Monitoring and evaluating the UK National Adaptation Programme

Natural Environment theme:

- **Ecological condition of:**
  - ***a) Terrestrial habitats: woodlands, heathlands, grasslands***
  - ***b) Wetland habitats: peat bogs, fens, marshes***
  - ***c) Coastal habitats: saltmarsh, mudflats, sand-dunes***
  - ***d) Farmed countryside***
  - ***e) Water bodies: rivers, lakes, estuaries***
  - ***f) Marine environment***
- **Extent of priority habitats**
- **Coherence of ecological networks**

Last updated: 24 June 2015

Introduction

- This slidepack:
  - Serves as a technical annex to **Chapter 6: Natural environment** in the ASC's first statutory report to Parliament on the National Adaptation Programme, available at www.theccc.org.uk/publications
  - Provides the latest trend information on indicators of exposure, vulnerability, action and realised impacts that informed the ASC's assessment. A full list of indicators used by the ASC across all six NAP themes is available at www.theccc.org.uk/publications
  - Will be updated periodically as new data becomes available.
  - Highlights indicators that would be useful but where the necessary datasets have not yet been identified.
  - Follows the structure of the natural environment chapter in the ASC's progress report, which is based on the 'adaptation priorities' the ASC identified for the natural environment.
- After presenting a high level summary of the ASC's assessment of progress against each of the adaptation priorities, this annex sets out the underlying data by adaptation priority.

Natural Environment theme: overview of progress

Adaptation priority	Is there a plan?	Are actions taking place?	Is progress being made?
1. Ecological condition of natural assets:			
1a. Terrestrial habitats and species			
1b. Wetland habitats and species			
1c. Coastal habitats and species			
1d. Rivers, lakes and estuaries			
1e. Farmed countryside			
1f. Marine environment			
2. Extent of priority habitats			
3. Coherence of ecological networks			

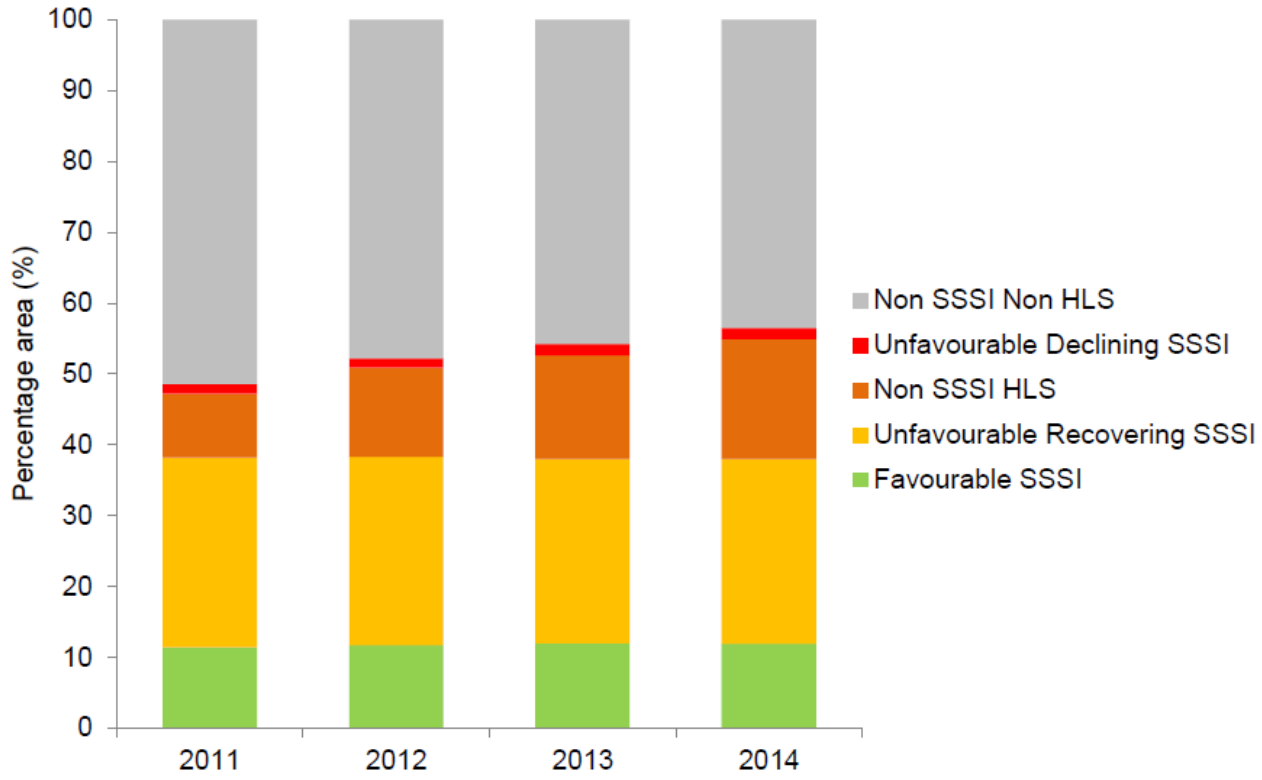
Red: plans and policies, delivery of actions, or progress in addressing vulnerabilities, are lacking.
Amber: adaptation priority has been partially addressed, some evidence of progress in some areas.
Green: plans are in place, actions are being delivered, progress is being made.
Grey: insufficient evidence to form a judgement.

1. Ecological condition of priority habitats and protected sites

Measure	Data series	Source	Trend	Implication
Condition of all priority habitats by area	2011-2014	Defra	⇧	Area in favourable or recovering condition has increased to 55%, but still some way off meeting the 90% target by 2020.
Cumulative proportion of SSSIs in favourable or unfavourable recovering condition	2003-2014	Defra	⇧	Over 96% of SSSIs are in favourable or recovering condition, but proportion in favourable condition (37.5%) is some way off meeting 50% target by 2020.
Proportion of SSSI in favourable or unfavourable condition for selected habitat types	2003 - 2014	Natural England	⇔	Proportion of most habitat types in favourable condition has either remained broadly the same or declined since 2003. Upland SSSIs are generally in less favourable condition than lowland SSSIs

1. Ecological condition of priority habitats and protected sites

Condition of priority habitats by area	⇧	Area in favourable or recovering condition has increased slightly to 55%, but still some way off meeting the 90% target by 2020.



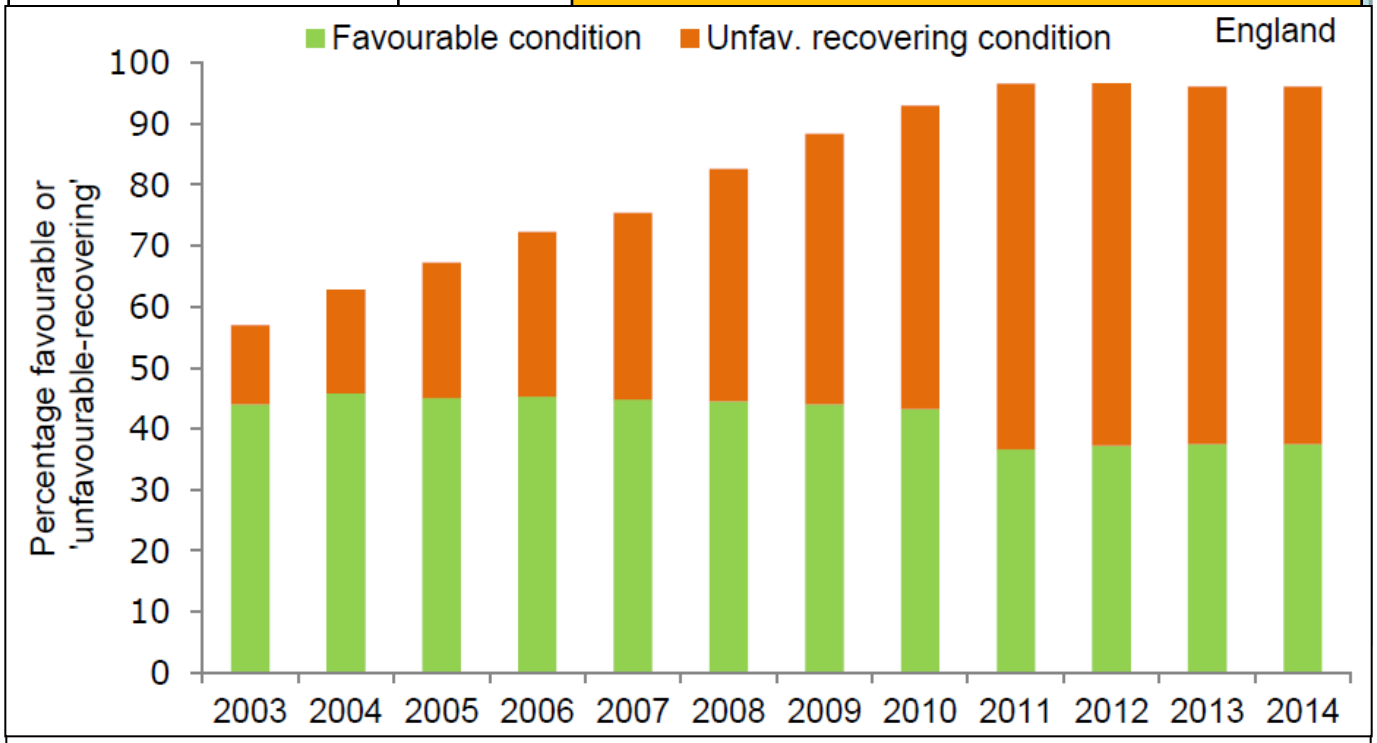
Notes: Chart shows the percentage area of all priority habitats in England in favourable, recovering and unfavourable condition. The condition figures are broken down by area within protected sites (SSSIs) and outside SSSIs under Higher Level Stewardship (HLS), which is used as a proxy for favourable management.

- The England Biodiversity 2020 strategy includes a target of 90% of priority habitats to be in a favourable or recovering condition by 2020.
- As of April 2014, just over 1 million hectares of priority habitat (55%) were in target condition.
- This amounts to 39% of priority habitats in SSSIs and 17% of priority habitats outside SSSIs in target condition.
- Since 2011 there has been an 8% increase in the area of priority habitat in target condition. This has been largely due to the take-up of HLS in non-SSSI areas of priority habitat.
- Defra is currently unable to report on the condition of 43% of priority habitats that occur outside the SSSI network and are not under HLS.

Source: Defra (2014) Biodiversity 2020 Indicators, p23

1. Ecological condition of priority habitats and protected sites

Cumulative proportion of SSSIs in favourable or unfavourable recovering condition.	⇧	Over 96% of SSSIs are in favourable or recovering condition, but proportion in favourable condition (37.5%) is some way off meeting 50% target by 2020.



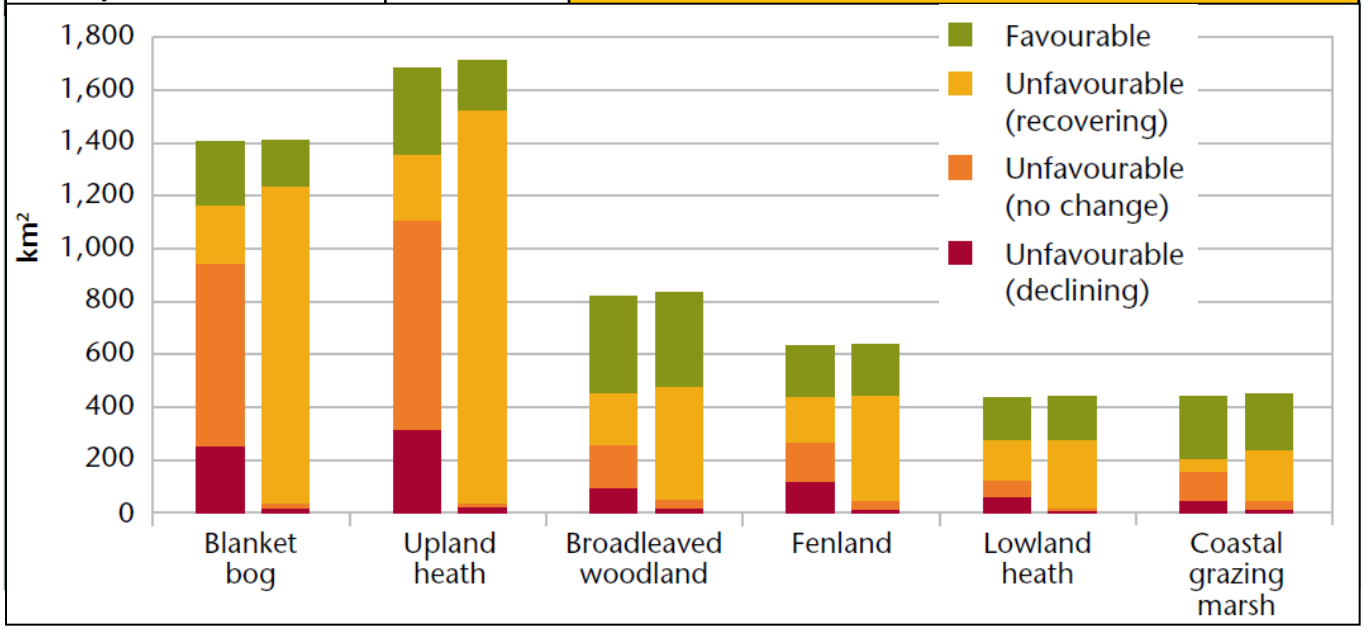
Notes: Figure shows the proportion of SSSI features, by area, meeting set condition criteria. Features are the species or habitats for which the site has been designated. Site condition is the cumulative area assessed in April of year shown.

- The area of SSSIs in unfavourable recovering has increased substantially, from 13% in 2003 to 57% in 2013.
- The overall proportion of SSSIs in favourable or unfavourable recovering condition has remained above 96% since 2011.
- There has been a net decrease in the area of SSSIs in favourable condition; down from 44% in 2003 to 37.5% in 2014.
- This reflects the difficulty in restoring species and habitats to favourable condition – it will take many years to reverse previous declines in species populations and restore the ecological functioning of degraded habitats.
- However, since 2011 there has been a small increase in the area in favourable condition, from 36.6% to 37.5%.

Source: Defra (2014) Biodiversity 2020 Indicators, p30

1. Ecological condition of priority habitats and protected sites

Proportion SSSIs in favourable or recovering condition for selected habitat types (2003 and 2013)	⇔	Proportion of most habitat types in favourable condition has either remained broadly the same or declined since 2003. Upland SSSIs are generally in less favourable condition than lowland SSSIs.



- Some habitat types have a much lower proportion of SSSIs in favourable condition than the national average
- Blanket bog is 14% favourable and upland heath 10%.
- Demonstrates that upland SSSIs are in less favourable condition than most lowland SSSIs, despite upland areas generally forming more extensive tracts of habitat.

Notes: SSSI condition data was obtained for 2003 (left-hand bar) and 2013 (right-hand bar) for selected priority habitats.

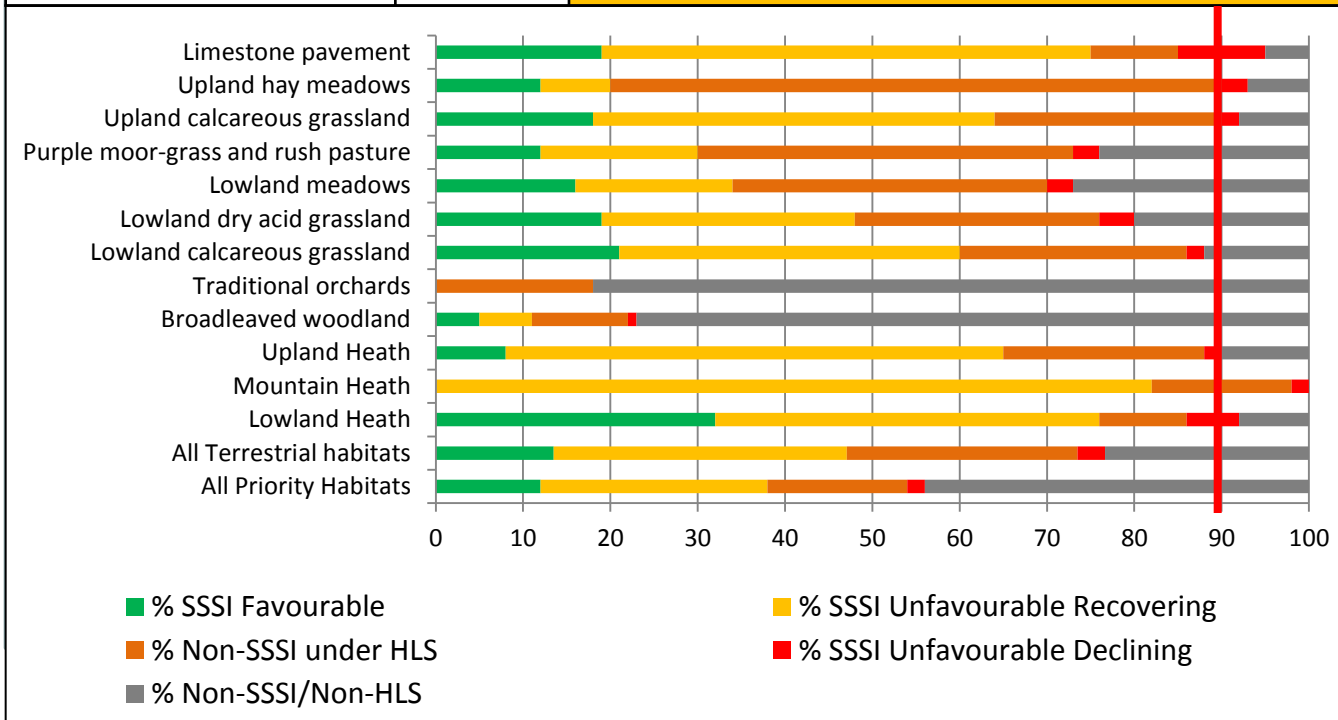
Source: ASC (2013) p62

1a. Ecological condition of terrestrial habitats

Measure	Data series	Source	Trend	Implication
Proportion of terrestrial priority habitats in favourable or recovering condition	2014	Defra	N/A	Time series data is not provided for different habitat types, so only 2014 data available. Nearly three-quarters of terrestrial priority habitats are in either a favourable or recovering condition against the 90% target by 2020. Note this is not by area.
Proportion of terrestrial SSSIs in favourable or recovering condition	2014	Natural England	N/A	Time series data not provided for different SSSI types, so only 2014 data available. Only one out of the 11 terrestrial habitat SSSI types currently meets the 50% in favourable condition target.
Area of woodland under certified management	2001-2013	Forestry Commission	⇔	Around one-third of woodlands are certified, but proportion has not increased since 2009.
Woodland bird index	1970 - 2014	Defra	⇩	Around 25% of populations in long-term decline, but more stable since 2007
Woodland butterfly index	1990 - 2014	Defra	⇩	Nearly 60% of populations in decline since 1990, but with annual fluctuations

1a. Ecological condition of terrestrial habitats

Proportion of terrestrial priority habitats in favourable or recovering condition (2014).	**N/A**	Nearly three-quarters of terrestrial priority habitats are in either a favourable or recovering condition against the 90% target by 2020.



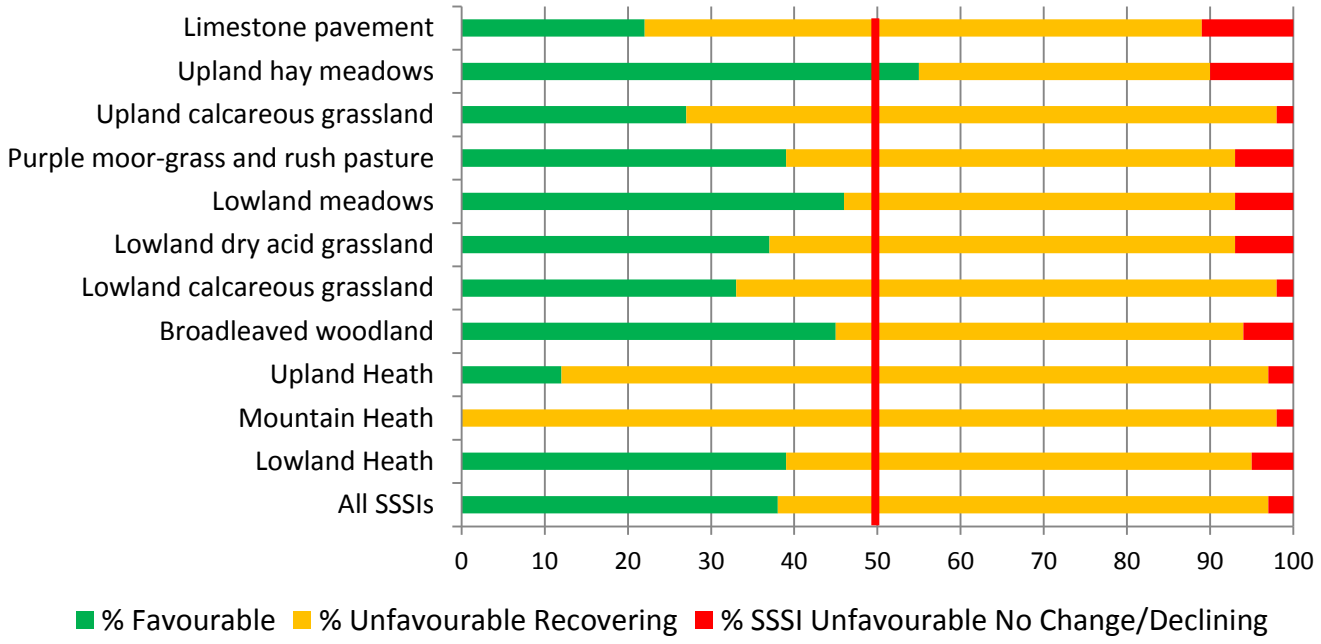
Notes: Time series data is not provided for specific habitat types. Data is for April 2014.

- Terrestrial habitats make up nearly two-thirds of all priority habitat in England
- Broadleaved woodland is the largest priority habitat, covering 700,000 ha. Heathland habitats make up 300,000 ha and grasslands 140,000 ha.
- 74% of terrestrial priority habitats were classed as being in target condition.
- The majority (78%) of broadleaved woodland is not in target condition. This reflects the uncertainty regarding the condition of non-SSSI and non-HLS priority habitats.

Source: Defra (2014) Biodiversity 2020 Indicators, p30

1a. Ecological condition of terrestrial habitats

Proportion of terrestrial SSSIs in favourable or recovering condition (2014)	**N/A**	Time series data not provided for different SSSI types, so only 2014 data available. Only one out of the 11 terrestrial habitat SSSI types currently meets the 50% in favourable condition target.



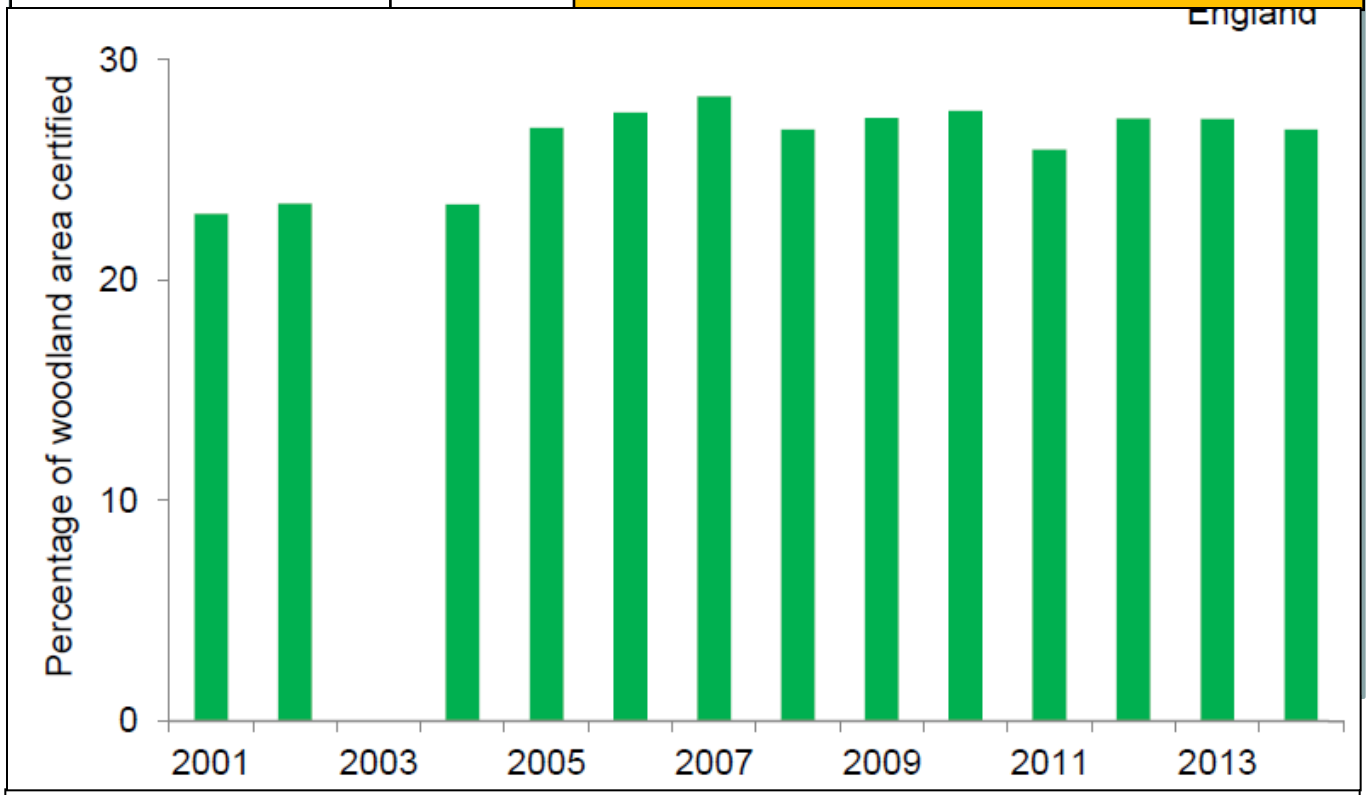
Notes: Figure shows the proportion of SSSI features, by area, meeting set condition criteria.

- Upland hay meadows are the only type of terrestrial habitat currently meeting the 50% SSSI target
- Upland heath make up 43% of all terrestrial SSSIs but only 12% are in favourable condition.

Source: Defra (2014) Biodiversity 2020 Indicators, p29

1a. Ecological condition of terrestrial habitats

Proportion of woodland in England being sustainably managed	⇔	Around one-third of woodlands are certified, but proportion has not increased since 2009.



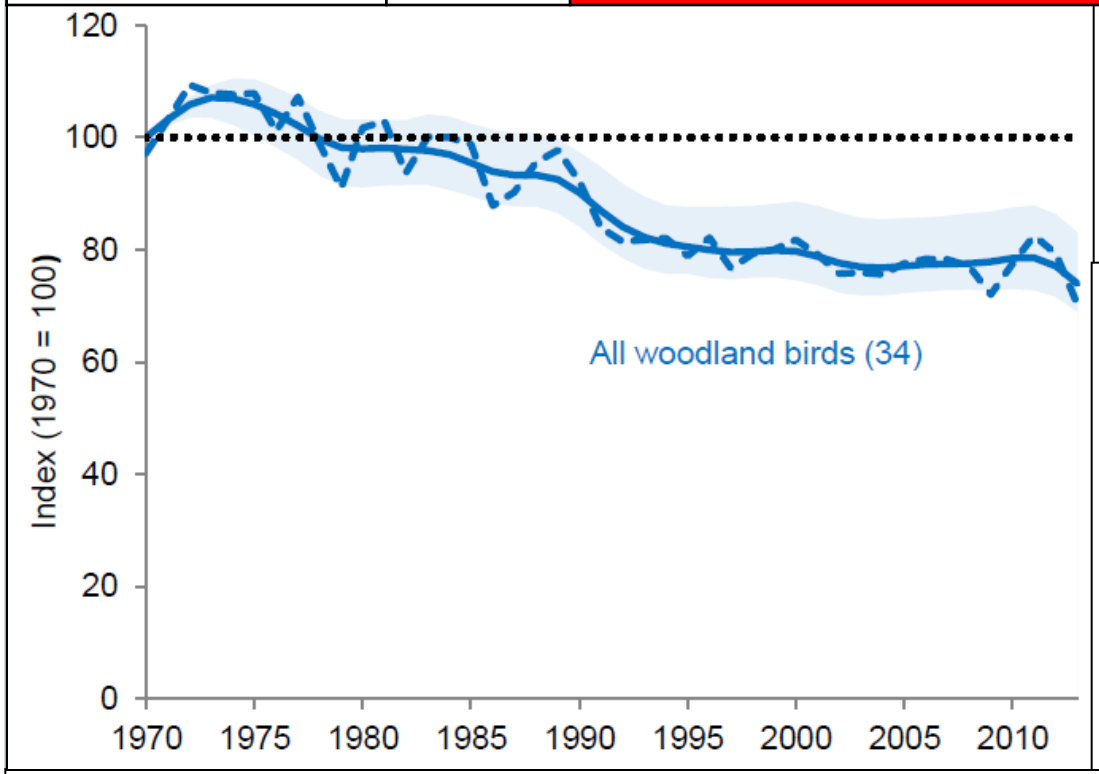
Notes: Percentage of woodland area in England that is certified against agreed environmental standards. Figures relate to certification valid as at 31st March 2014. Data collection by the Forestry Commission started in 2001 with regular data collection from 2004.

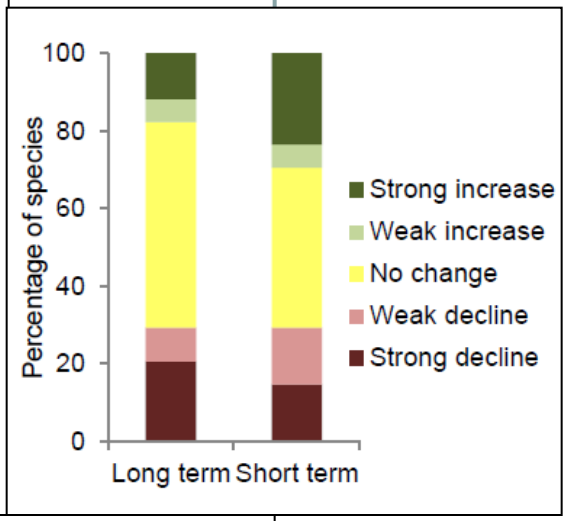
- Woodland certification schemes promote good forest practice and are used to demonstrate that wood or wood products come from well-managed forests
- 349,000 ha were certified in 2014, representing 27% of total woodland area. Of this, 215,000 ha is Forestry Commission woodland.
- The proportion certified has remained constant since 2009.

Source: Defra (2014) Biodiversity 2020 Indicators, p174

1a. Ecological condition of terrestrial habitats

Woodland bird index	⇩	Around 25% of populations in long-term decline, but more stable since 2007





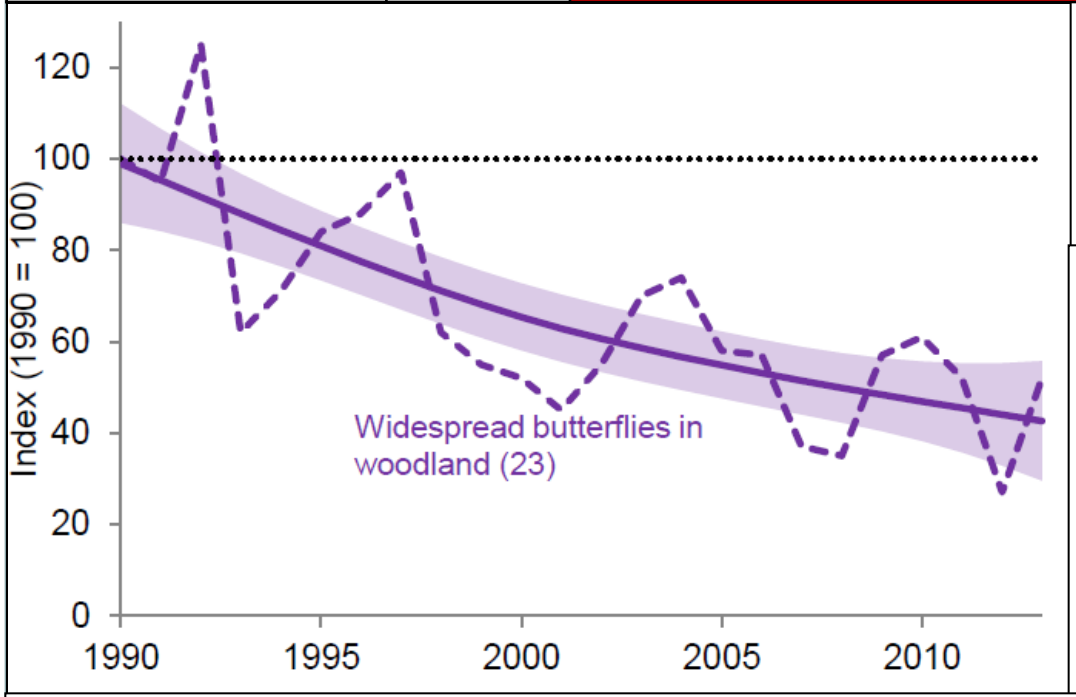
- In 2013 index reached lowest level, 28% below 1990 value.
- Greatest decline between late 1980s to mid 1990s.
- Has been more stable since, only decreasing by 1% between 2007 and 2012.

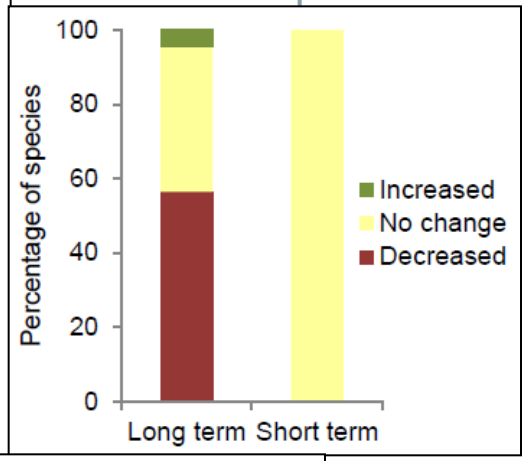
Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

Source: Defra (2014) Biodiversity 2020 Indicators, p75

1a. Ecological condition of terrestrial habitats

Woodland butterfly index	⇩	**Nearly 60% of populations in decline since 1990, but with annual fluctuations**





- Since 1990 abundance has declined by 48% reaching historical low point in 2012.
- A substantial recovery was made in 2013, demonstrating how numbers can fluctuate.
- Statistical analysis of the smoothed trends shows no overall trends since 2008.

Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

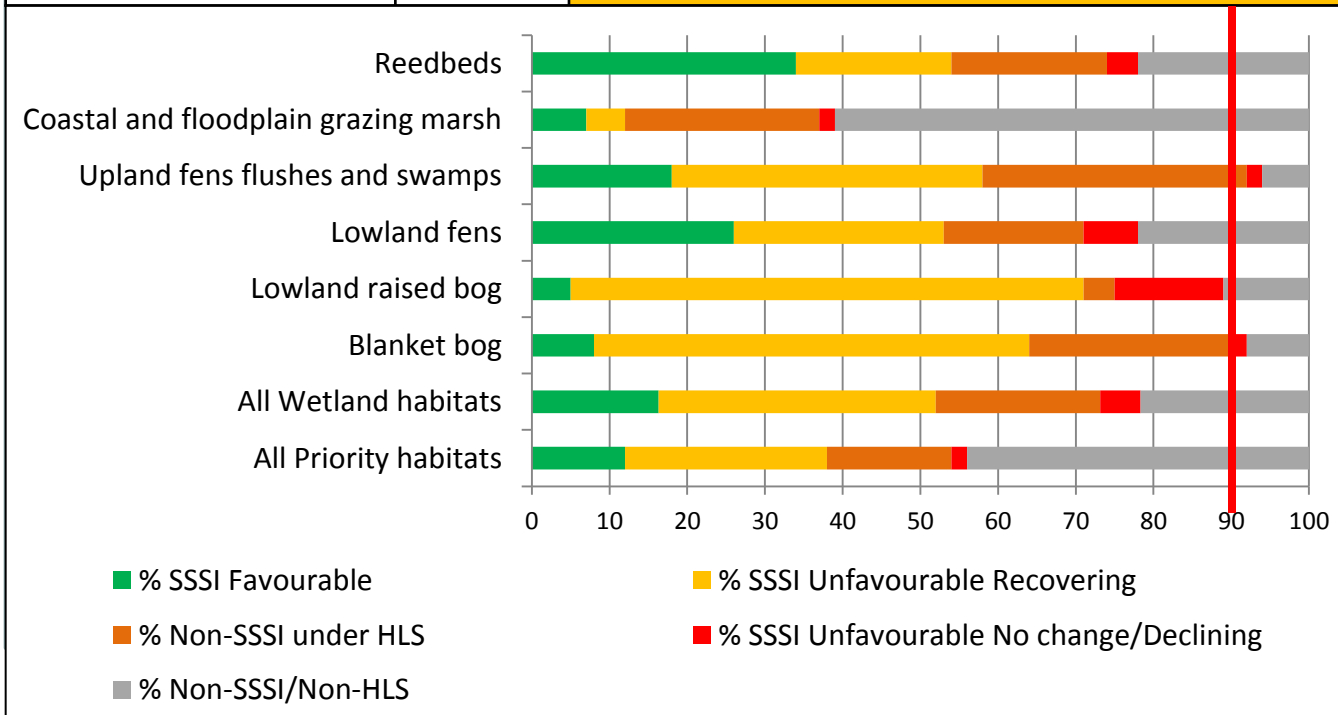
Source: Defra (2014) Biodiversity 2020 Indicators, p76

1b. Ecological condition of wetland habitats

Measure	Data series	Source	Trend	Implication
Proportion of wetland priority habitats in favourable or recovering condition	2014	Defra	N/A	Nearly three-quarters of wetland priority habitats are in either a favourable or recovering condition against the 90% target by 2020.
Proportion of wetland SSSIs in favourable or recovering condition	2014	Defra	N/A	Only two out of the six wetland habitat SSSI types currently meets the 50% in favourable condition target.
Area of blanket bog SSSI in favourable condition	2003-2013	Natural England	⇩	Area in favourable condition has declined, but significant increase in area classed as recovering.
Burning regimes on blanket bog		Yallop et al (2006)	⇧	Area and extent of blanket bog and wet heath under intensive rotational burning regimes has significantly increased since mid-1990s.
Trends in raw water colour	1990-2012	Yorkshire Water	⇧	Upland water companies are reporting increasing trend of colour in drinking water supplies, with spikes in colour caused by weather events

1b. Ecological condition of wetland habitats

Proportion of wetland priority habitats in favourable or recovering condition (2014).	**N/A**	Nearly three-quarters of wetland priority habitats are in either a favourable or recovering condition against the 90% target by 2020.



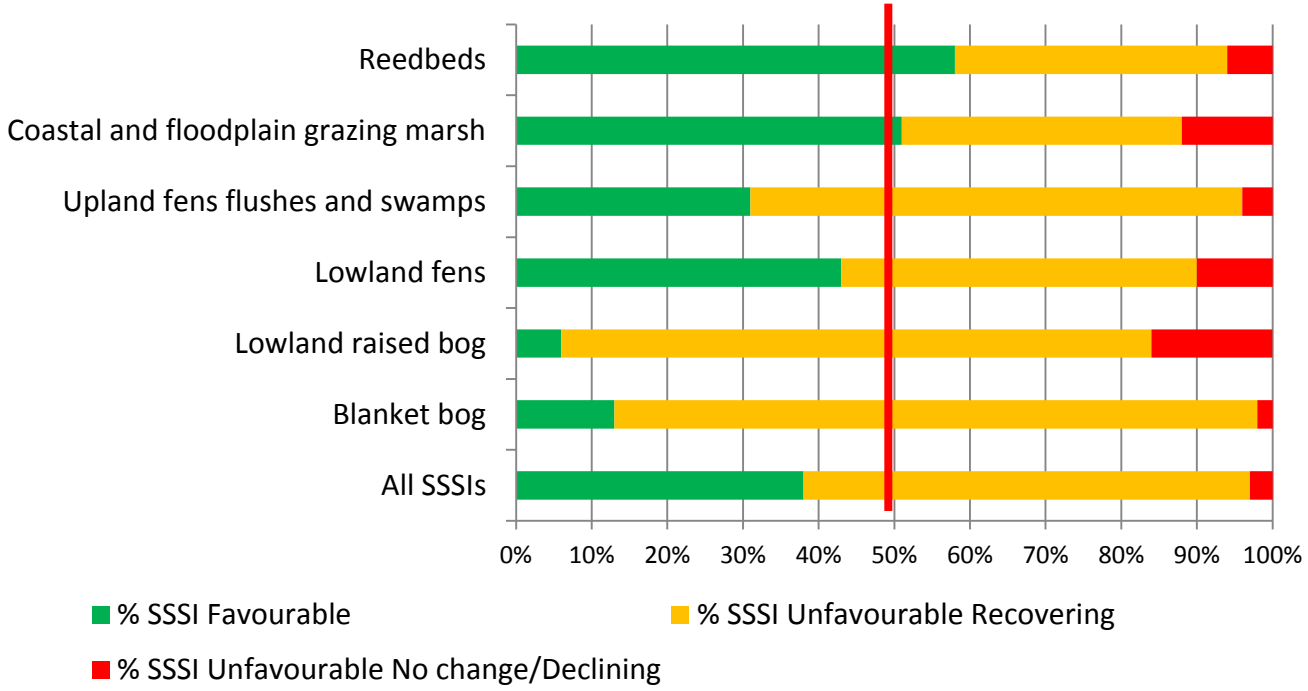
Notes: Time series data is not provided for specific habitat types. Data is for April 2014.

- Wetland habitats make up nearly one-thirds(29%) of all priority habitat in England, covering over half a million hectares.
- Blanket bog is the largest priority habitat, covering 280,000 hectares.
- 72% of wetland priority habitats were classed as being in target condition.

Source: Defra (2014) Biodiversity 2020 Indicators, p30

1b. Ecological condition of wetland habitats

Proportion of wetland SSSIs in favourable or recovering condition (2014)	N/A	Only two out of the six wetland habitat SSSI types currently meets the 50% in favourable condition target.



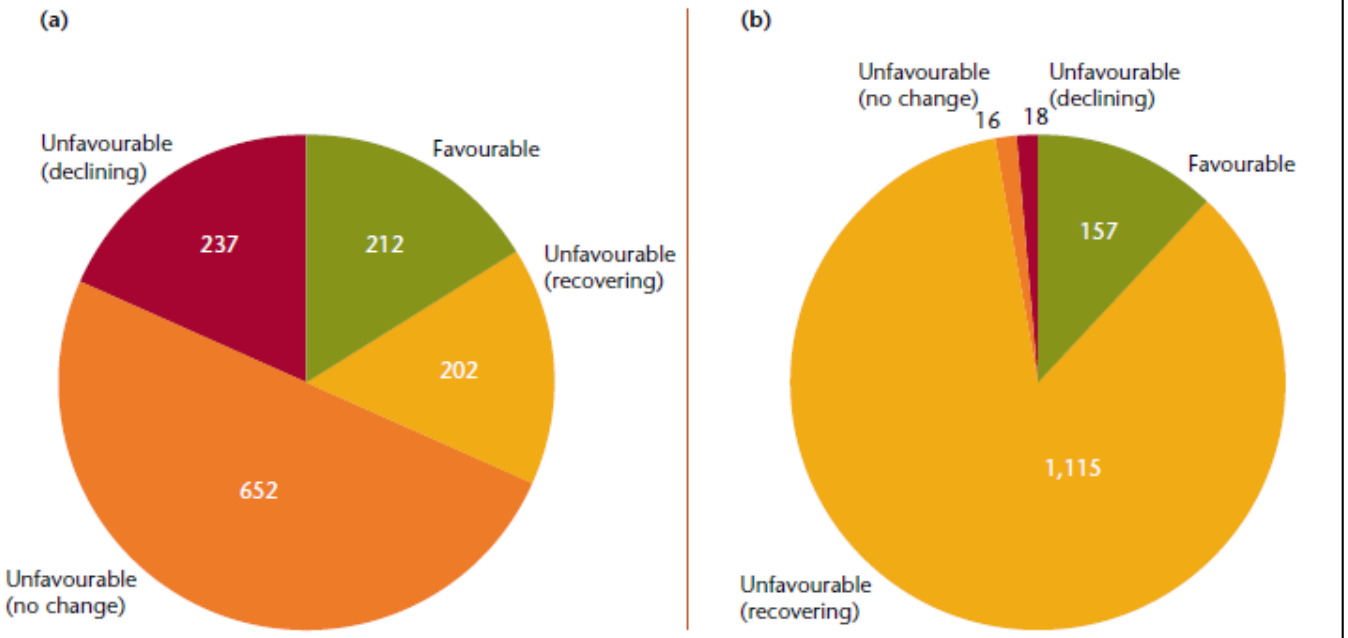
Notes: Figure shows the proportion of SSSI features, by area, meeting set condition criteria.

- Only two of the six wetland habitats currently meet the 50% SSSI target
- Overall, only 20% of wetland habitats are in favourable condition by area, some way off the 50% target
- The two peat bog habitats (blanket bog and raised bog) are a long way from the target.

Source: Defra (2014) Biodiversity 2020 Indicators, p29

1b. Ecological condition of wetland habitats

Area of SSSI blanket bog in favourable condition (a) 2003 and (b) 2013	⇩	Area in favourable condition has declined, but significant increase in area classed as recovering.



Notes: Numbers on chart is the area in square kilometres.

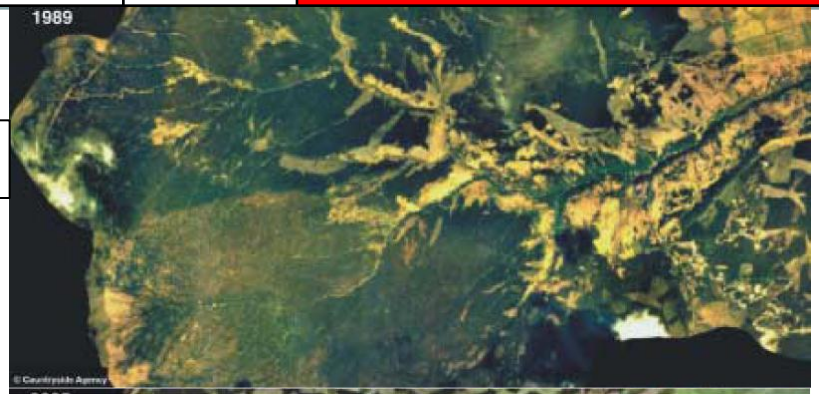
- The majority (67%) of blanket bog habitat in England has been designated as SSSI.
- Blanket bog is the dominant habitat type designated for protection under the EU Habitats Directive, accounting for 25% of the total area of SAC in England.
- Of the 187,000 ha of blanket bog SSSI, 13% was assessed as being in a favourable condition in 2013, a decline from 16% in 2003.
- As with all SSSIs in England, there has been a substantial increase in the proportion of blanket bog classed as recovering, from 20,000 ha in 2003 to 110,000 ha in 2013.

Source: ASC (2013)

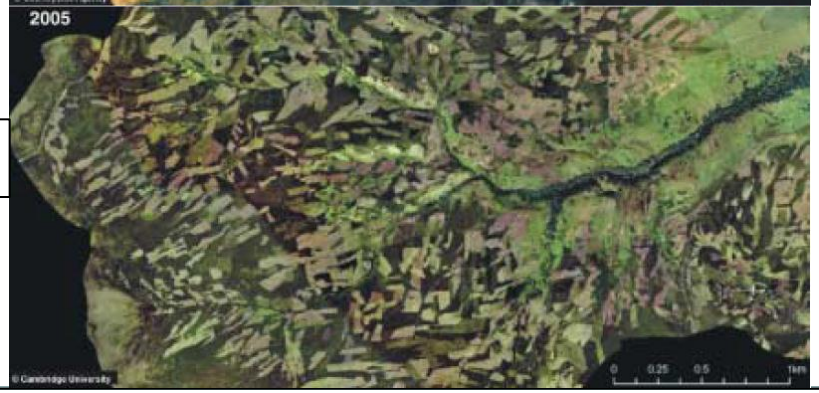
1b. Ecological condition of wetland habitats

Burning regimes on blanket bog	⇧	Area and extent of blanket bog and wet heath under intensive rotational burning regimes has significantly increased since mid-1990s.

1989



2005



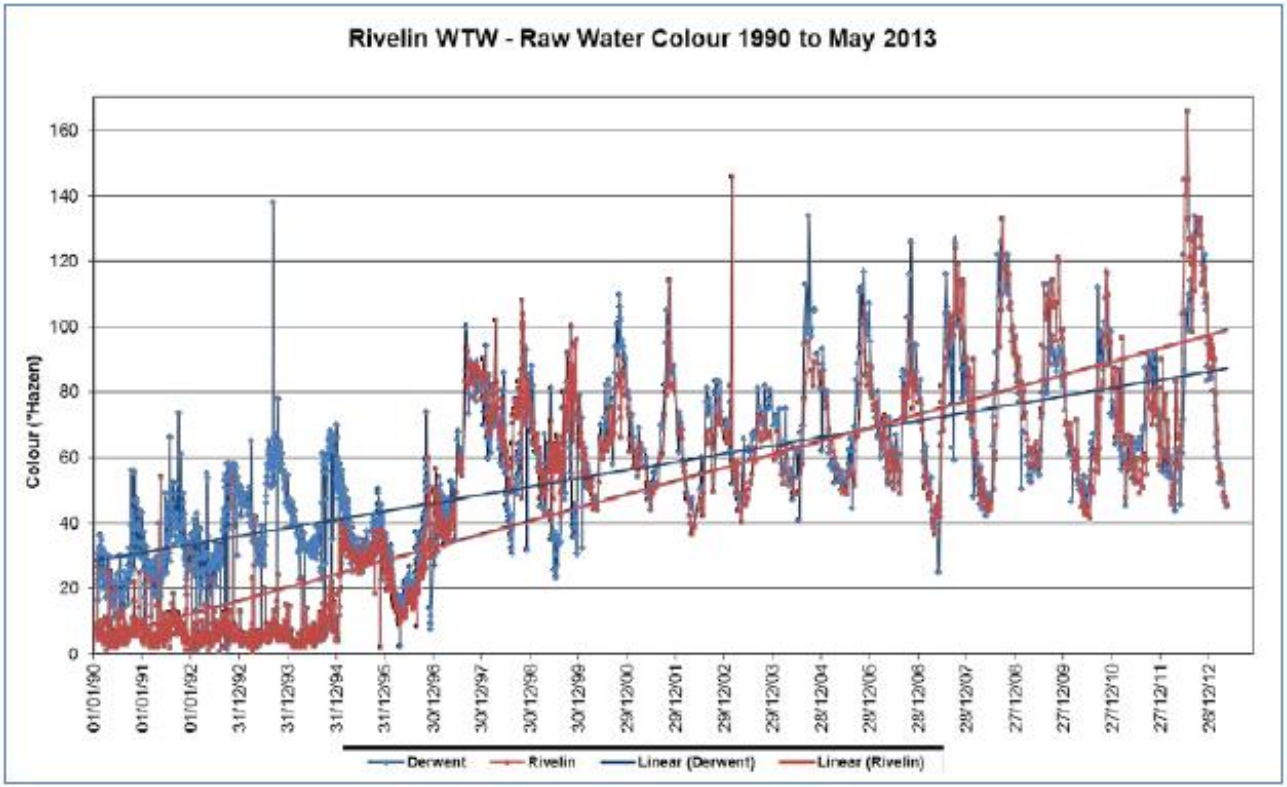
Notes: Images show example of changing in burning practice at a landscape scale. Area shown is within Peak District National Park and was designated as blanket bog/wet heath SSSI in 1992

- Within most English upland national parks there has been a significant increase in the extent of new burns, from 15% to 29% of the area in last 20 years.
- This indicates an intensification in burning practices over that period.
- Now nearly impossible to find any extensive or continuous heather-dominated moorland in England that has not been burnt within last 10 years.
- This intensification is being driven by landmanagement for grouse.

Source: Yallop et al (2006).

1b. Ecological condition of wetland habitats

Trends in raw water colour	⇧	Upland water companies are reporting increasing trend of colour in drinking water supplies, with spikes in colour caused by weather events.



Notes: Data for Rivelin Water Treatment Works, South Yorkshire

- Water companies monitor the amount of colour in drinking water supplies before it reaches treatment works ('raw' water).
- High levels of colour can be caused by high carbon content (DOC) in water bodies.
- Colour in raw water can result in carcogenic by-products being produced when the water is disinfected. Water companies have to remove the carbon content from the raw water before it is treated to reduce this risk, which is an expensive process.
- There was a dramatic change in colour levels and variability for Yorkshire Water's Rivelin treatment plant following the drought in 1995/96, when very low rainfall led to extensive drying of peat.
- The quality of raw water changed significantly from this point onwards, with a tendency for more volatility and significantly higher peak colour values.
- The colour peak in July 2012 followed extended period of intense rainfall events and was measured at 166 0H, the highest level recorded.

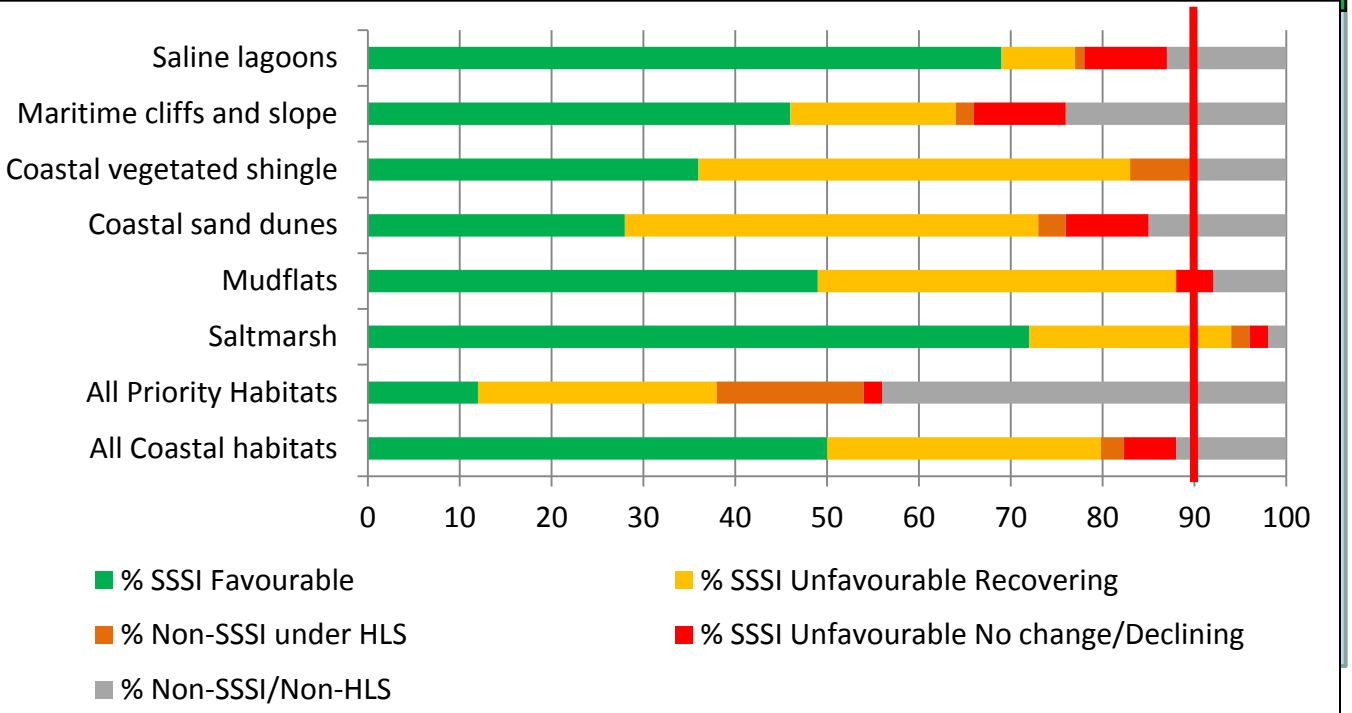
Source: Yorkshire Water (2013)

1c. Ecological condition of coastal habitats

Measure	Data series	Source	Trend	Implication
Proportion of coastal priority habitats in favourable or recovering condition	2014	Defra	**N/A**	By 2014, 82% of priority coastal habitats were in either a favourable or recovering condition against the 90% by 2020 target.
Proportion of coastal SSSIs in favourable or recovering condition	2014	Defra	**N/A**	Coastal habitats already meet the 50% SSSI target.

1c. Ecological condition of coastal habitats

Proportion of coastal priority habitats in favourable or recovering condition (2014)	**N/A**	By 2014, 82% of priority coastal habitats were in either a favourable or recovering condition against the 90% by 2020 target.



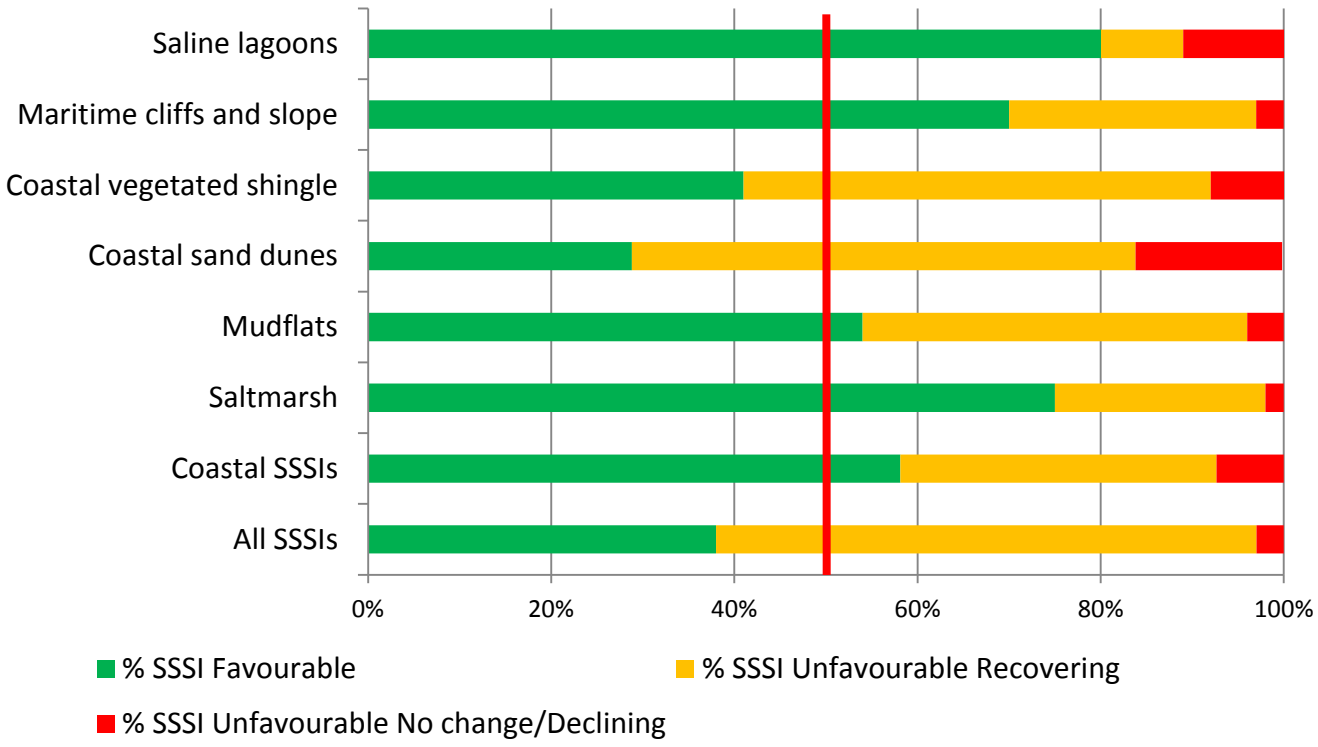
Notes: Time series data is not provided for specific habitat types. Data is for April 2014

- Coastal habitats make up around 7% of the total area of priority habitat in England, covering an area of 130,000 hectares.
- Only one coastal habitat (saltmarsh) already meets the 90% target. However, over 80% of mudflats and shingle beaches are in target condition.

Source: Defra (2014) Biodiversity 2020 Indicators, p30

1c. Ecological condition of coastal habitats

Proportion of coastal SSSIs in favourable or recovering condition (2014)	**N/A**	Coastal habitats already meet the 50% SSSI target.



Notes: Figure shows the proportion of SSSI features, by area, meeting set condition criteria.

- Four of the six coastal habitat types already meet the 50% SSSI target.
- Sand dunes are a significant exception, with only 29% in favourable condition.
- Overall, 57% of coastal habitats are in favourable condition meaning the 2020 target has already been met.

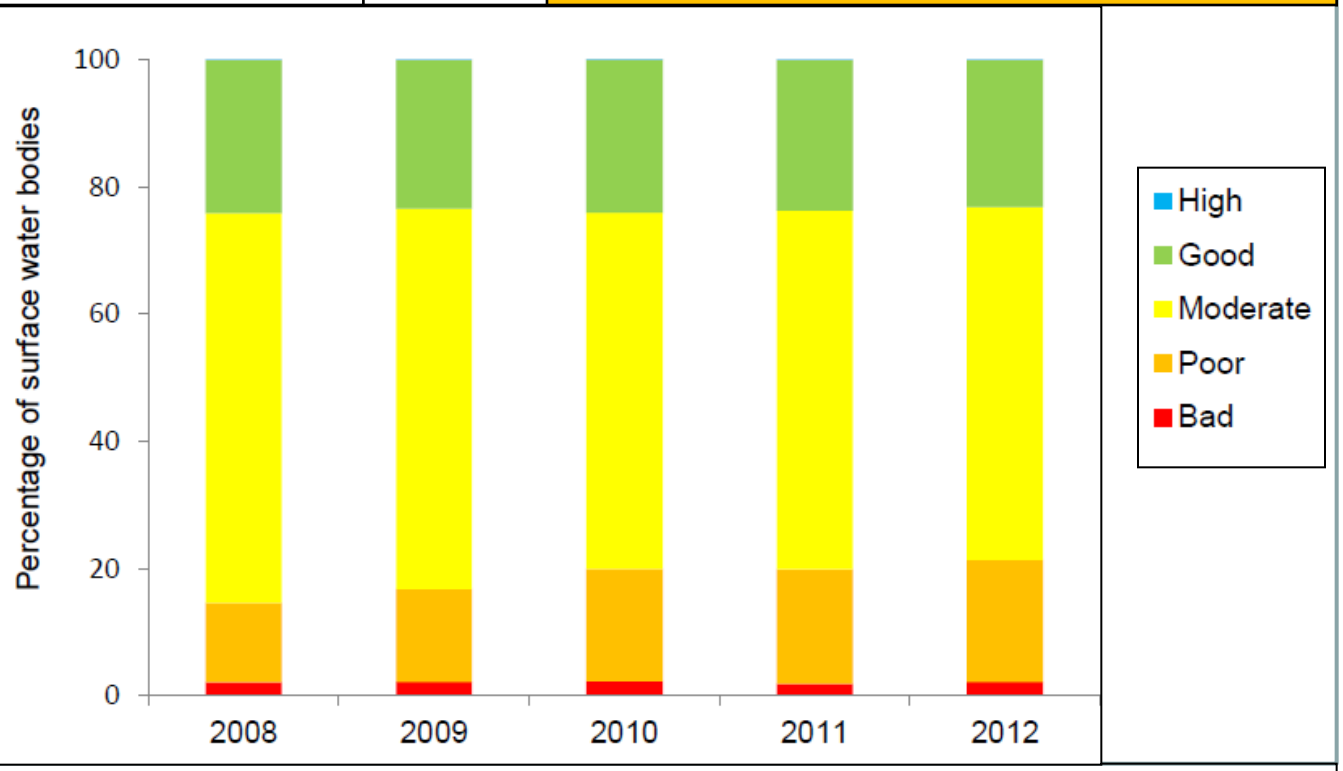
Source: Defra (2014) Biodiversity 2020 Indicators, p30

1d. Ecological condition of rivers, lakes, estuaries

Measure	Data series	Source	Trend	Implication
Proportion of surface water bodies meeting good status	2008-2012	Environment Agency	⇔	No significant change, with just less than one-quarter meeting good status.
Proportion of rivers, lakes and coastal water meeting good status	2008-2012	Environment Agency	⇔	Lakes have slightly higher proportions meeting good status than rivers or coastal waters.
Delivery of Restoring Sustainable Abstraction programme	2008-2015	Environment Agency	⇧	Nearly half of the total number of licences in the programme have been reviewed.
Change in wetland bird populations	1975-2010	Defra	⇔	Long-term populations of breeding wetland birds have remained broadly stable whereas migratory waterbirds have increased. But both have seen declines more recently.

1d. Ecological condition of rivers, lakes, estuaries

Proportion of water bodies meeting good status	⇔	No significant change, with just less than one-quarter meeting good status.



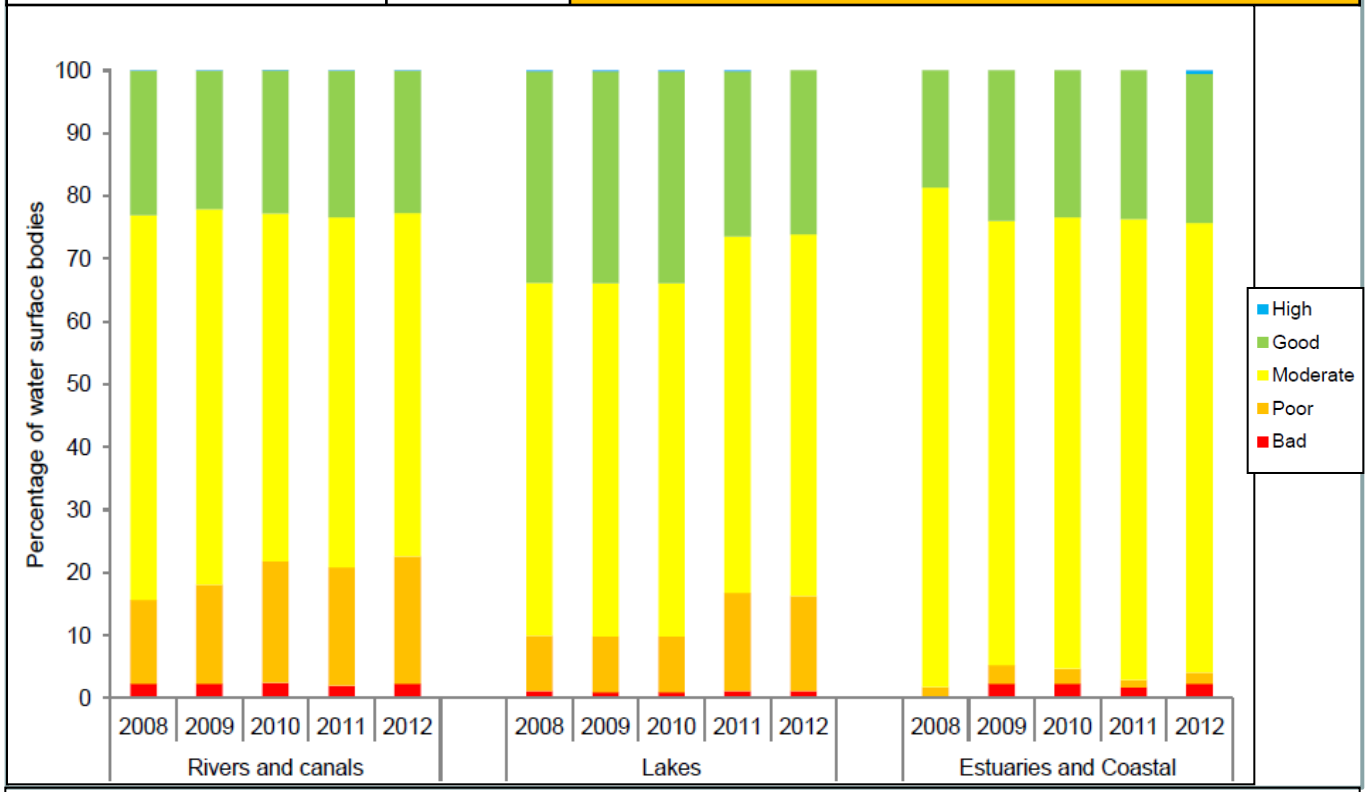
Notes: Based on numbers of surface water bodies classified under the Water Framework Directive in England. Includes rivers, lakes, canals, estuaries and coastal water bodies but excludes SSSI ditches and surface water transfers. Percentage of water bodies in each status class has been calculated based on the total number of water bodies assessed in each year.

- The Water Framework Directive (WFD) is an important mechanism for assessing and managing the water environment across the EU.
- Over 5,500 water bodies are assessed on a six-year rolling programme and categorised between high and bad status based on biological and chemical indicators, as well as water flows and levels.
- There was no significant change in the overall number of surface water bodies awarded good or high status between 2008 and 2012. In 2012, 23% of surface water bodies assessed in England were good or high status.

Source: Defra (2014) Biodiversity 2020 Indicators, p165

1d. Ecological condition of rivers, lakes, estuaries

Water body status by type	⇔	Lakes have slightly higher proportions meeting good status than rivers or coastal waters.



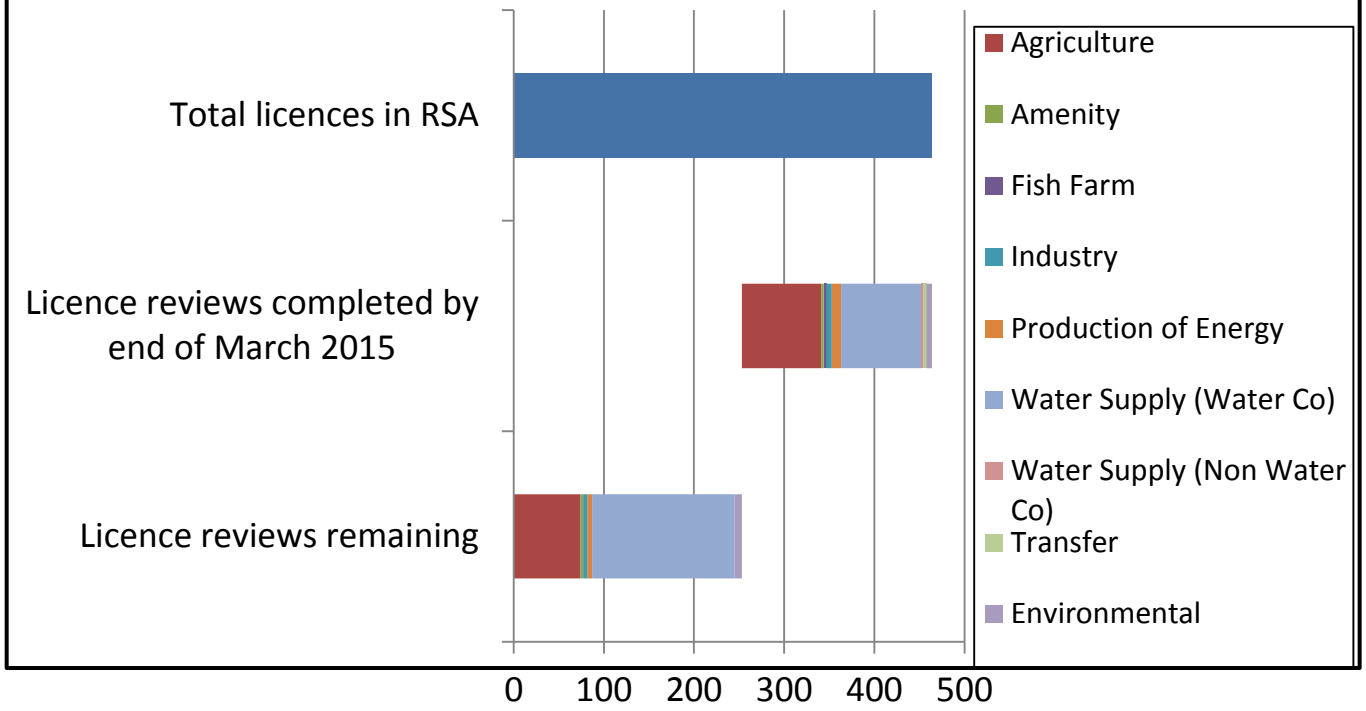
Notes: Based on numbers of surface water bodies classified under the Water Framework Directive in England. Includes rivers, lakes, canals, estuaries and coastal water bodies but excludes SSSI ditches and surface water transfers. Percentage of water bodies in each status class has been calculated based on the total number of water bodies assessed in each year.

- In 2012, 23% of rivers were classed as being good or high status.
- 26% of lakes were good or high status.
- 24% of coastal waters and estuaries were good or high status.
- Only 4 water bodies out of 5,735 were classed as being high status in 2012.
- Some water bodies have seen a decline in condition. The proportion of rivers in poor or bad status increased from 17% in 2008 to 20% in 2012.
- The proportion of in poor or bad condition has also increased.

Defra (2014) Biodiversity 2020 Indicators, p168

1d. Ecological condition of rivers, lakes, estuaries

Delivery of Restoring Sustainable Abstraction programme	⇧	Progress is on track for the most unsustainable abstraction licenses to be reviewed by 2020. Nearly half of the licences in the programme have been reviewed to date.



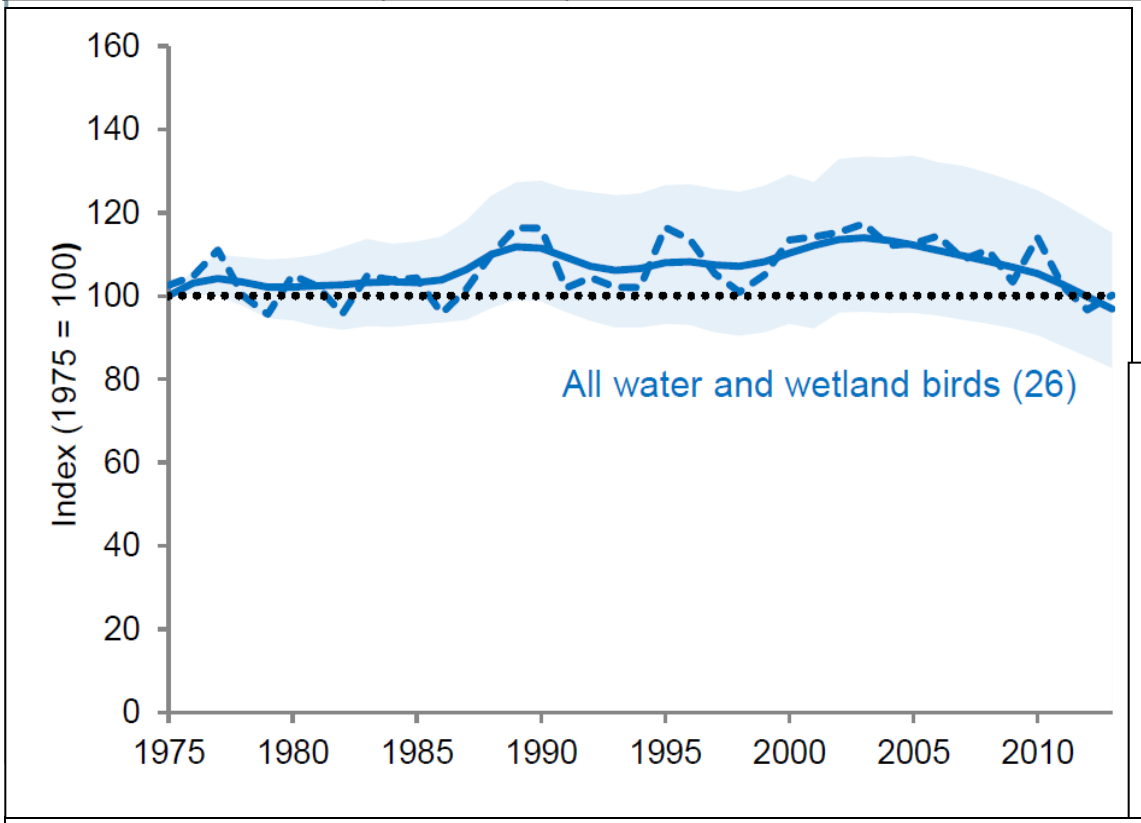
Notes: Graph shows number of licences in the RSA programme.

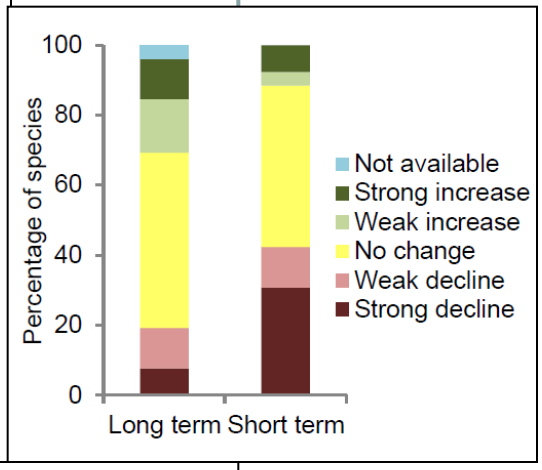
- The Environment Agency's Restoring Sustainable Abstraction programme has identified nearly 500 abstraction licences that are causing particular problems for protected sites (SSSIs/SACs/SPAs).
- The RSA programme aims to review these licences with the aim of reducing the risk of over-abstraction in times of water scarcity. The programme began the reviews in 2008.
- Around 80% of these licences are for agricultural use or public water supply.
- By March 2015 nearly half (211 out of 464) had been reviewed. One-fifth of these were revoked.

Source: Environment Agency data

1d. Ecological condition of rivers, lakes, estuaries

Breeding wetland bird index	⇔	Long-term populations have remained broadly stable, but declined since 2007.





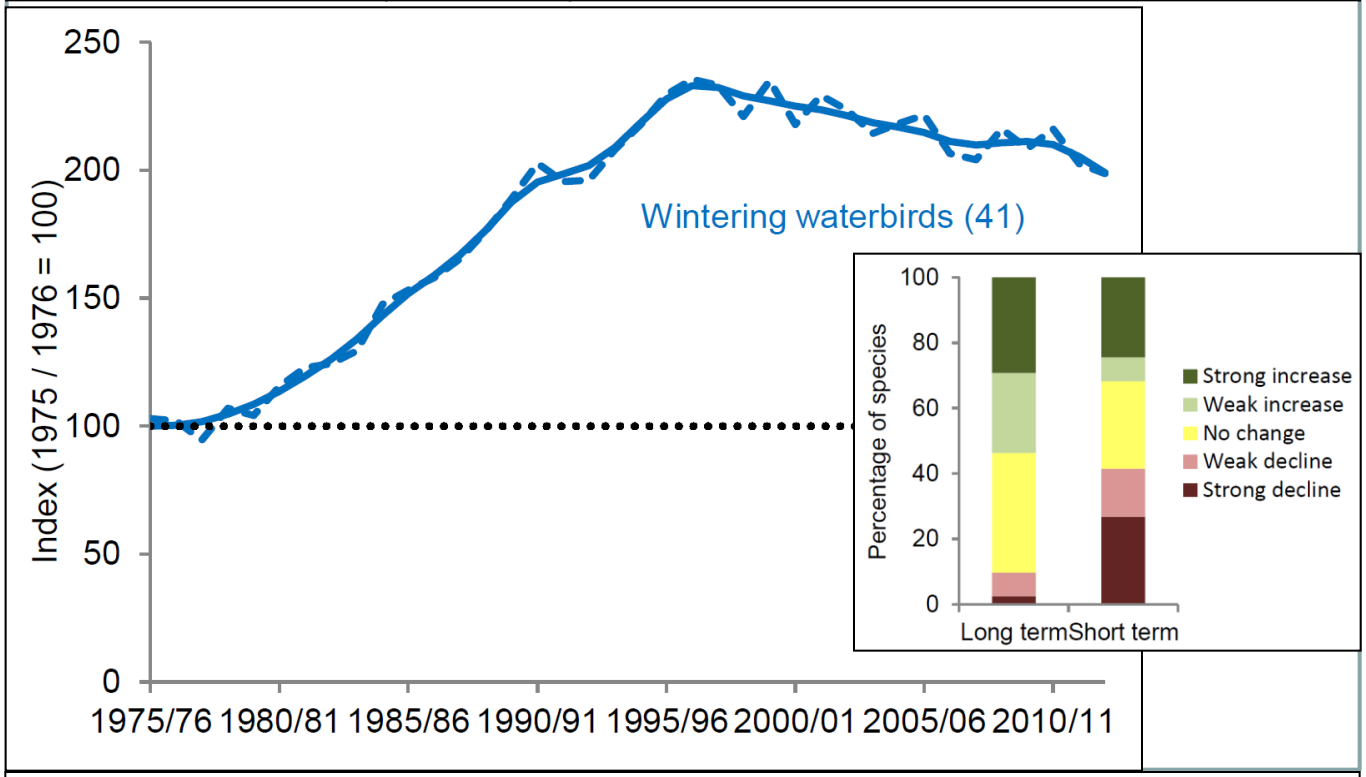
- Between 1975 and 2010 populations have fluctuated, but remained broadly stable.
- However, there has been a statistically significant decline of 9% in the short term between 2007 and 2012.
- Birds of wet grasslands such as snipe and redshank have declined dramatically.

Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

Source: Defra (2014) Biodiversity 2020 Indicators, p85

1d. Ecological condition of rivers, lakes, estuaries

Wintering waterbird index	⇔	Significant increase in abundance since mid-1970s, although declines more recently.



Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

- Winter 2013/14 saw a 2% fall in the index to a value just under double (93%) its 1975/76 level.
- There has been a downturn in populations since the mid-1990s.
- Populations of whooper swan, grent goose and gadwell have increased 14-fold since 1975/76. Populations of greylag geese increased 40-fold.
- Increases since 1975/76 thought to be due to better protection for migratory sites, better regulation of hunting and changes in land management practices.
- Downturn since mid-1990s may in part be due to changes in migration patterns for some species in response to milder winters.

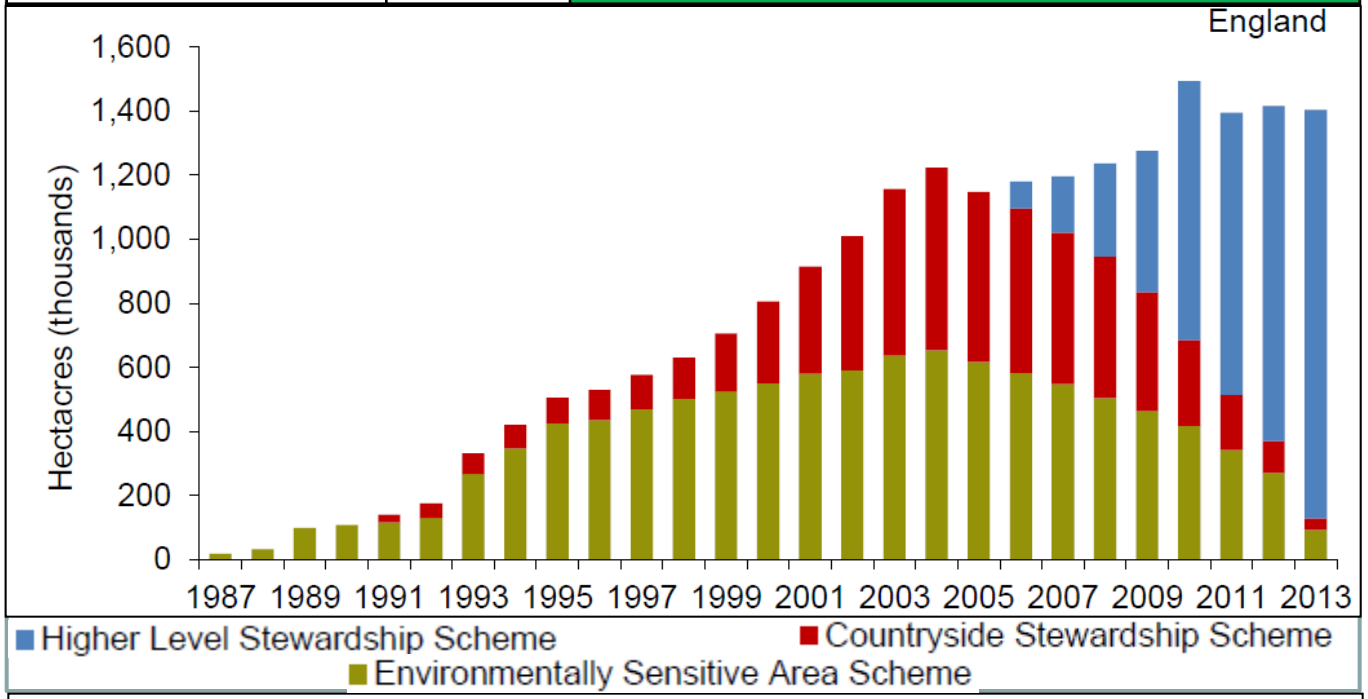
Source: Defra (2014) Biodiversity 2020 Indicators, p86

1e. Ecological condition of farmed countryside

Measure	Data series	Source	Trend	Implication
Area of land covered by targeted agri-environment schemes	1987-2013	Defra	⇧	Increase in area of land benefitting from habitat protection and restoration.
Area of land under non-targeted Entry Level Scheme	2003-2013	Defra	⇧	Increase in area of land benefitting from environmental improvements.
Area of land under priority ELS options	2011-2014	Defra	⇧	Increase in area of land being managed in ways to enhance resilience
Breeding birds on farmland index	1970-2014	Defra	⇩	Long-term declines in abundance of indicator species.
Farmland bird index – specialists and generalists	1970-2014	Defra	⇩	Long-term decline in specialist compared to generalist species, suggesting reductions in diversity.
Farmland butterfly index	1990-2014	Defra	⇩	Populations in decline since 2008, but with annual fluctuations.
Farmland bat index	1999-2014	Defra	⇔	Improvements in species abundance, although stable in short term.
Bee species occupancy	1980-2010	Defra	⇩	Long-term and short-term declines with adverse implications for pollination.

1e. Ecological condition of farmed countryside

Area covered by targeted agri-environment schemes	⇧	Increase in area of land benefitting from habitat protection and restoration.



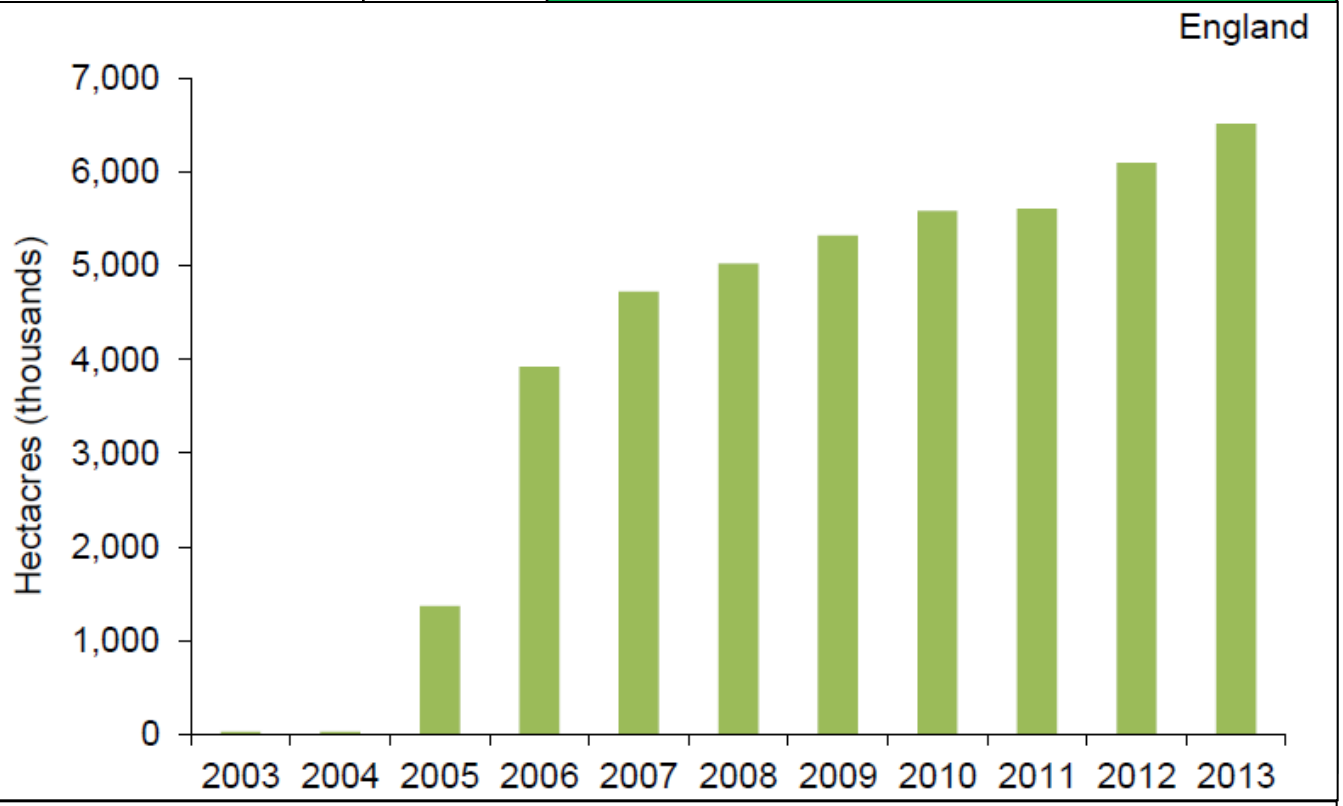
Notes: Systematic data collection started in 1992, areas from 1987 to 1991 are estimated. Uptake are cumulative area assessed in December of year shown.

- Targeted agri-environment schemes protect or restore land, focussing on parts of the farm or land-holding of high environmental/biodiversity value.
- The total area of land under targeted agri-environment schemes increased from 35,000 ha in 1987 to 1.4 million ha in 2013, around 15% of total agricultural land in England.

Source: Defra (2014) Biodiversity 2020 Indicators, p171

1e. Ecological condition of farmed countryside

Area covered by Entry Level Scheme (ELS)	⇧	Increase in area of land benefitting from environmental improvements.



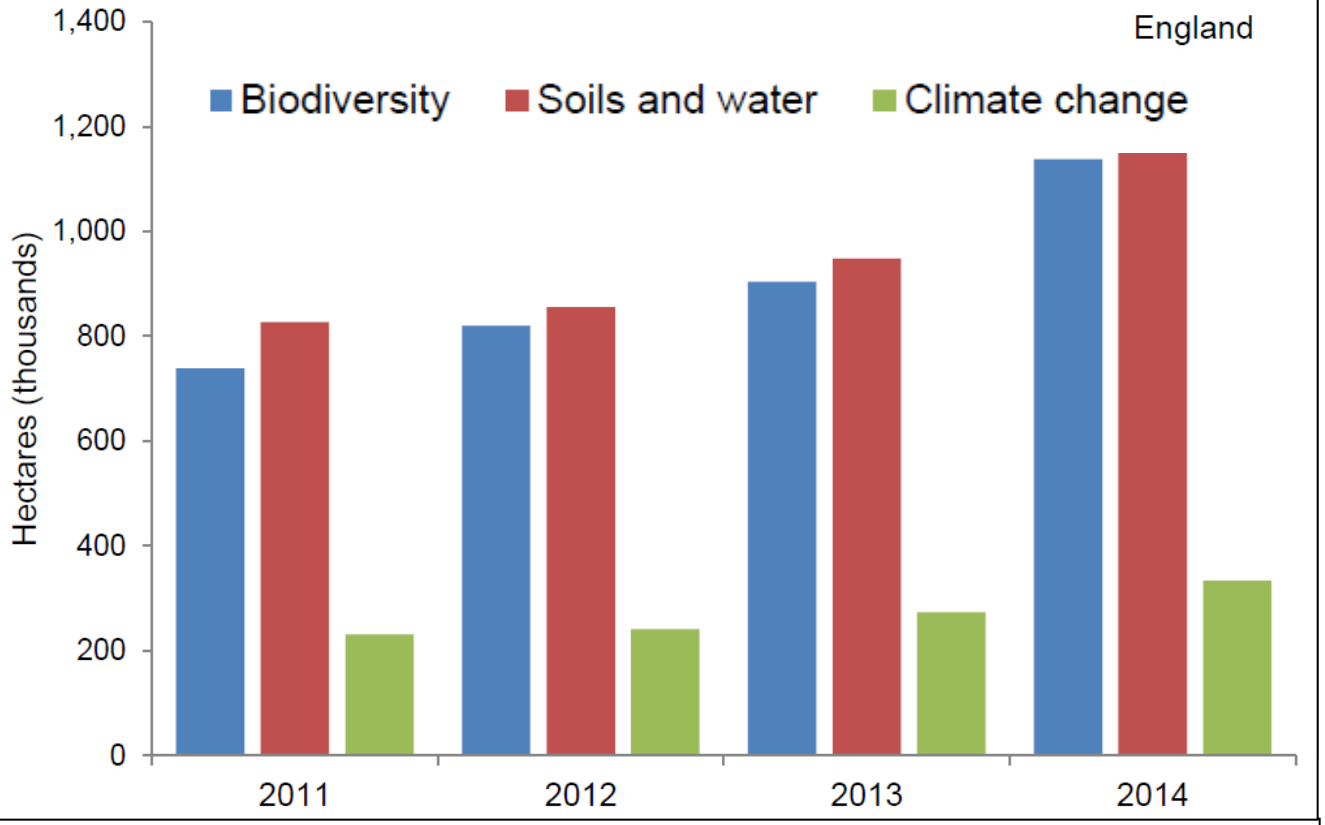
Notes: Uptake figures are cumulative area assessed in December of year shown. Area under ELS includes Organic ELS and Upland ELS (from 2010) and HLS linked to ELS.

- Entry Level Schemes are whole-farm schemes that have a simple set of prescriptions providing basic environmental protection and enhancement.
- ELS is open to any farm or land-holding on a voluntary basis.
- The area of agricultural land under ELS showed a significant increase following pilot schemes in 2003/2004 reaching 6.5 million ha in 2013, 72% of available farmand.

Source: Defra (2014) Biodiversity 2020 Indicators, p172

Ecological condition of farmed countryside

Land under priority ELS options	⇧	Increase in area of land being managed in ways to enhance resilience.



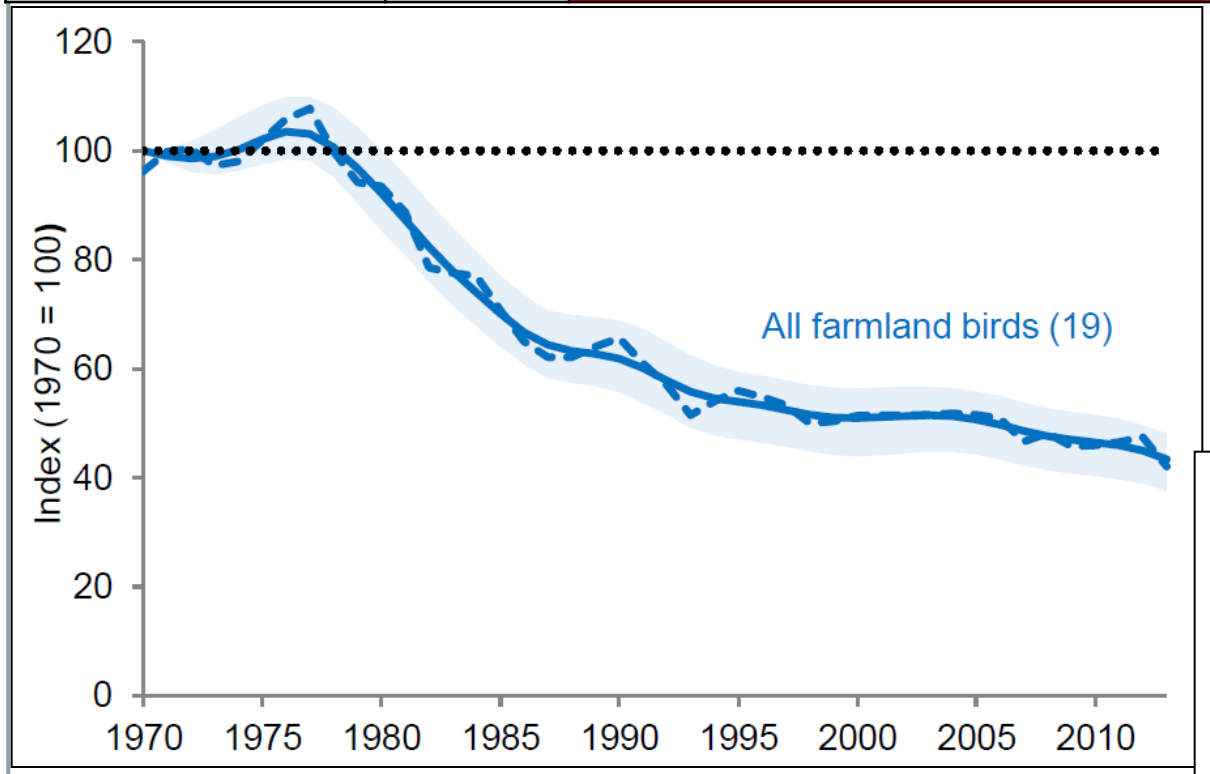
Notes: Uptake figures is the cumulative area assessed in March of the year shown.

- High priority ELS options have been identified for helping to reverse decline in wildlife such as farmland birds, enhancing the resilience of soils and water and contributing to climate change adaptation and mitigation.
- In 2014, 1.6 million ha of land were under these priority options, accounting for 17% of available farmland in England.
- This had increased by 44%, from 479,000 ha in 2011.

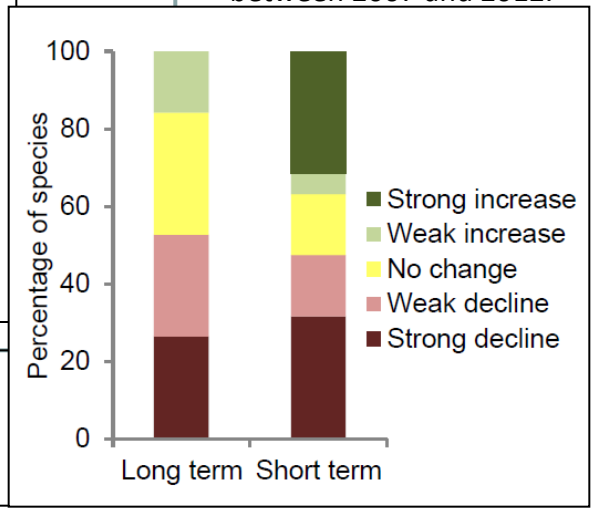
Source: Defra (2014) Biodiversity 2020 Indicators, p178

1e. Ecological condition of farmed countryside

Breeding birds on farmland	⇩	Long term and short term declines.



- Breeding birds on farmland have been monitored since 1970 with the average population size data available for 19 species.
- In 2013, the index reached its lowest recorded level, 56% lower than in 1970.
- The largest declines occurred between the late 1970s and early 1990s, however there has been a significant decline of 7% between 2007 and 2012.

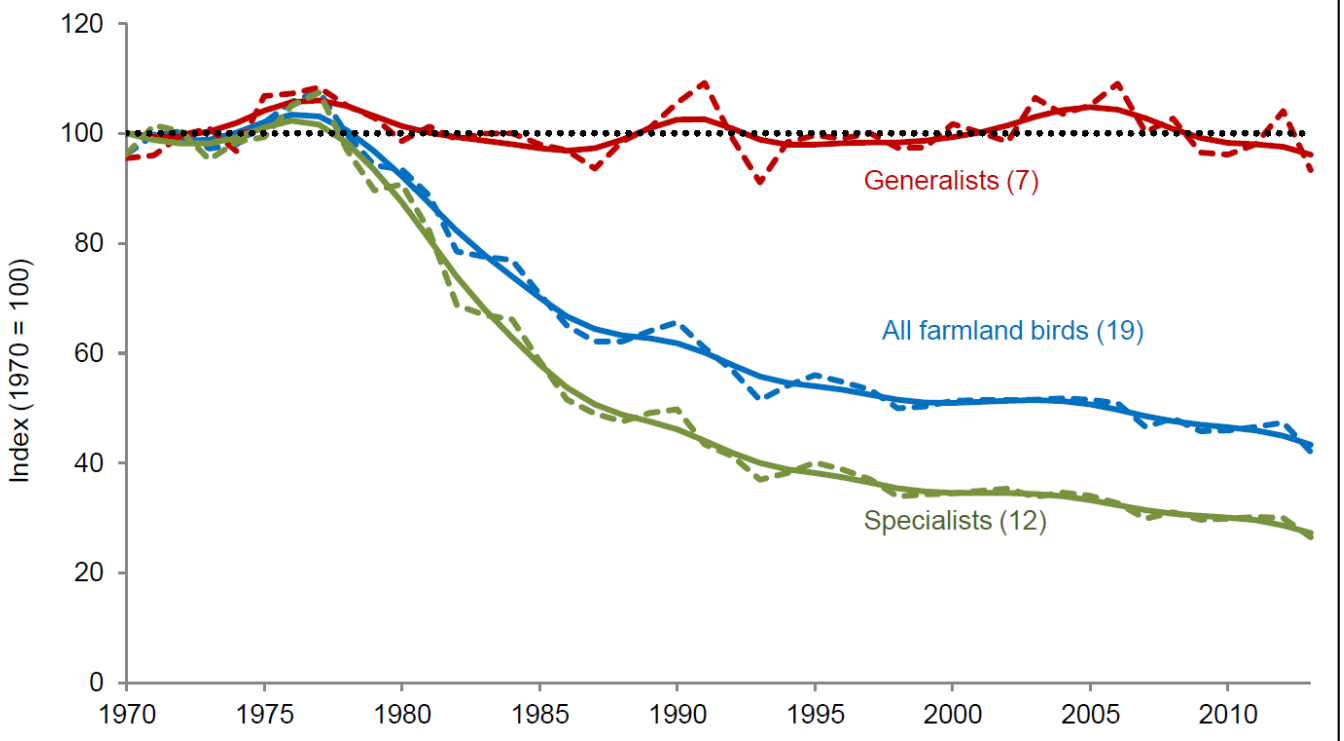


Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

Source: Defra (2014) Biodiversity 2020 Indicators, p61

1e. Ecological condition of farmed countryside

Farmland bird index – specialists & generalists	⇩	Decline in specialists is driving overall decline, with resulting loss in diversity and resilience.



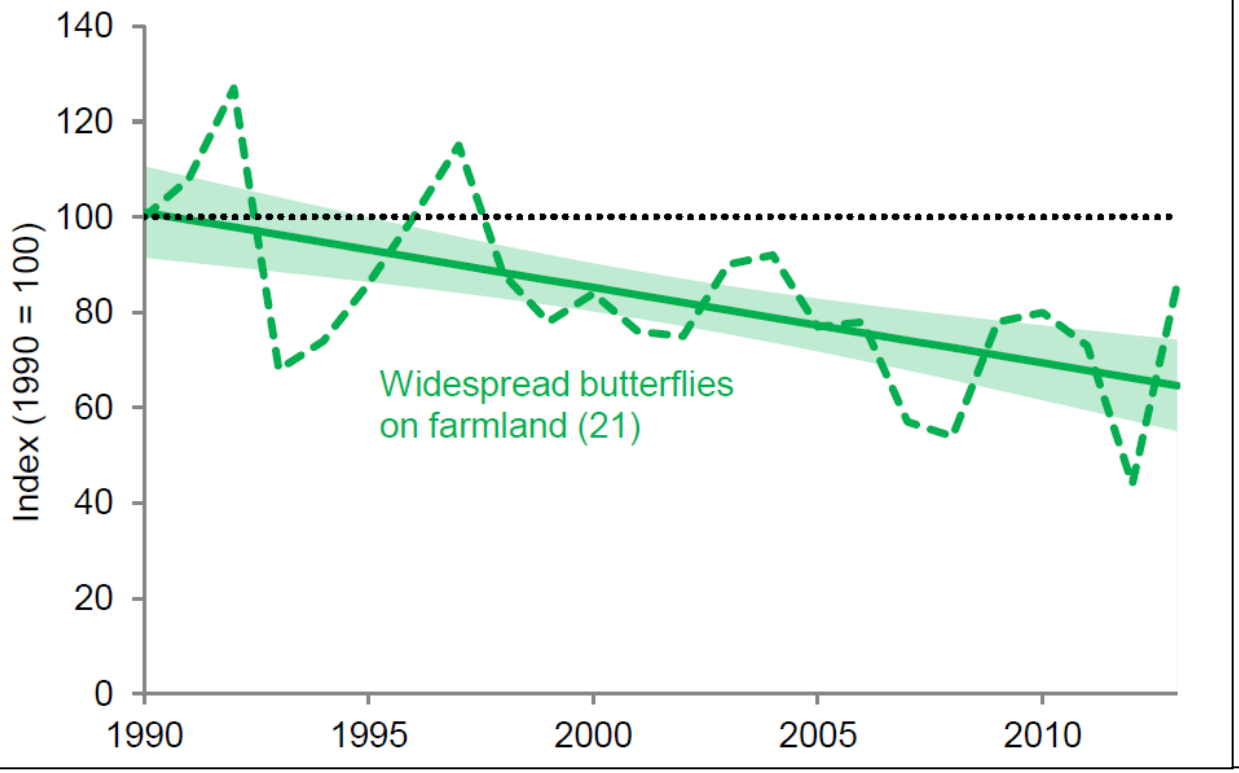
Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

- The long-term decline of farmland birds in England has been driven mainly by the declines in those species restricted to or highly dependent on farmland habitats (the specialists).
- Changes to farming practices, such as the loss of mixed farming systems, the move from spring to autumn sowing and the use of pesticides have been demonstrated to have adverse consequences for specialist species such as the skylark and grey partridge.

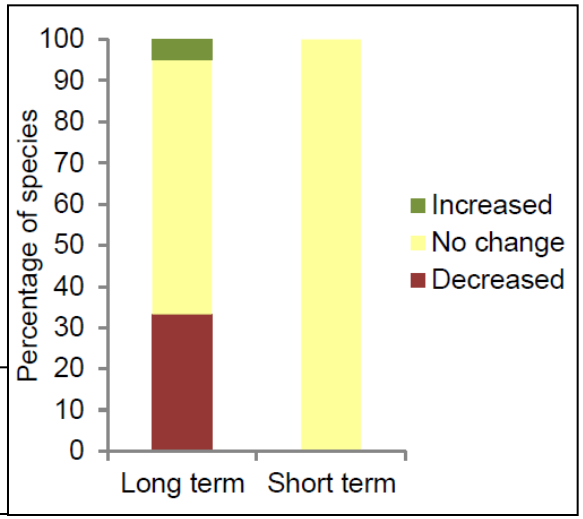
Source: Defra (2014) Biodiversity 2020 Indicators, p67

1e. Ecological condition of farmed countryside

Farmland butterfly index	⇩	Populations in decline since 2008, but with annual fluctuations.



- The average populations for 21 species of butterfly found on farmland habitats have been recorded since 1990.
- Since 1990, butterfly numbers have fallen by 14%, reaching a low point in 2012 but making a substantial recovery in 2013.
- These figures demonstrate how numbers fluctuate from year to year, but the indicator shows a significant decline since 2008.

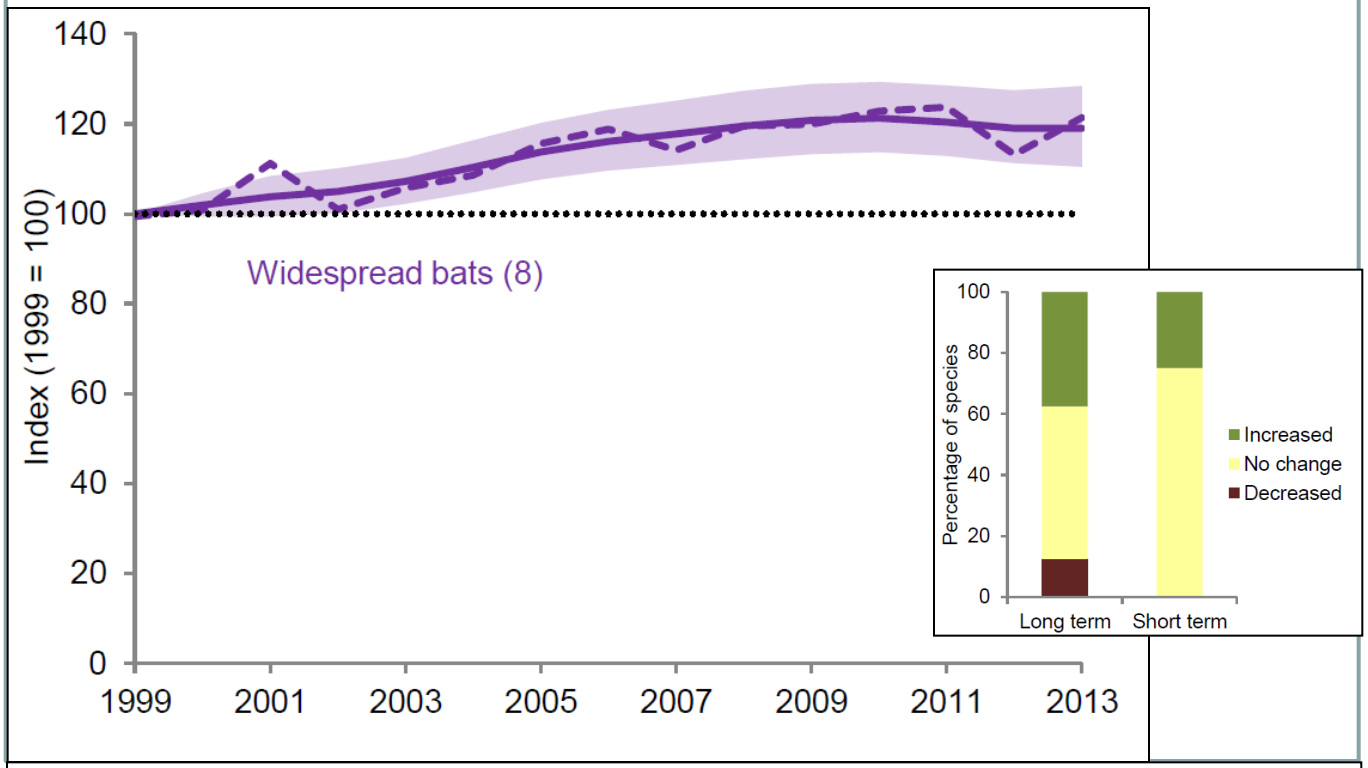


Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

Source: Defra (2014) Biodiversity 2020 Indicators, p62

1e. Ecological condition of farmed countryside

Farmland bat index	⇔	Improvements in species abundance, although stable in short term.



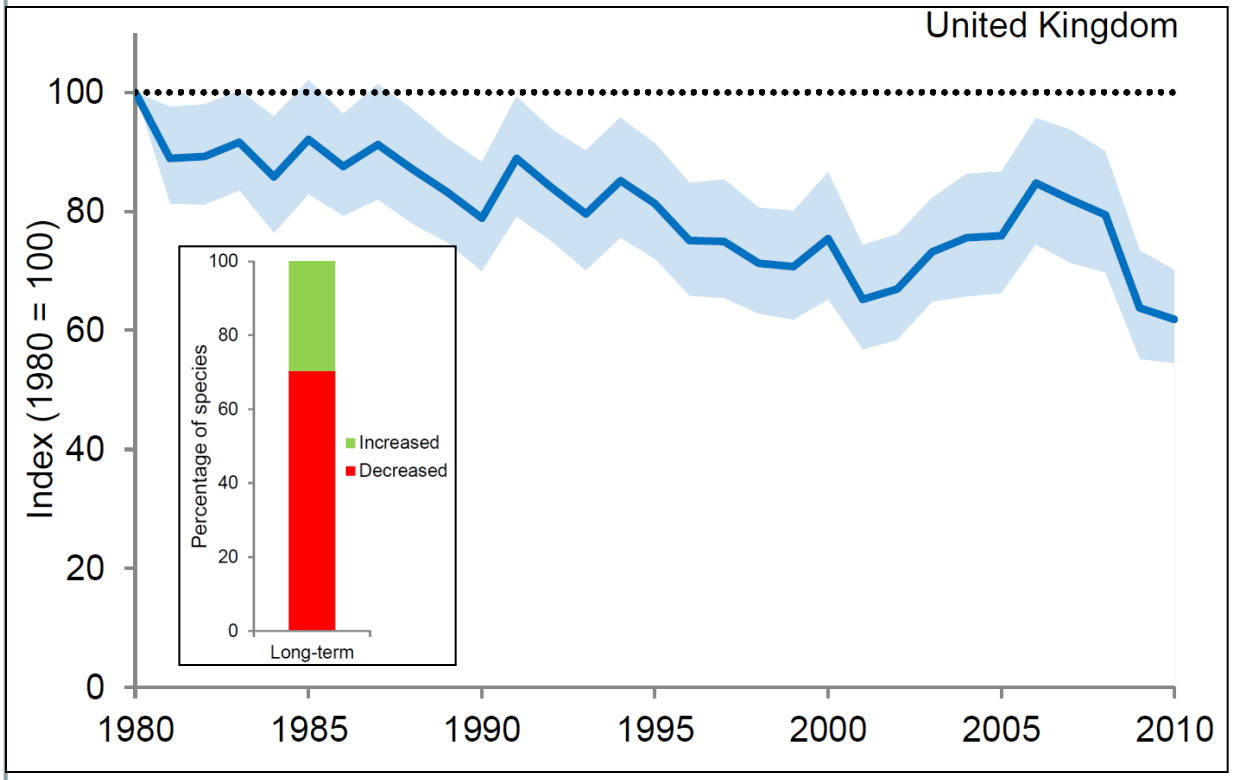
Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

- Average population size of 8 species of farmland bat have been recorded since 1999.
- Between 1999 and 2013 populations have increased by 22% which is a statistically significant increase.
- In the short-term between 2007 and 2012 the indicator has remained stable.
- The increase is attributed to conservation measures and milder winters.
- Bat populations have undergone significant declines historically. Data from colony counts of pipistrelle bats show a 60% decline in England from 1977 to 1999.

Source: Defra (2014) Biodiversity 2020 Indicators, p63

1e. Ecological condition of farmed countryside

Bee species occupancy	⇩	Long-term and short-term declines with adverse implications for pollination.



Notes: Based on 216 species of bee. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species that increased or decreased since 1980.

- Indicator illustrates changes in bee species occupancy between 1980 and 2010 for 216 species, the vast majority of bee fauna in the UK.
- In 2010 the relative occupancy was 62% of its 1980 value. The lowest point was 65% in 2001, which was followed by a recovery with the index reaching 85% of 1980 level in 2006.
- This was followed by a rapid decline to 2010. 70% of species recorded declined between 1980 and 2010.
- Inter-annual variability is due to variation in weather conditions, as bees respond positively to temperature and negatively to rainfall.

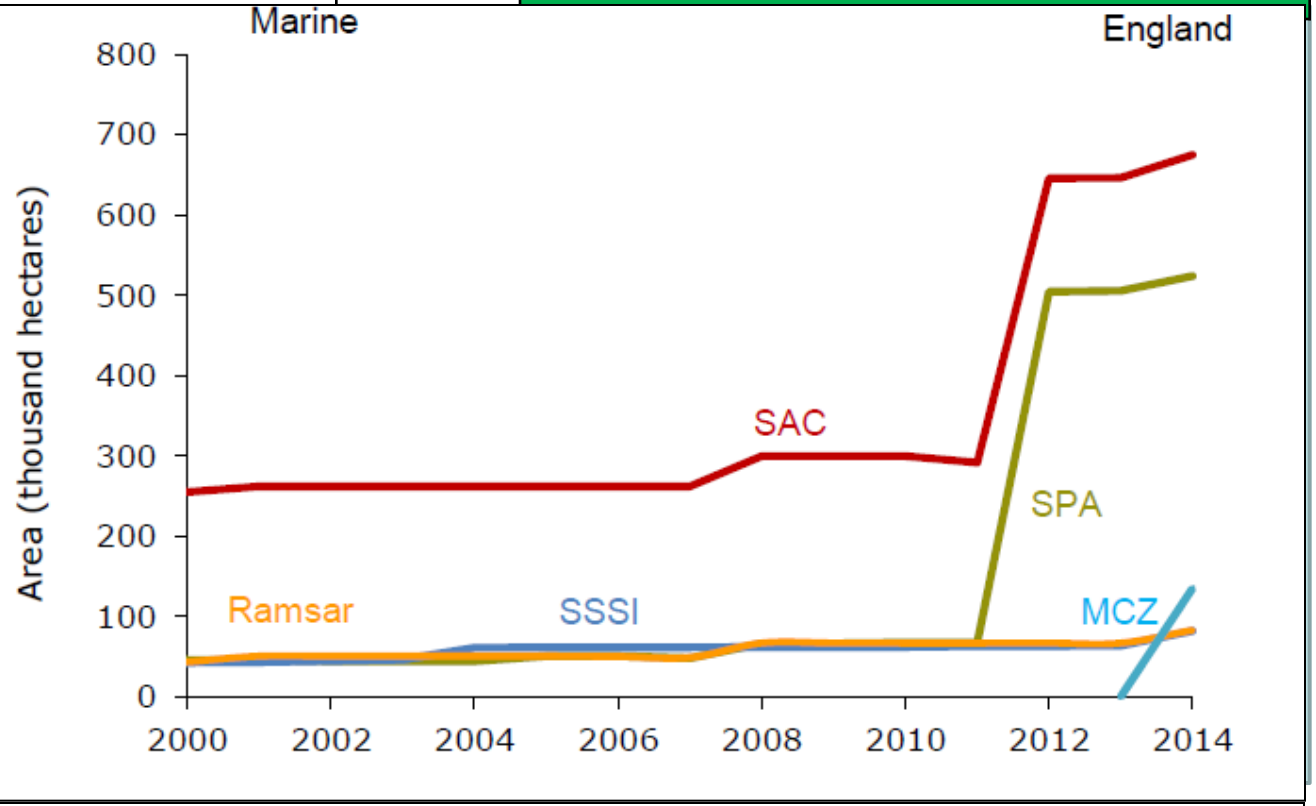
Source: Defra (2014) Biodiversity 2020 Indicators, p103

1f. Ecological condition of marine environment

Measure	Data series	Source	Trend	Implication
Extent of marine protected areas	2000-2014	Defra	⇧	Substantial marine designation programme has been delivered in last few years.
Levels of marine pollution	1990-2010	Defra	⇩	Sustained reduction in hazardous substances being inputted to marine environment.
Proportion of fish stocks managed sustainably	1990-2012	Defra	⇔	Progressive increase in proportion of stocks being managed sustainably, but still more than 50% are not.
Change in population of seabirds	1986-2014	Defra	⇔	Long-term increase in overall populations, although declines in some populations recently.

1f. Ecological condition of marine environment

Extent of marine protected areas	⇧	Substantial marine designation programme has been delivered.



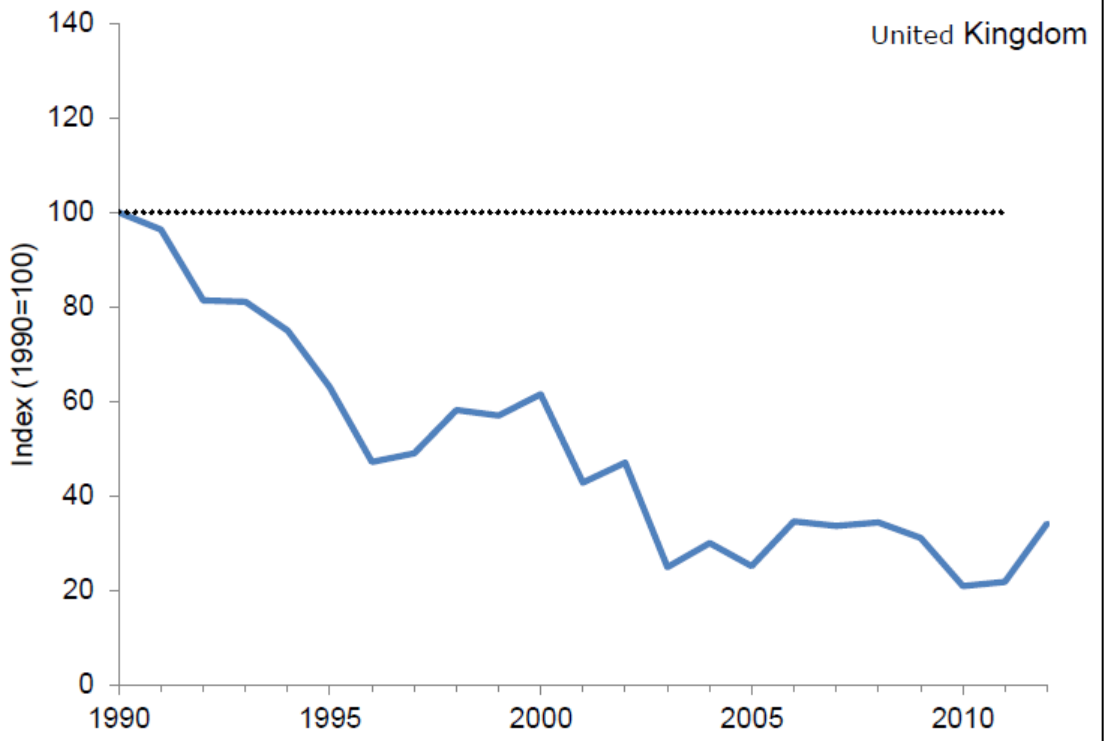
Notes: Extent of protected areas is cumulative area assessed in April of year shown. Marine sites between mean low water mark and the 12 mile limit are included. Sites beyond the 12 mile limit are excluded. These are included in the UK indicator of protected sites.

- The area of marine protected sites (out to 12 mile nautical limit) has increased substantially by more than 276% to 1.1 million ha between 2010 and 2014, representing 21% of England's in-shore waters.
- A large contribution to this has been the designation of in-shore marine sites through the EU Birds (SPA) and Habitats (SAC) Directives.
- In 2013, the Government also designated 27 Marine Conservation Zones (150,000 ha in-shore waters) under the Marine and Coastal Access Act.

Source: Defra (2014) Biodiversity 2020 Indicators, p20

1f. Ecological condition of marine environment

Input of hazardous substances	⇩	Sustained reduction in hazardous substances being inputted to marine environment.



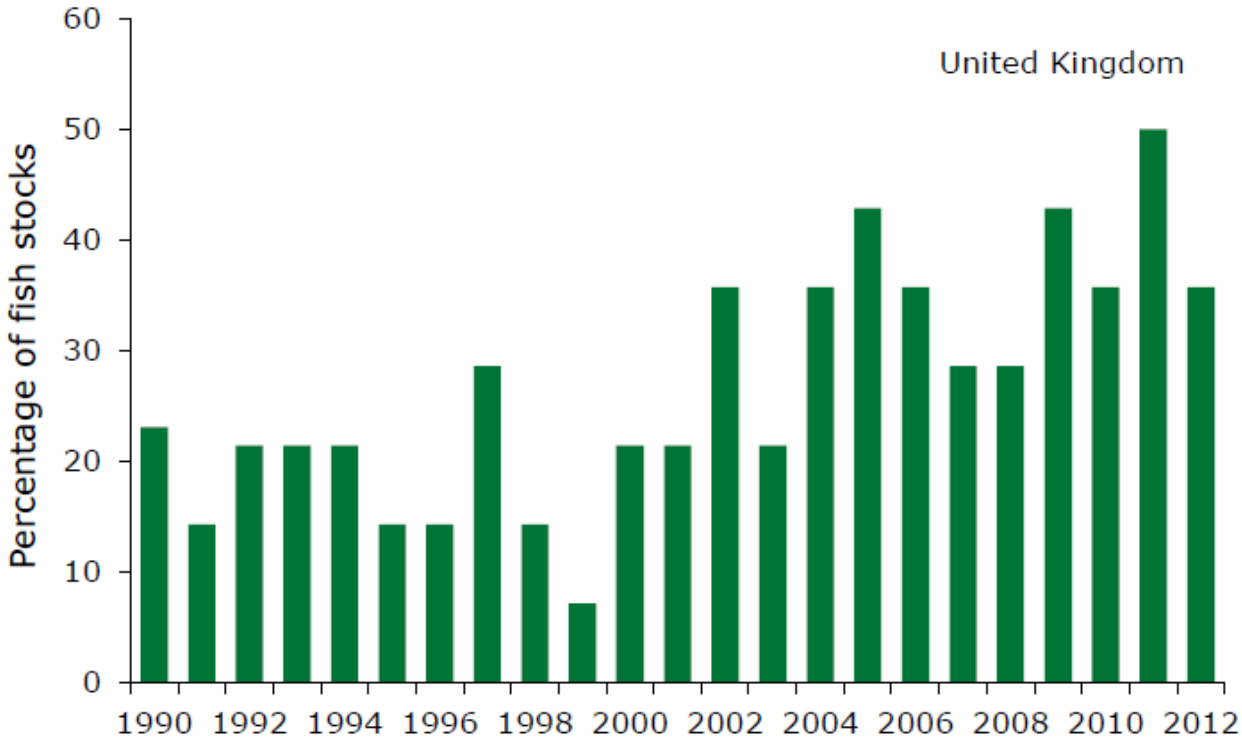
Notes: Index shows changes in relative input of six of the most hazardous substance to the marine environment: cadmium., lead, mercury, copper, zinc and lindane.

- In 2012, the combined index was 62% lower than in 1990.
- In the short-term, the index showed no significant change (2007-2012).
- Levels of all six substances declined over the time period. Inputs of three (mercury, cadmium and lindane) declined by more than 70%, whereas lead only declined by 7%.
- Inputs are estimated based on concentrations and flow rates from rivers. Flow rates are heavily affected by rainfall patterns, with high flows increasing inputs to the marine environment.

Source: Defra (2014) Biodiversity 2020 Indicators, p154

1f. Ecological condition of marine environment

Proportion of fish stocks managed sustainably	⇔	Progressive increase in proportion managed sustainably, but still more than 50% are not.



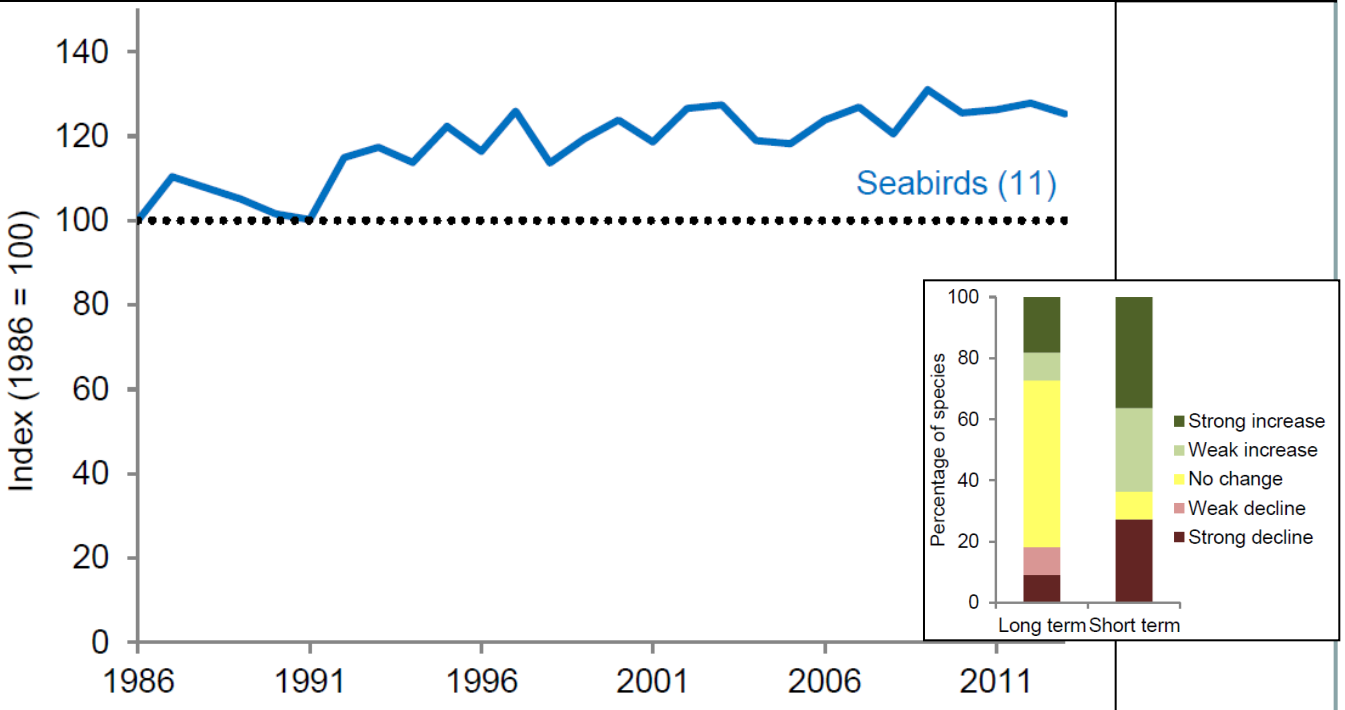
Notes: Based on a group of 6 species in 14 stocks for which there are reliable estimates of fishing mortality and spawning biomass. Together, these species represent fish stocks of major importance to the UK fishing industry.

- Indicator shows the percentage of fish stocks in seas around the UK that are harvested sustainably and are at full reproductive capacity.
- The proportion of assessed fish stock harvested sustainably was between 7% and 29% between 1990 and 1999, rising to between 21% and 50% since 2000.

Source: Defra (2014) Biodiversity 2020 Indicators, p180

1f. Ecological condition of marine environment

Change in population of seabirds	⇔	Long-term increase in overall populations, although declines in some populations more recently.



Notes: Figures in brackets show the number of species. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded). Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

- Population levels of 11 species of seabird around England's coast have been monitored since 1986.
- In 2013, the index was 25% higher than the baseline level in 1986. The index has shown a smaller increase of 4% in the short-term, between 2008 and 2013 although this is not considered significant.
- Surface feeders (e.g. terns) have fared less well than sub-surface feeders (e.g. shags, gannets). Gannet numbers have increased 17-fold over the period.

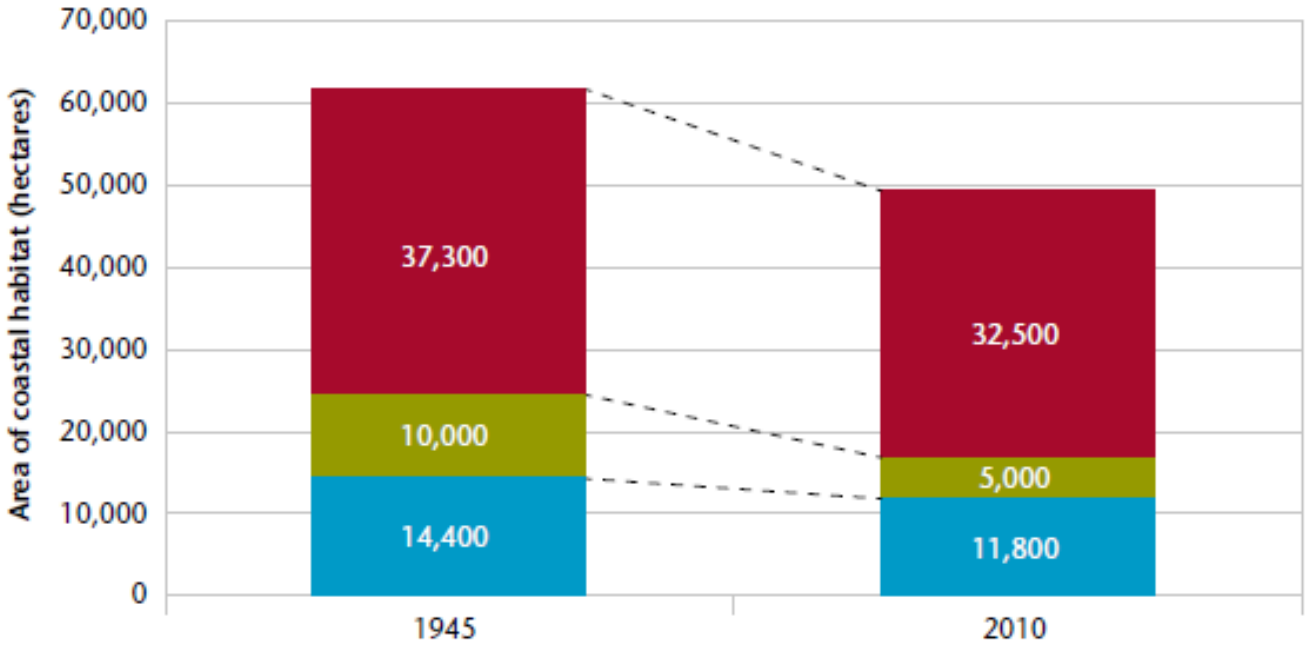
Source: Defra (2014) Biodiversity 2020 Indicators, p94

2. Extent of priority habitats

Measure	Data series	Source	Trend	Implication
Change in extent of coastal habitats	1945-2010	UK National Ecosystem Assessment	⇩	Reduction of 20% mainly due to historic development and land-use.
Delivery of managed realignment	2000-2012	Environment Agency	⇔	Over 100km of coastline delivered, but five-fold increase required to meet SMP goals.
Creation of compensatory inter/supratidal habitat in coastal areas	2008-2013	Environment Agency	N/A	Current plans are insufficient to deliver enough new habitat to compensate for projected losses by mid-2020s.
Creation of compensatory wetland habitat in coastal areas	2008-2013	Environment Agency	N/A	Current plans should deliver more than enough compensatory wetland habitat.

2. Extent of priority habitats

Change in coastal habitat extent	⇩	Reduction of 20% mainly due to historic development and land-use.



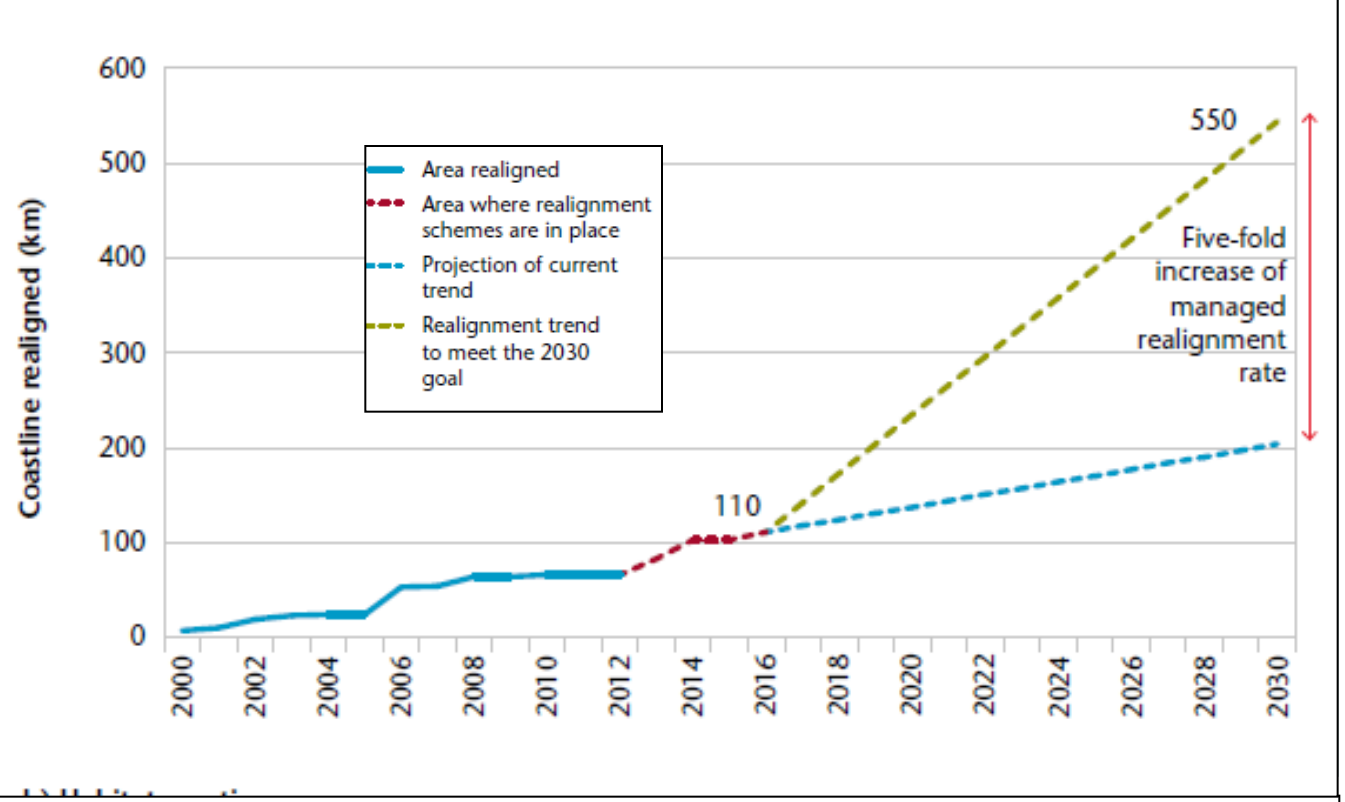
Notes: Adapted from UK National Ecosystem Assessment (2011b) quoting Jones et al. (1993) and Delbaere (1998) for sand dunes and Morris et al. (2004), Doody (2008) and Cooper et al. (2001) for saltmarsh

- Coastal habitats have declined in extent by 20% from 1945 levels, a loss of around 13,000 ha.
- Shingle beaches incurred the largest relative loss (50%), due to infrastructure development such as power stations or industrial plants, dredging and shorefront development and promenades.
- Sand dune losses (18%) were mainly due to development of housing, tourism, golf courses, agricultural land claim and, in some places, afforestation.
- Saltmarsh has declined by about 13% due to reclamation for agriculture or development.
- Natural processes of saltmarsh colonisation and dieback have in the past varied over time and according to location, for example accretion in the Wash and Northwest of England and extensive dieback in the estuaries of Essex and the south coast.
- Sea-level rise of around 10 cm since 1900 is thought to only have been responsible for around 2% of sand dunes losses and 4.5% of saltmarsh losses.

Source: ASC (2013), page 96

2. Extent of priority habitats

Delivery of managed realignment	⇔	Over 100km of coastline delivered, but five-fold increase required to meet SMP goals.



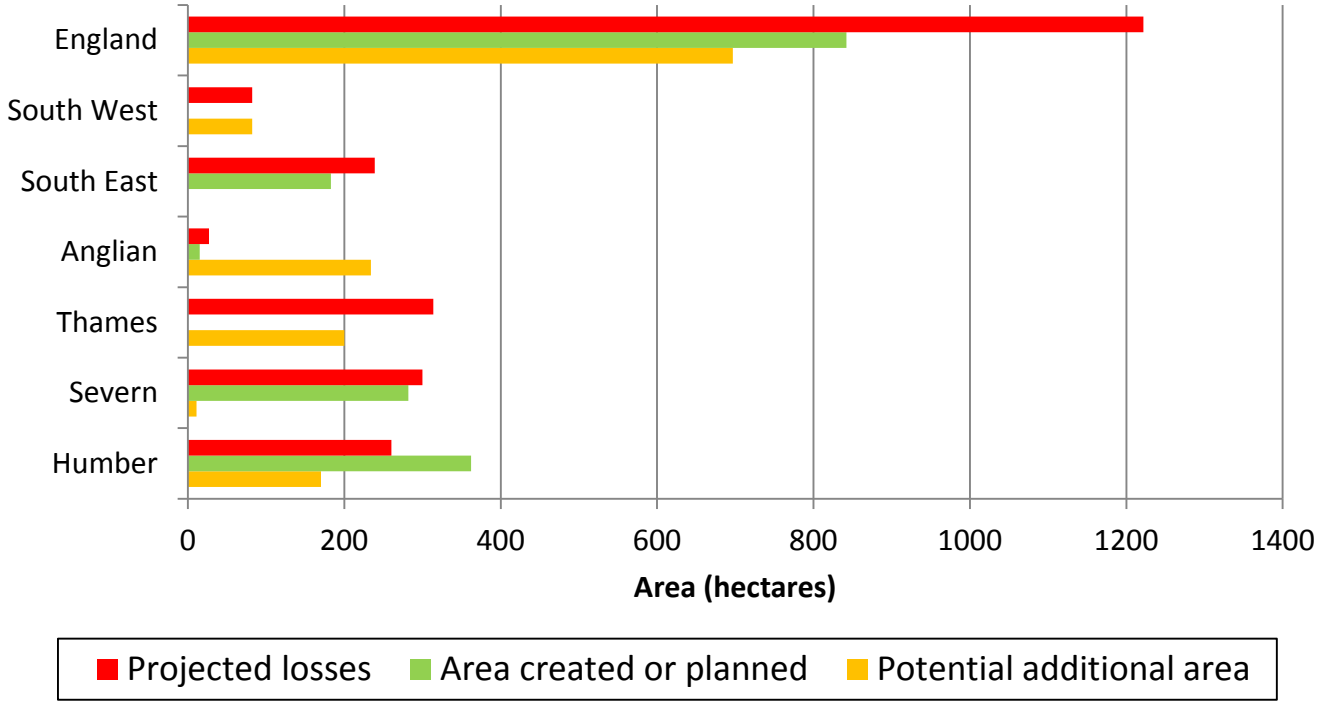
Notes: from ABPmer managed realignment database (2013) and area of managed realignment schemes planned to 2016 (high and medium confidence) provided by the Environment Agency.

- Managed realignment allows coastal habitats to respond naturally to sea level rise by removing barriers to inland migration.
- Managed realignment can help limit the projected long-term increase in the cost of coastal defences.
- Shoreline Management Plans propose setting back nearly 10% of the coastline by 2030, rising to nearly 15% by 2060.
- Achieving this goal would mean realigning around 30 km of coastline every year to 2030.
- The rate of realignment would have to increase five-fold from the current level of around 6 km every year.

Source: ASC (2013)

2. Extent of priority habitats

Creation of compensatory habitat – intertidal/supratidal	N/A	Current plans are insufficient to deliver enough new habitat to compensate for projected losses by mid-2020s.



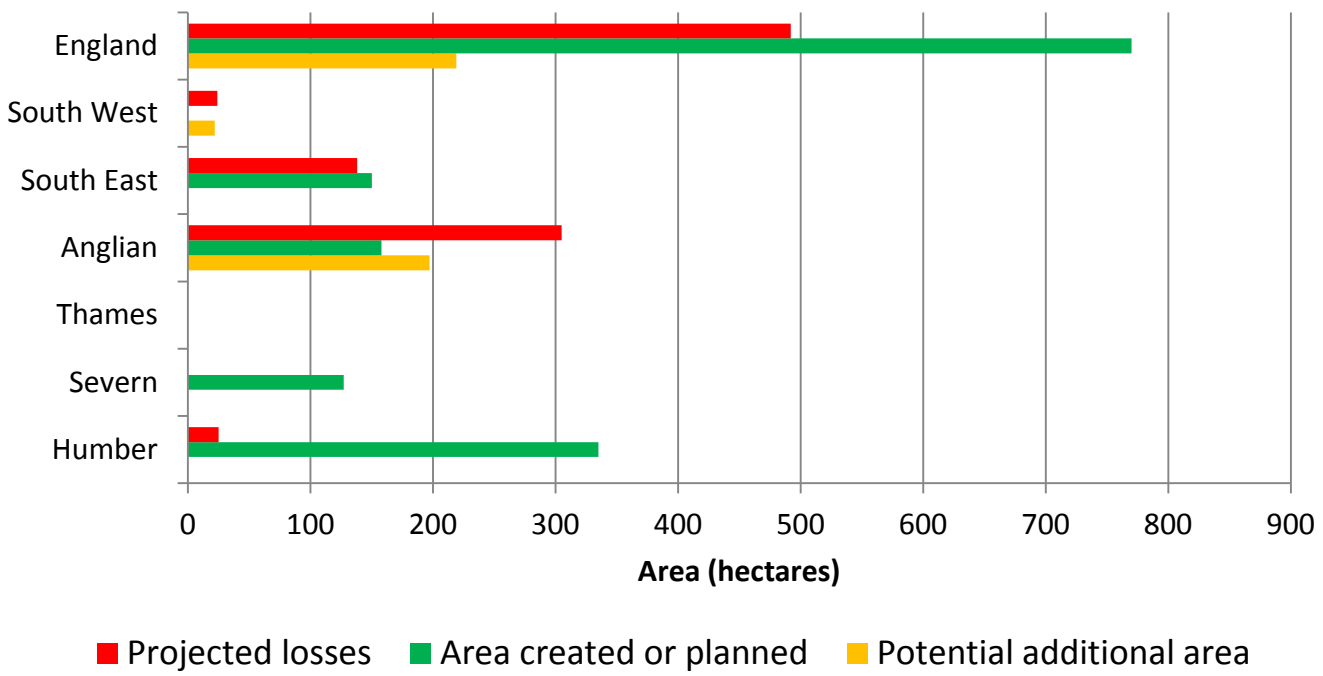
Notes: Projected losses is the area of inter/supratidal habitat that the Environment Agency estimates will be lost due to coastal squeeze by the mid-2020s. The potential additional area is habitat that may be created in the future, but plans or agreements are not currently in place for delivery.

- Habitat Regulations require the creation of compensatory habitat for losses to European sites caused by human activity.
- Coastal habitats are directly at risk from sea level rise and coastal change, particularly when they are unable to move landwards due to the presence of hard structures such as flood defences. This process is called 'coastal squeeze'.
- The Environment Agency is responsible for identifying and co-ordinating the delivery of new habitat creation to compensate for losses caused by coastal squeeze.
- By 2013, the Agency had delivered, or was on course to deliver, sufficient new inter-tidal habitat to compensate for around two-thirds of the projected losses.

Source: Environment Agency (2013*) National annual review of habitat creation programmes*

2. Extent of priority habitats

Creation of compensatory habitat - wetlands	**N/A**	Current plans should deliver more than enough compensatory wetland habitat.



Notes: Projected losses is the area of wetland (freshwaher) habitat that the Environment Agency estimates will be lost due to coastal squeeze by the mid-2020s. The potential additional area is habitat that may be created in the future, but plans or agreements are not currently in place for delivery.

- Habitat Regulations require the creation of compensatory habitat for losses to European sites caused by human activity.
- Coastal habitats are directly at risk from sea level rise and coastal change, particularly when they are unable to move landwards due to the presence of hard structures such as flood defences. This process is called 'coastal squeeze'.
- The Environment Agency is responsible for identifying and co-ordinating the delivery of new habitat creation to compensate for losses caused by coastal squeeze.
- By 2013, the Agency had delivered, or was on course to deliver, nearly double the amount of new habitat required to compensate for projected losses.

Source: Environment Agency (2013) *National annual review of habitat creation programmes*

3. Coherence of ecological networks

Measure	Data series	Source	Trend	Implication
Area covered by landscape-scale initiatives	?	?	?	The area of land covered by various landscape-scale initiatives is available, but there is no time series data.
Habitat connectivity in wider countryside	?	?	?	Defra is in the process of developing an indicator.

Adaptation Sub-Committee

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