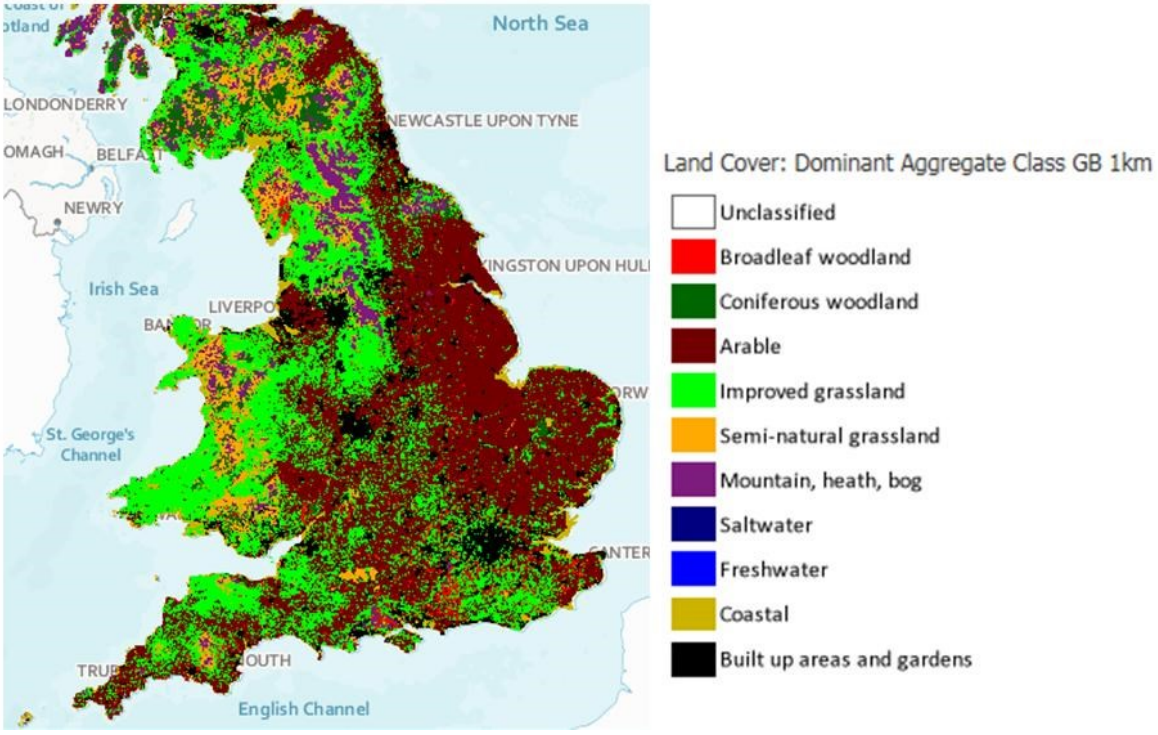
This measure is for context and will not be assessed.

Figure 5.1 Breakdown of land use in the UK (for context), 2009



Source: Defra, OS, FC, Forest Service (Northern Ireland)

Figure 5.2 Map of UK land cover, 2007



Source: CEH

5b) Development on previously developed/undeveloped land

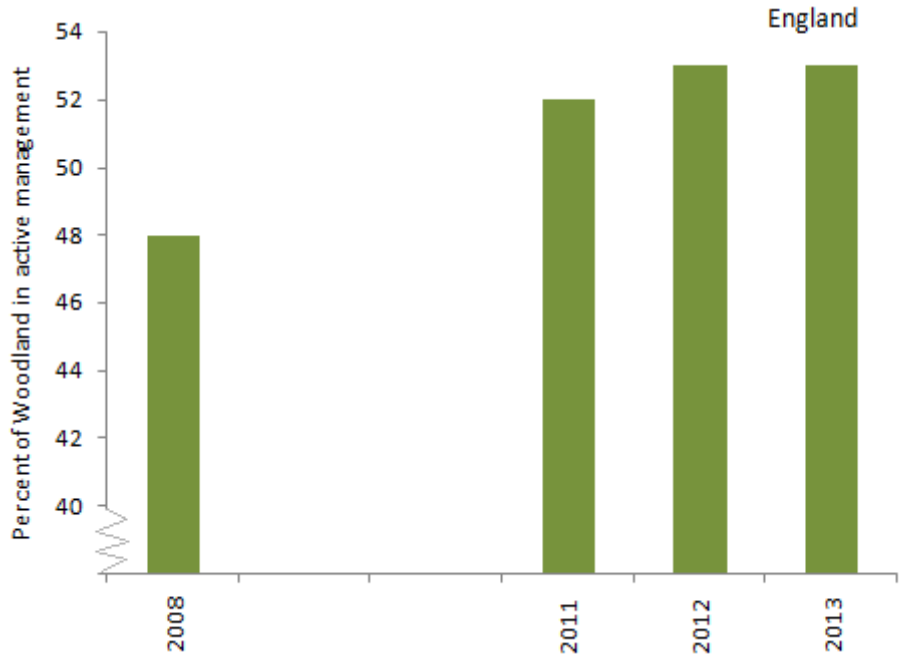
TO BE DEVELOPED

Sustainable use of land is important to deliver development as well as protecting the natural (and historic) environment. This indicator is likely to be based on land use change statistics from the Department for Communities and Local Government. It will be consistent with the indicator presented in the Sustainable Development Indicator set, to be published in summer 2013. It is therefore still in development.

5c) Percentage of woodland in active management

This indicator relates to the NEWP ambition that concerted action will be taken to sustainably manage our woodland environments. This links with the ambition to increase the amount of actively managed woodland set out in the Government Forestry and Woodlands Policy Statement - January 2013. The indicator below is from the Forestry Commission England Corporate Plan Performance and Woodland Indicators. Sustainable harvesting of wood products delivers multiple benefits to society. For example, wood products support economic growth particularly amongst small and medium sized enterprises and management has benefits for biodiversity, managing flood risk and the resilience of the woodlands themselves.

Figure 5.3 Percentage of woodland in active management (including the public forest estate), 2008 to 2013



Source: Forestry Commission
Notes:

1. This indicator defines woodland in management as mainly that included in most English Woodland Grant Schemes or with recent Felling Licence activity. It is recognised that other woodland might be considered as 'managed. Woodland is defined as for the National Forest Inventory.
2. Figures are based on a snapshot from 31st march to 1st April of that year.

- The percentage of woodland in active management has gradually increased by 5 percentage points since 2008 and is currently at 53 per cent.
- There has been a slight increase in the area of woodland in active management in the last 2 years of one percentage point.

Indicator Assessment

Assessment of change of land use			
	Long term	**Past 4 years**	**Latest year**
Land Use	Not assessed		
Change in developed land	To be developed		
Percentage of woodland in active management		 2008	No change (2013)

Links

Organisation	Subject
DCLG	Planning System
DCLG	Land Use Change Statistics
Forestry Commission	Indicator Statistics
Defra	Government Forestry and Woodland Policy Statement

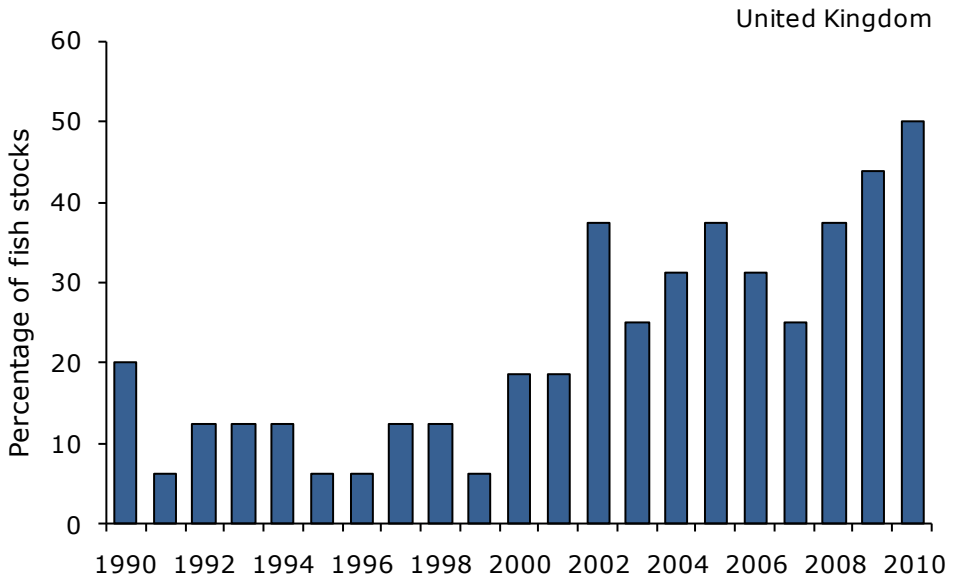
6. Natural Stocks

An important part of the NEWP is to raise awareness of the importance of safeguarding natural stocks both to protect the natural environment and to grow a green economy.

6a) Fish stocks harvested within safe limits

This indicator shows the percentage of fish stocks in seas around the UK that are harvested sustainably and are at full reproductive capacity. This is based on a group of 8 species in 16 stocks for which there are reliable estimates of fishing mortality and spawning biomass and which together represent fish stocks of major importance to the UK fishing industry.

Figure 6.1 Percentage of fish stocks harvested sustainably and at full reproductive capacity in the UK, 1990 to 2010



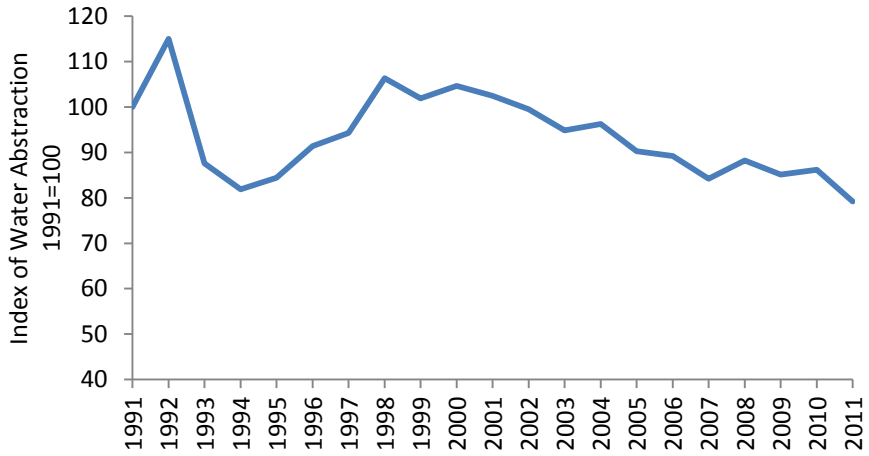
Source: ICES, CEFAS

- The proportion of assessed fish stocks harvested sustainably and at full reproductive capacity varied between 6 and 13 per cent in the period 1991 to 1999, before increasing to 20 per cent in 2000 and 50 per cent in 2010. The highest proportions were in 2009 and 2010.
- Despite this improvement over time, the majority of UK fish stocks have either been below full reproductive capacity or have been harvested unsustainably each year between 2001 and 2008.

6b) Water Abstraction

This indicator shows the abstractions from non-tidal surface waters and groundwater by use. Water is a vital resource that needs to be managed carefully to ensure both that people have access to affordable and safe drinking water and sanitation and that industry needs are met, without depleting water resources or damaging ecosystems.

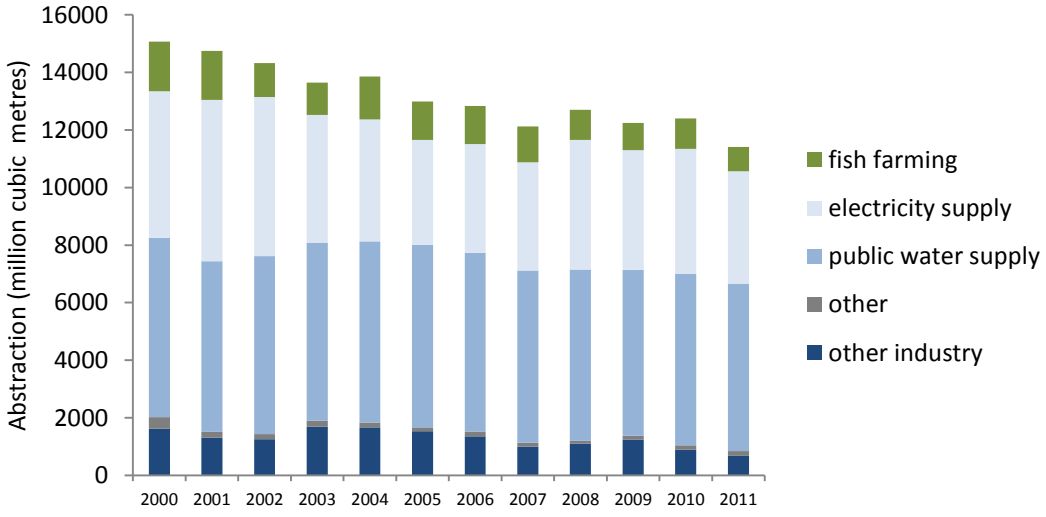
Figure 6.2 Abstractions from non-tidal surface water and groundwater: England and Wales, 1991 to 2011



Source: Environment Agency

- The consumption of water abstracted from non-tidal surface and groundwater in England and Wales has fallen from an estimated peak of 16.5 billion cubic metres in 1992 to an estimated 11.0 billion cubic metres in 2011. As abstractions fall more water should be available for ecosystems in the natural environment.
- Of the 11.0 billion cubic metres abstracted from non-tidal surface water and groundwater in 2011, 51 per cent was for the public water supply and 34 per cent for the electricity supply industry. See figure 6.3 for a detailed breakdown of use.

Figure 6.3 Abstractions from non-tidal surface water and groundwater by use: England and Wales, 2000 to 2011

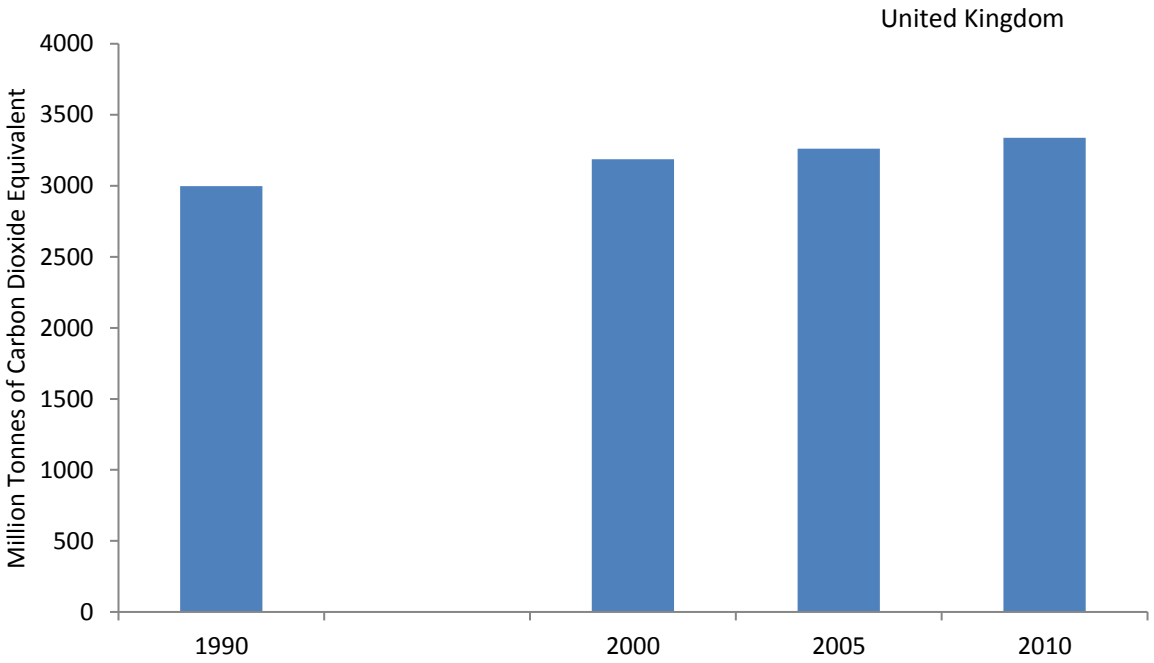


Source: Environment Agency

6c) Forest Carbon Stock

Carbon capture is a regulating function of forests and is important in reducing the impacts of climate change. This indicator shows the tonnage of carbon in UK forests.

Figure 6.4 Total carbon in UK forests, 1990 to 2010



Source: Forestry Commission
Notes: To convert to carbon multiply by 12/44.

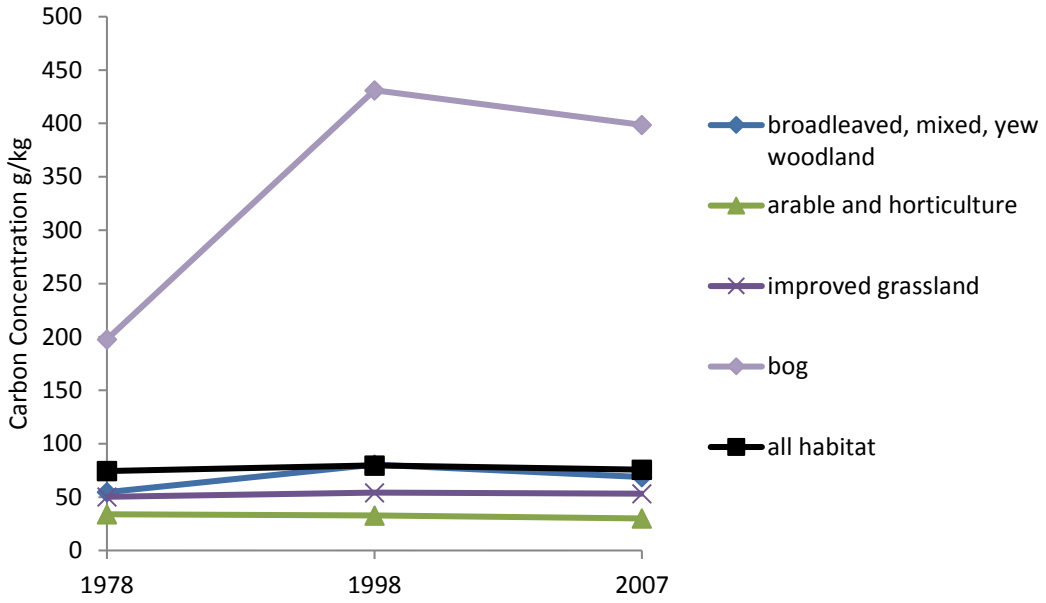
- The total carbon stock in UK forests increased by 10 per cent from 1990 to 2010.
- The carbon in forest soils (depth up to one metre) accounts for approximately 75 per cent of total forest carbon. The remaining 25 per cent consists of carbon in dead wood, carbon in biomass and carbon in forest litter.
- Evidence suggests that most of the increase in soil carbon is existing soil carbon in areas afforested between these dates, not additional carbon sequestered. This means that additional carbon is not being stored in sites where afforestation has taken place as the carbon was already present in the soil.

6d) Soil Carbon Concentrations

This indicator shows the concentration of carbon in soils (0-15cm) in England and is relevant because of the range of ecosystems provided by soil organic matter. Soil organic matter delivers a large number of important benefits to soil (for example improved structure, nutrients, source of food for soil organisms) and its delivery of ecosystem services.

When converted to a carbon stock this can be used together with the forest carbon stock measure to assess how much carbon is stored in the majority of British habitats.

Figure 6.5 Changes in the carbon concentration of soils (0-15cm) from sampling plots in all habitats in England, 1978 to 2007



Source: Countryside Survey
Notes: Data from selected habitats are shown as examples.

- Carbon is fundamental to soil functioning as it is the primary energy source in soils and has a critical role in maintaining soil structural condition and resilience and water retention. As carbon levels decrease soils become more vulnerable to degradation and are less able to perform vital ecosystem services.
- Soils are the largest terrestrial store of carbon; globally soils contain about twice as much carbon as the atmosphere and about three times the carbon stored in vegetation. Losses of soil carbon contribute to greenhouse gas emissions, in the form of carbon dioxide.
- The assessment for this indicator is based on the all habitat line in figure 6.5. The only decline that is assessed as significant is the arable and horticulture line. The increase in soil carbon in bog habitats is not significant due to changes that occur in the sampling methodology in the Countryside Survey.

Indicator Assessment

Assessment of change in Natural Stocks			
	Long term	**Since 2000**	**Latest year**
Sustainable fisheries	✓ 1990-2010	✓	Increased (2010)
Forest Carbon Stock	✓ 1990-2010	✓	Not assessed
		Past 10 years	
Water Abstraction	✓ 1991-2011	✓	Decreased (2011)
Soil Carbon Concentration (all habitats)	≈ 1978-2007	≈ 1998 – 2007	Not assessed

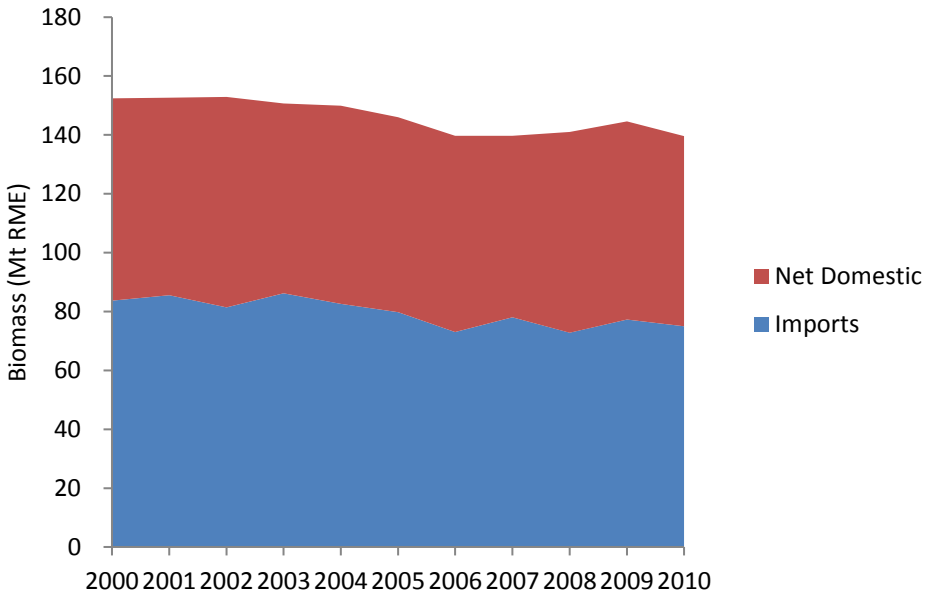
Links

Organisation	**Subject**
Defra	England Biodiversity Statistics
Cefas	Home Page
Forestry Commission	Indicator Statistics
Defra	Government Policy on Forestry
Defra	Water Abstraction Statistics
Countryside Survey	Soils Survey Report 2007

7. Raw Material Consumption

This indicator focuses on the use of renewable materials in our consumption. Biomass is material derived from living or recently living organic matter and is a renewable source of energy and material. It is positive to observe lower overall consumption alongside a move away from the consumption of finite materials to that of biomass, provided that biomass extraction is sustainable. Biomass consumption is measured in terms of its raw material equivalent (RME). The RME of a product indicates how much extraction of material was necessary over the whole production chain for manufacturing that specific product. Total UK consumption equals UK production plus imports minus exports. Net domestic is UK production minus exports.

Figure 7.1 Biomass Consumption per year in million tonnes of raw material equivalent in the UK, 2000-2010

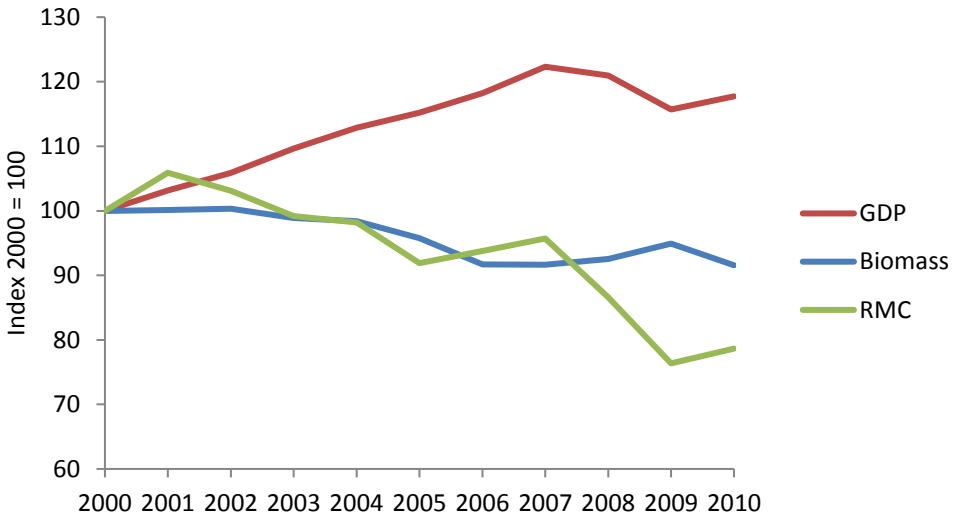


Source: Defra, ONS
Notes: Net Domestic consumption is the consumption in the UK plus imports and minus exports.

- Total biomass consumption has dropped from 152 million tonnes (mt) of RME in 2000 to 140mt RME in 2010. This represents an eight per cent drop in consumption over the last 10 years.
- The proportion of biomass consumption from imports has slightly decreased from 55 per cent to 54 per cent between 2000 and 2010.

It is important to contextually understand the impact of changing consumption. Figure 7.2 shows a comparison of GDP, biomass and raw material consumption (RMC). RMC includes the consumption of biomass, construction materials and minerals.

Figure 7.2 Comparative indices of GDP, biomass and total Raw Material Consumption (RMC) in the UK, 2000-2010



Source: Defra, ONS

- The decline in biomass over the time period shown is slower than that of RMC implying a higher proportion of RMC is now due to biomass consumption.
- The increase in GDP alongside a decrease in RMC over the last 10 years suggests that the reduced consumption may be due to higher resource efficiency.

Indicator Assessment

Assessment of change in Raw Material Consumption			
	Long term	**Past 10 years**	**Latest year**
Raw Material Consumption	2000-2010		Decreased (2010)

Links

Organisation	Subject
ONS	Experimental estimates of resource use

8. Value of Ecosystem Services

TO BE DEVELOPED

This indicator will account for the services that the environment provides which are not priced in the market place; over time we will be trying to measure these in physical and monetary terms so that the value of the environment is fully accounted for.

In the near-term this indicator will be based on forthcoming ecosystems accounts for woodlands. The Office for National Statistics plans to publish initial monetary and physical accounts by autumn 2013. Depending upon the quality and scope of the underlying estimates and the availability of updates, an indicator will be developed which monitors the value of different ecosystems services from woodlands in the UK.

In the longer term, this work will be expanded to cover other habitats including enclosed farmland and semi-natural grassland.

Indicator Assessment

Assessment of change in the Value of Ecosystem Services			
	Long term	**Past 10 years**	**Latest year**
Value of Ecosystem Services	To be developed		

Links

Organisation	Subject
ONS	Environmental Accounts

9. Biodiversity and Natural Environment Considerations in Business Activity

TO BE DEVELOPED

This indicator relates to the NEWP aim of encouraging businesses to use natural capital sustainably and protecting it through day to day operations.

The indicator is under development for the UK Biodiversity Indicators and the measures used for NEWP will take a similar approach on an England scale. A consultative workshop with partners to identify possible options for this indicator took place in March 2013, and will be considered by the UK Biodiversity Indicators Steering group in late spring. The aim is to develop an indicator on 'integrating biodiversity considerations into business decision making' without placing extra burdens on businesses.

Indicator Assessment

Assessment of change in Integrating biodiversity and natural environment considerations into business activity			
	Long term	**Past 10 years**	**Latest year**
Biodiversity and natural environment considered in business activity	To be developed		

Links

Organisation	Subject
Defra	UK Biodiversity Indicators
JNCC	Business considerations

10. Public Engagement with the Natural Environment

This indicator mainly relates to the ambition in NEWP to reconnect people and the environment. It has been shown that nature has a positive impact on a person's well-being and that green spaces enhance communities[3].

10a) Proportion of population visiting the natural environment several times a week

This indicator provides an estimate of the frequency of visits and access to the natural environment by the adult population in England. It is intended to measure how much people engage directly with the natural environment by visiting it regularly. Figure 10.1 shows the proportion of the population reporting that, on average, they visited the outdoors several times a week or more over the previous year.

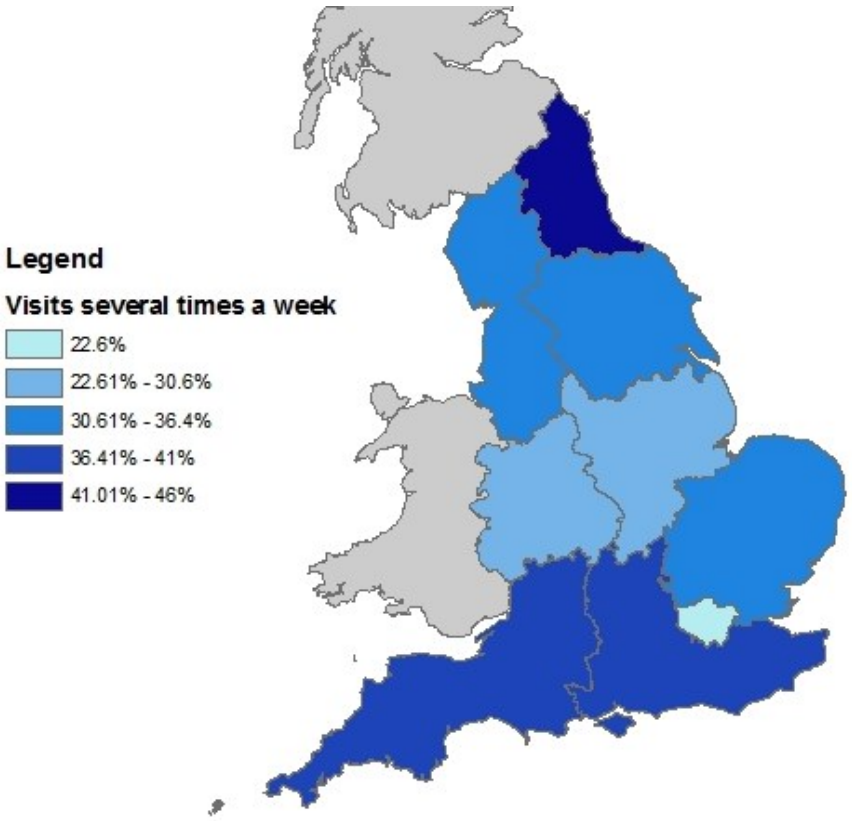
Figure 10.1 Proportion of the population visiting the outdoors several times or more a week in the last 12 months, 2009-10 to 2011-12

Source: MENE

[3] National Ecosystems Assessment, 2011

- The indicator provides an estimate of the frequency of visits and access to the natural environment by the adult population in England.
- Between March 2011 and February 2012 just over a third (34 per cent) of the adult population stated that on average, they had visited the natural environment several times a week or more over the previous year. Twenty one per cent stated they normally visited once a week, eight per cent only visited once or twice and eight per cent claimed not to have visited at all over the previous year. There has been no overall change in the frequency of visits to the outdoors over the three year period. The small increase in 2011-12 is not statistically significant.

Figure 10.2 Proportion of the population visiting the outdoors several times or more a week in the last 12 months, 2011-12



Source: MENE

- The proportion of people who visit the natural environment several times or more a week varies across England.
- In 2011-12 a lower proportion of people living in Greater London visited the natural environment several times a week then the rest of England.

10b) Children's Engagement with the Natural Environment

This indicator shows how many visits to the natural environment were taken by children accompanied by an adult. The NEWP encourages more frequent visits to the natural environment by children as evidence suggests they may then learn to value it from a young age. This indicator may change in future depending on the availability of information regarding visits taken by children to the natural environment unaccompanied by an adult.

Figure 10.3 **Estimated number of visits with more than 1 child in the party, England, 2009-10 to 2011-12**

Source: MENE

- In 2011-12, an estimated 597 million visits with one child or more in the party were taken.
- Despite changes in the overall number of visits made, the proportion of visits including children has remained steady at 22 per cent in the three years since 2009-10.
- Based on an average of 2.06 children per visit, an estimated 1.2 billion children visited the natural environment during 2011-12.
- These figures only include visits were the child was accompanied by an adult. As such this excludes visits taken with friends, school groups or clubs. The estimated number of visits taken by children to the natural environment is therefore likely to be greater than that shown in figure 10.3.

10c) Conservation Volunteering

The indicator shows the amount of volunteer time spent undertaking conservation activities for twelve organisations across the environmental sector in England. The work undertaken by conservation volunteers includes assisting with countryside management, carrying out surveys and inputting data, assisting with administrative tasks, and fundraising. Figure 10.4 shows the relative change in the number of volunteer hours worked from 2000 to 2011 (rather than actual totals).

Figure 10.4 Index of volunteer time spent on the natural environment for selected organisations in England, 2000 to 2011

Source: BCT, BTCV, British Waterways, Exmoor National Park Authority, Lake District National Park Authority, Northumberland National Park Authority, NE, North York Moors National Park Authority, Peak District National Park Authority, RSPB, South Downs National Park Authority, The Wildlife Trusts.

- The indicator shows the amount of volunteer time spent undertaking conservation activities for 12 organisations across the environmental sector in England. The work undertaken includes assisting with countryside management, carrying out surveys and inputting data, assisting with administrative tasks, and fundraising.
- The amount of volunteering time has generally risen since 2000 but has declined since 2008, falling seven per cent between 2010 and 2011. This may reflect changes in volunteering levels at one or two large organisations; for example, the BTCV instigated large youth programs in 2007 which affected the totals for that year.

Indicator Assessment

Assessment of change in Engagement with the Natural Environment			
	Long term	**Past 3 years**	**Latest year**
Proportion of people visiting the natural environment several times or more a week			No change (2010-11)
Number of visits made by children			Increased (2010-11)
Conservation volunteering	 2000-2011		Decreased (2011)

Links

Organisation	**Subject**
Natural England	MENE Survey
National Ecosystems Assessment	Home Page
Defra	England Biodiversity Statistics

11. Ease of Access to Local Woodland, Green Space and Countryside

11a) Ease of access to all green space

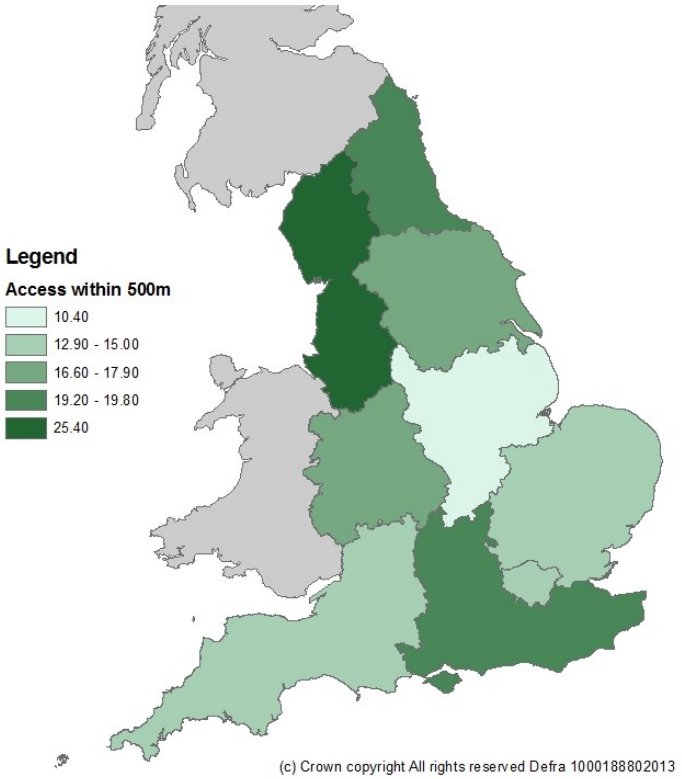
TO BE DEVELOPED

This indicator relates to the ambition in NEWP that everyone should have the opportunity to access a good quality natural environment. The indicator is in development. It is anticipated that the underlying data will be collected via Natural England's Monitor of Engagement with the Natural Environment (MENE) survey which will assess people's views on the availability of the natural environment.

11b) Access to woodland (for context)

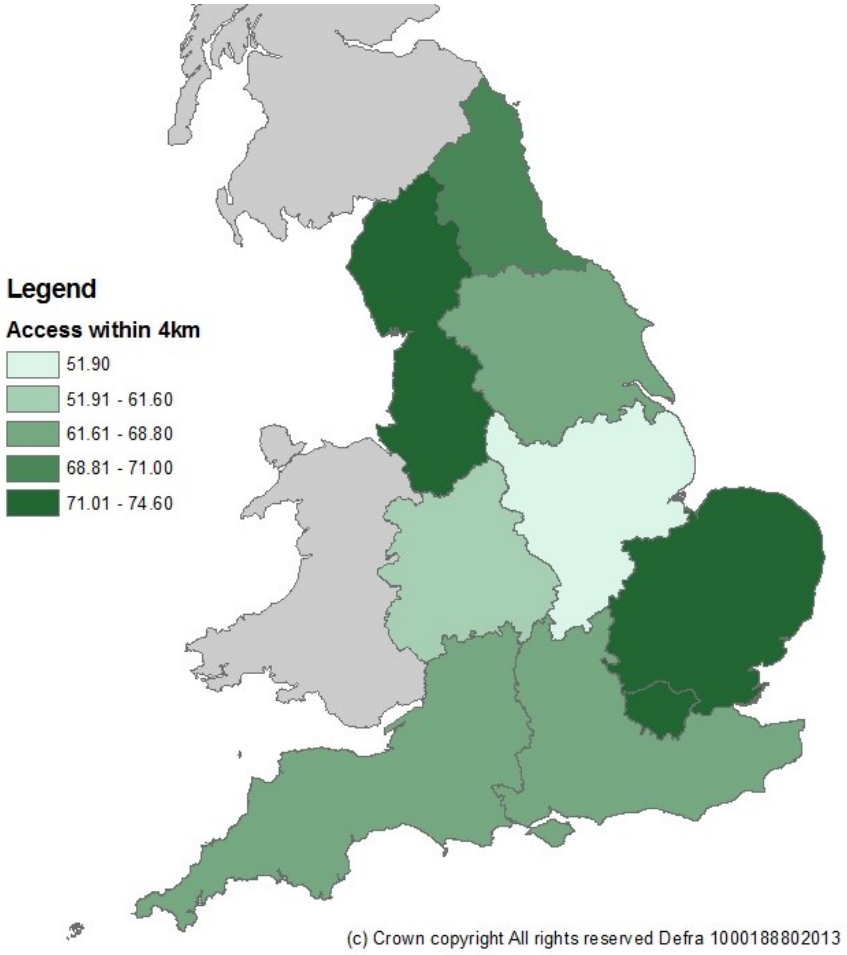
This analysis is based on the Woods for People database which provides a new baseline for the Woodland Access Standard. This sets out the area of both small and large accessible woodlands which should ideally be available within a certain distance from people's homes according to the Woodland Trust's set measures. This measure is presented for context and will contribute to the assessment of indicator 11a when data becomes available.

Figure 11.1 Per cent of population with access to 2ha of woodland within 500m, 2012



Source: Woodland Trust

Figure 11.2 Per cent of population with access to 20ha of woodland within 4km, 2012



Source: Woodland Trust

- In 2012, 17 per cent of the population of England lived within 500m of 2 hectares of accessible woodland and 66 per cent lived within 4km accessible woodland covering more than 20 hectares.
- The regional breakdown for both of these measures is shown in figures 11.1 and 11.2. For smaller areas of accessible woodland (2 hectares or more) the North West had the highest proportion of people living within 500m and the East Midlands the lowest.
- For larger areas of accessible woodland (20 hectares or more) a higher proportion of people living in the North West and East of England lived within 4km. The East Midlands again has the lowest proportion of people living within 4km of large areas of accessible woodland.

Indicator Assessment

Assessment of change in Access to the Natural Environment			
	Long term	**Past 3 years**	**Latest year**
Ease of access to all green space	To be developed		

Links

Organisation	Subject
Natural England	MENE Survey
Woodland Trust	Space for People

12. Environmental Quality and Health

This indicator mainly relates to the ambition to reconnect people and the environment. It has been shown that improvements in the environmental quality of an area can improve health and well-being [4].

12a) Number of pollution days

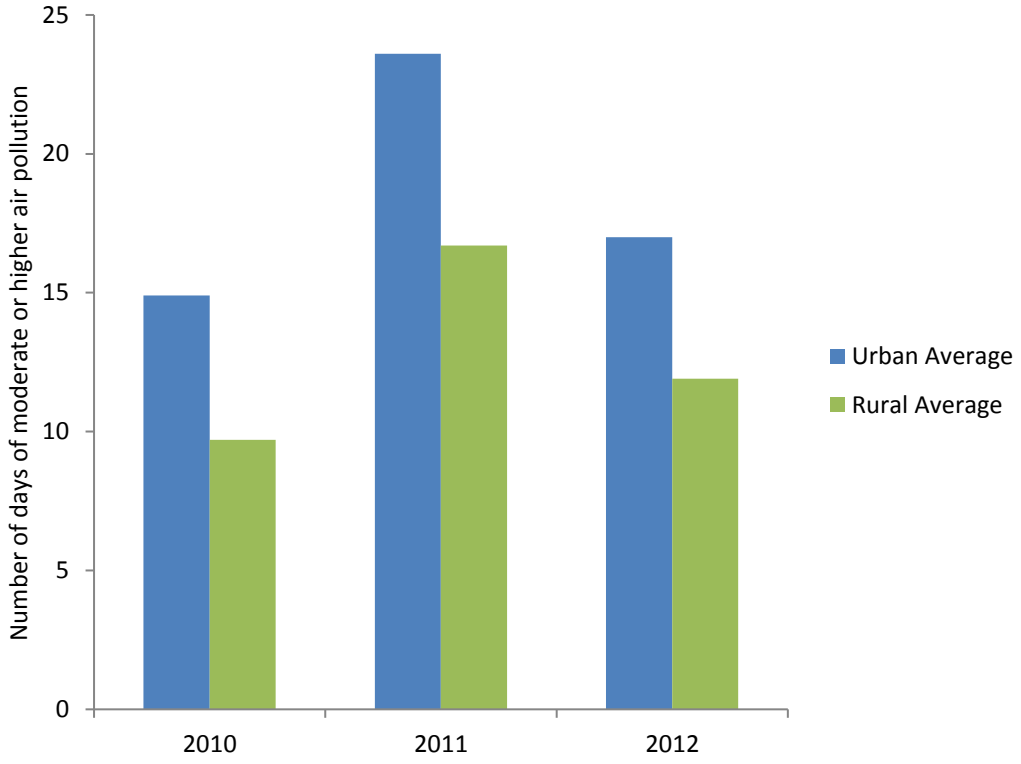
Poor air quality can have effects on health and wellbeing due to both short term and long term exposure. Individuals with existing heart or respiratory conditions are at greater risk of experiencing effects when levels of air pollutants rise. The number of days when air quality is "moderate or higher" is an indicator of how often air pollution is raised to levels when there is an increased risk of health effects from short term exposure.

Monitoring data from Defra's UK network[5] form the basis of this indicator and pollution days are defined using the Daily Air Quality Index (DAQI) banding system[6], [7] recommended by the Committee on Medical Effects of Air Pollutants (COMEAP)[8]. The system uses an index numbered 1-10, divided into four bands (1-3=low, 4-6=moderate, 7-9=high and 10=very high) to provide more detail about air pollution levels in a simple way. The DAQI is determined by the highest concentration of five pollutants – particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide, sulphur dioxide and ozone.

Through improving air quality people will be at less risk from the effects of poor air quality and may be more likely to spend more time in the natural environment. An improvement in air quality would be reflected by a lower number of pollution days in this indicator.

[4] National Ecosystem Assessment 2011
[5] UK-Air Defra
[6] UK- Air, Daily Air Quality Index
[7] Implementation of the Daily Air Quality Index
[8] Health Protection Agency, Review of the UK Air Quality Index 2011

Figure 12.1 Days when air pollution is moderate or higher in the UK, 2010 to 2012



Source: R- AEA Energy & Environment, Defra

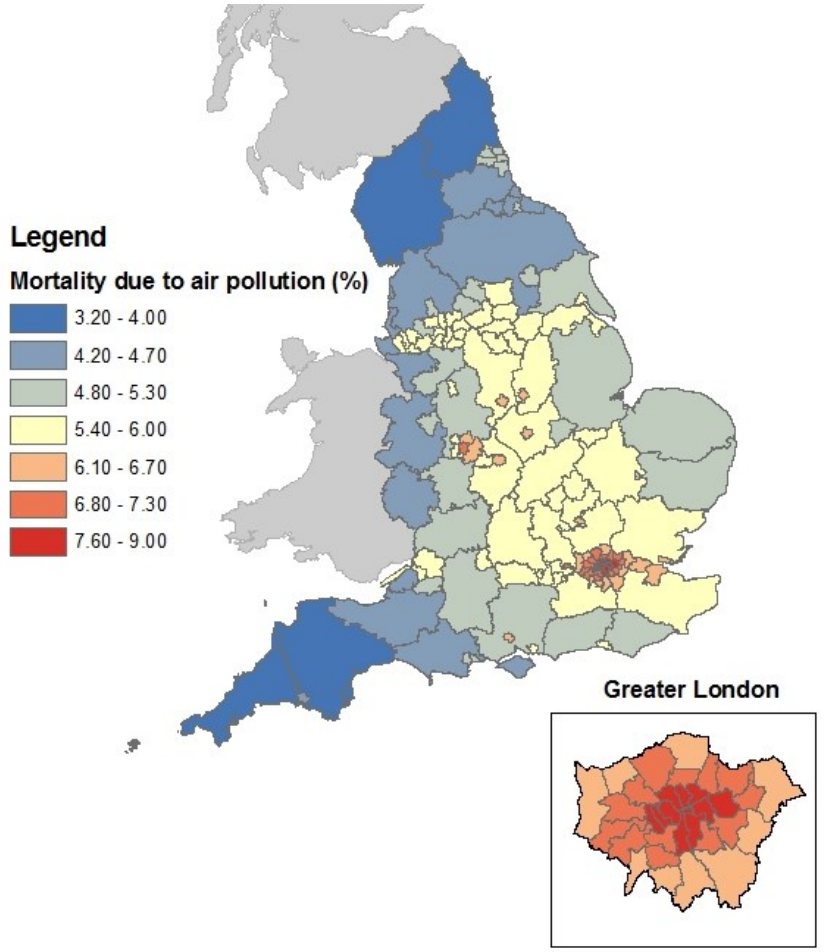
- The average number of pollution days in urban sites in 2012 was 17 days. This compares with 24 days in 2011 and 15 days in 2010. The average number of pollution days in rural sites in 2012 was 12 days, compared with 17 days in 2011 and 10 days in 2010.
- Differences in meteorological conditions can have a strong effect on these figures and therefore more data would be required before any year-on-year trends could be implied.
- These data recently underwent a methodological review and the previous time series, which ran from 1987, is no longer comparable. As a result only three years of data are presented and no trends can be implied. For details of the changes to the method please see the latest statistics release.

12b) Mortality caused by anthropogenic air pollution

Long term exposure to air pollution can have adverse effects on health. In 2008 anthropogenic (human made) particulate matter ($PM_{2.5}$) alone was estimated to have an effect on mortality in the UK equivalent to nearly 29,000 deaths. The Public Health Outcomes Framework Indicator for England[9], a publication of the Department of Health, estimates this long term health burden for different parts of England. Improving air quality can help to reduce this health burden and result in fewer lives lost.

Data for this indicator is only available for 2010; this will be the baseline year of assessment for this indicator. Data are based on Defra's Pollution Climate Mapping modeling[10] of population weighted mean $PM_{2.5}$ concentrations. In 2010, 5.6 per cent of all deaths for over 30-year-olds in England were attributable to long term exposure to current levels of anthropogenic $PM_{2.5}$.

Figure 12.2 Comparison of regional mortality due to air pollution against the England national average in 2010 of 5.6 per cent



Source: PHOF

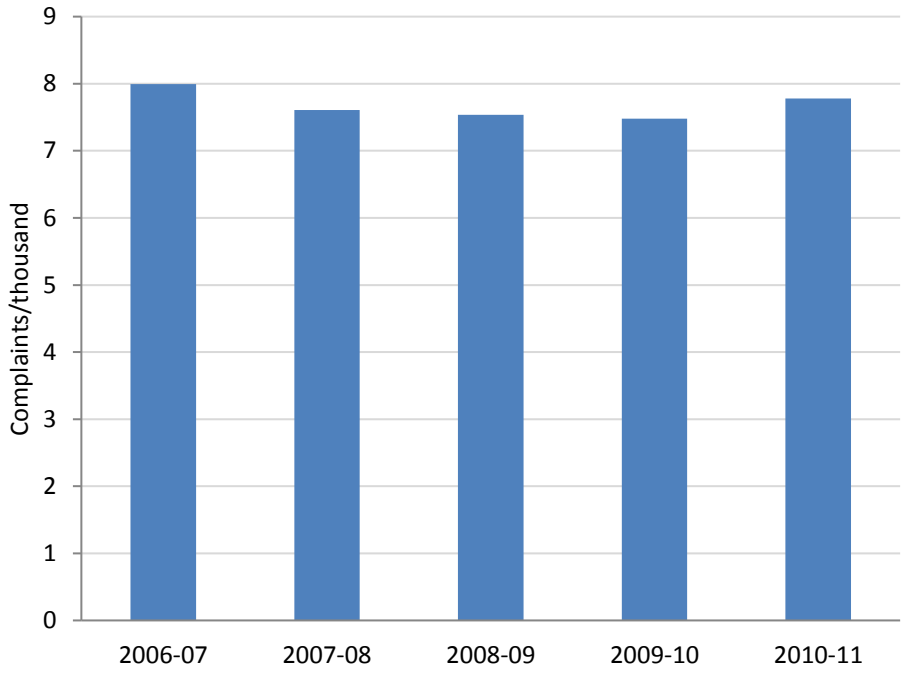
[9] Public Health Outcomes Framework- Air
[10] UK- Air, Defra, Air Quality Modelling

12c) Percentage of the population affected by noise

This indicator features in the Public Health Outcomes Framework for England and is also proposed as a Sustainable Development Indicator. It comprises information about noise complaints and exposure to transport noise.

There are a number of direct and indirect links between exposure to noise and health outcomes such as stress, heart attacks, and other health and wellbeing issues. Complaints about noise are the largest single cause of complaint to most local authorities and there is evidence that exposure to noise is a key determinant of health and wellbeing.

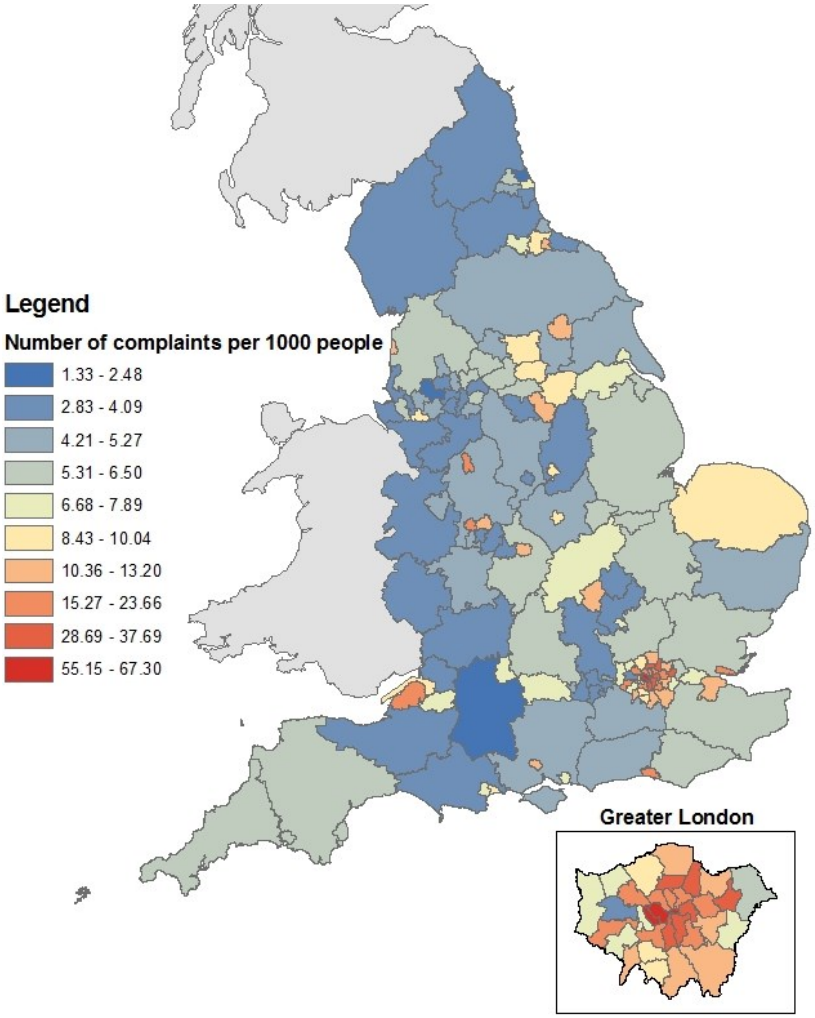
Figure 12.3 Noise complaints per 1000 population in England, 2006-07 to 2010-11



Source: Defra, CIEH

- In 2010-11 there was an average of 7.8 complaints about noise per 1,000 people in England, equivalent to around 1,100 complaints per day.
- While there have been small fluctuations in the year-on-year number of complaints per 1000 population between 2006-07 and 2010-11, there is considerable regional variation. The map in figure 12.4 shows that in 2010-11 the City of London had the highest proportion of complaints with 67 per 1000 population. The area with the fewest complaints per 1000 population in 2010-11 was Wiltshire with 1.3.

Figure 12.4 Comparison of regional noise complaints against the England national average in 2010-11 of 7.84 per 1000 people



Source: CIEH, PHOF

Indicator Assessment

Assessment of change in Environmental Quality and Health			
	Long term	**Past 5 years**	**Latest year**
Number of air pollution days classed as moderate or higher- Urban			Decreased (2012)
Number of air pollution days classed as moderate or higher - Rural			Decreased (2012)
Mortality caused by anthropogenic air pollution			Not yet assessed
Percentage of the population affected by noise			Increased (2010-11)

Links

Organisation	**Subject**
Department of Health	Public Health Framework Outcomes
Defra	Air Quality Statistics
World Health Organisation	Guidelines for community noise

13. International and EU Leadership

There are no suitable outcome-based indicators to monitor progress against the 'International and EU Leadership' ambition. This is because the commitments under this ambition, such as pressing for international implementation of the Nagoya commitments and influencing reform of the Common Agricultural Policy, are not able to be measured through the type of quantitative statistics used for the other indicators in the ENEI set.

For information, this table gives links to existing indicators in this and other publications which have an international element but which are not considered to be closely enough linked to the ambitions of the White Paper to be included as measures of its progress on its international ambition.

Indicator Set	Indicator
England Natural Environment Indicators	Fish stocks harvested sustainably
	Marine Litter
	Raw Material Consumption
Sustainable Development Indicators[11]	Green house gases generated within the UK
	Green house gases generated from UK consumption
	Climate Change Adaptation
	UK CO_2 emissions by sector
	Energy consumed in the UK from renewable sources
	Origins of food consumed in the UK
Biodiversity Indicators	UK Biodiversity Impacts Overseas

On the following page are links to information about various activities being carried out in this area. As this is a statistical publication it is not appropriate to comment on these work areas individually.

[11] The Sustainable Development Indicators are currently being updated so the links shown here are to the previous version of the indicators. Those without links are in still development. The revised SDI publication will be published in summer 2013.

Policy Area	Link
Implementation of the Nagoya biodiversity commitments at home and abroad	https://www.gov.uk/government/policies/protecting-biodiversity-and-ecosystems-at-home-and-abroad
New intergovernmental platform for biodiversity and ecosystem services (IPBES)	http://www.ipbes.net/
	https://www.gov.uk/government/news/biodiversity-new-global-scientific-body-welcomed
Helping developing countries to value their ecosystems, for example, through funding for the Darwin Initiative, WAVES partnership and TEEB	http://darwin.defra.gov.uk/;
	http://www.wavespartnership.org/waves/about-us
	http://www.teebweb.org/
Influencing reform of the Common Agricultural Policy	https://www.gov.uk/government/policies/reforming-the-common-agricultural-policy-to-ensure-a-fair-deal-for-farmers-consumers-and-taxpayers
Influencing reform of the Common Fisheries Policy	https://www.gov.uk/government/policies/reforming-and-managing-marine-fisheries-for-a-prosperous-fishing-industry-and-a-healthy-marine-environment

Annex A – Acronyms

BCT	Bat Conservation Trust
BC	Butterfly Conservation
BTCV	British Trust for Conservation Volunteers
BTO	British Trust for Ornithology
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEH	Centre for Ecology and Hydrology
CIEH	Chartered Institute for Environmental Health
DAQI	Daily Air Quality Index
DCLG	Department for Communities and Local Government
Defra	Department for the Environment, Food and Rural Affairs
EA	Environment Agency
ENEI	England Natural Environment Indicators
EU	European Union
FC	Forestry Commission
GDP	Gross Domestic Product
ICES	International Council for the Exploration of the Sea
JNCC	Joint Nature Conservation Committee
MENE	Monitor of Engagement with the Natural Environment
MSFD	Marine Strategy Framework Directive
NE	Natural England
NEWP	Natural Environment White Paper
ONS	Office for National Statistics
OS	Ordinance Survey
PHOF	Public Health Framework
RMC	Raw Material Consumption
RSPB	Royal Society for the Protection of Birds
SDI	Sustainable Development Indicators
UK BAP	United Kingdom Biodiversity Action Plan
WWT	Wildfowl and Wetlands Trust

Annex B – National Statistics

The following statistics presented in this 2013 update of ENEI are sourced from publications which have been designated as National Statistics:

- Species in the wider countryside: breeding farmland birds
- Species in the wider countryside: breeding woodland birds
- Species in the wider countryside: breeding wetland birds
- Species in the wider countryside: wintering water birds
- Species in the wider countryside: breeding seabirds
- Environmental quality and health: number of air pollution days classed as moderate or higher – urban, and
- Environmental quality and health: number of air pollution days classed as moderate or higher – rural

This means that the UK Statistics Authority, which was given a statutory power to assess statistics against the Code of Practice for Official Statistics in the Statistics and Registration Service Act 2007, has assessed the aforementioned indicators as complying with this code of practice. The code is wide-ranging, but designation can broadly be interpreted as meaning that the statistics meet identified user needs, are well explained and readily accessible, are produced according to sound methods and are managed impartially and objectively in the public interest.

The UK Statistics Authority's assessment of these indicators, alongside other environmental statistics, can be found in its report on Statistics on Sustainability and the Environment in England and the UK (Department for Environment, Food and Rural Affairs), and in the accompanying letter confirming their status as National Statistics.

Designation does not mean that all the individual statistics presented in this publication are National Statistics in their own right; it only relates to the statistics listed above.