

# Environmental Impacts and Rural Livelihoods

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Innovation for Sustainable  
Sheep and Goat  
Production in Europe

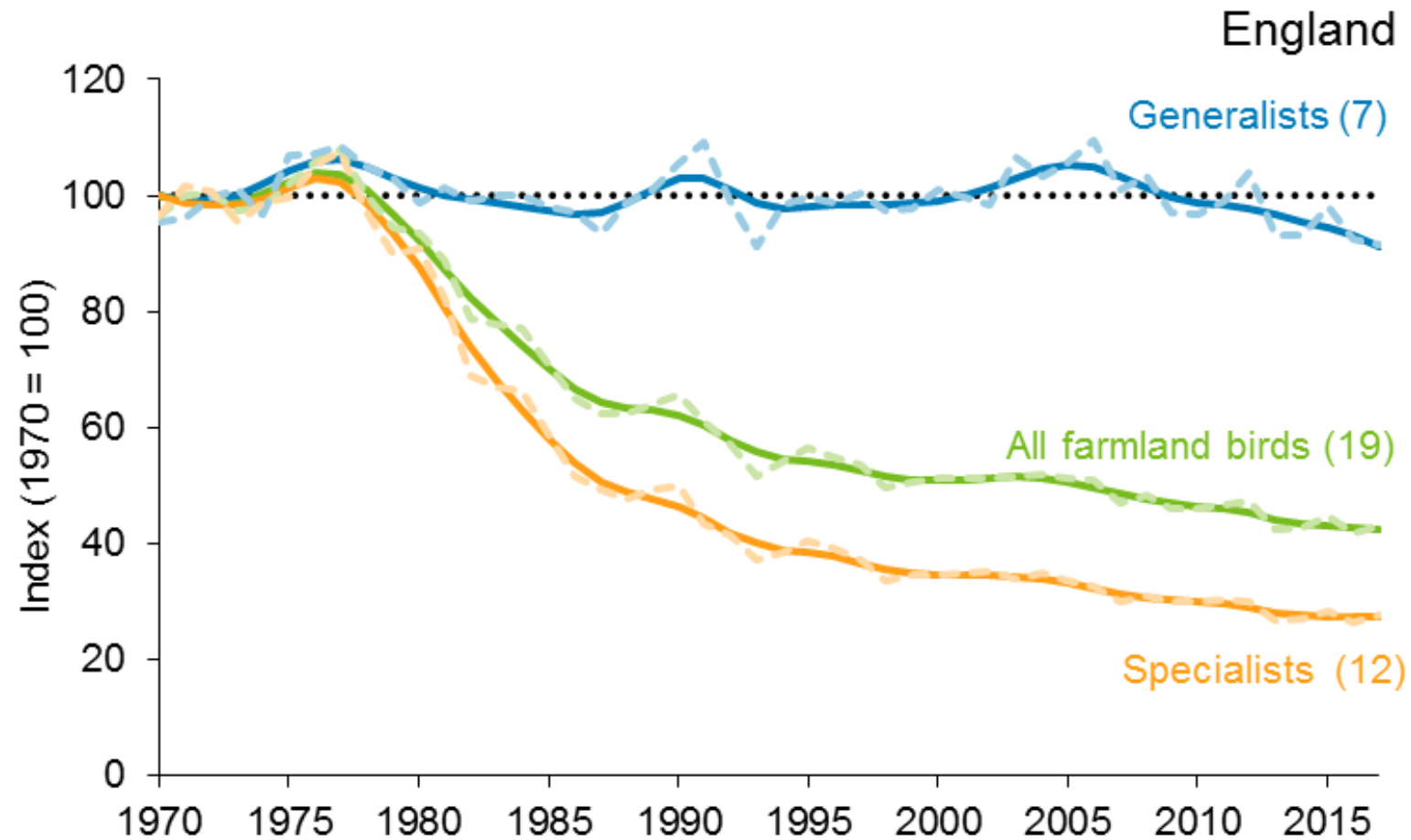
# Current Support under CAP

1. Direct Payments under 'Pillar I' (€3.1 billion in the UK in 2016),
  1. Basic Payment Scheme (BPS)
  2. 'Greening' component which is 30% of the Direct Payment total
  3. Young Farmers Scheme
2. Also under Pillar I, mostly market management measures.
3. 'Pillar II' (€0.8 billion in 2016), is for rural development schemes which include agri- environmental measures.

# Health and Harmony: the future for food, farming and the environment (UK Government February 2018)

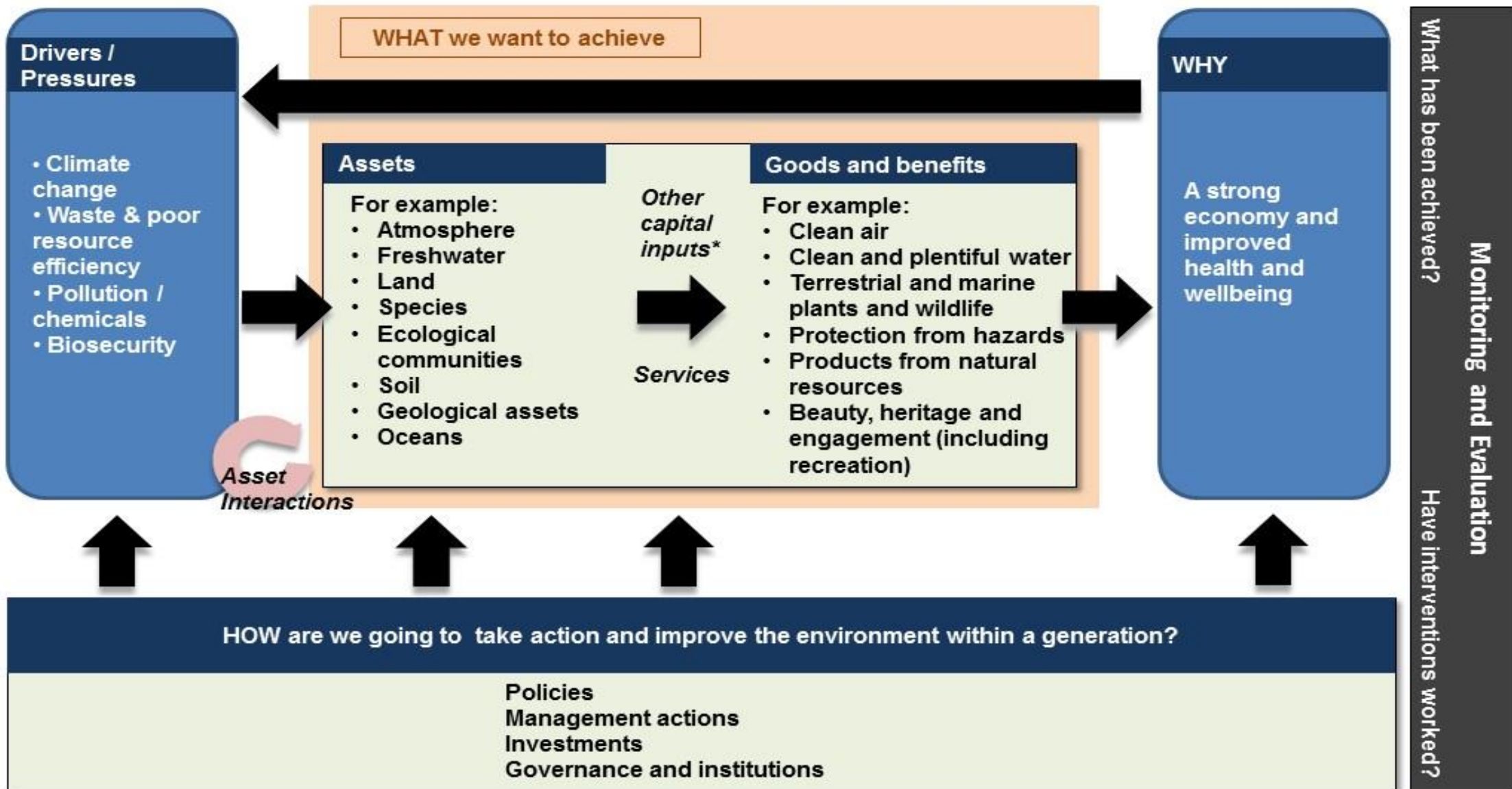
- payment of public money for the provision of public goods.
- goals set out in the 25 Year Environment Plan
- pays providers for delivering environmentally beneficial outcomes;
- deliver benefits such as improved air, water and soil quality; increased biodiversity; climate change mitigation and adaptation

## Populations of specialist and generalist farmland birds in England, 1970 to 2017



British Trust for Ornithology, Defra, Joint Nature Conservation Committee, Royal Society for the Protection of Birds.

# A framework for improving the environment



\*Other capital inputs include manufactured capital (eg. buildings and machines), human capital (eg. labour and education) and social capital (eg. rules and procedures)

# UK Government 25 yr Environment Plan

(updated May 2019)

- restoring 75% of our one million ha of terrestrial and freshwater protected sites to favourable condition
- creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network
- taking action to recover threatened, iconic or economically important species of animals, plants and fungi
- **ensuring that food is produced sustainably and profitably**

# 25 yr Plan - Woodland

- increasing woodland in England in line with our aspiration of 12% cover by 2060: this would involve planting 180,000 hectares by end of 2042.
- Last year 13,400 (mainly Scotland, 11,000)

But uprated

- Committee on Climate Change - 1.5bn trees would be needed by 2050 as part of zero C,
- equivalent to an area of 30,000 hectares every year, with 15% of ***crop land*** turned to tree-planting and growing plants for fuel by 2050

# Government Policy - Biodiversity

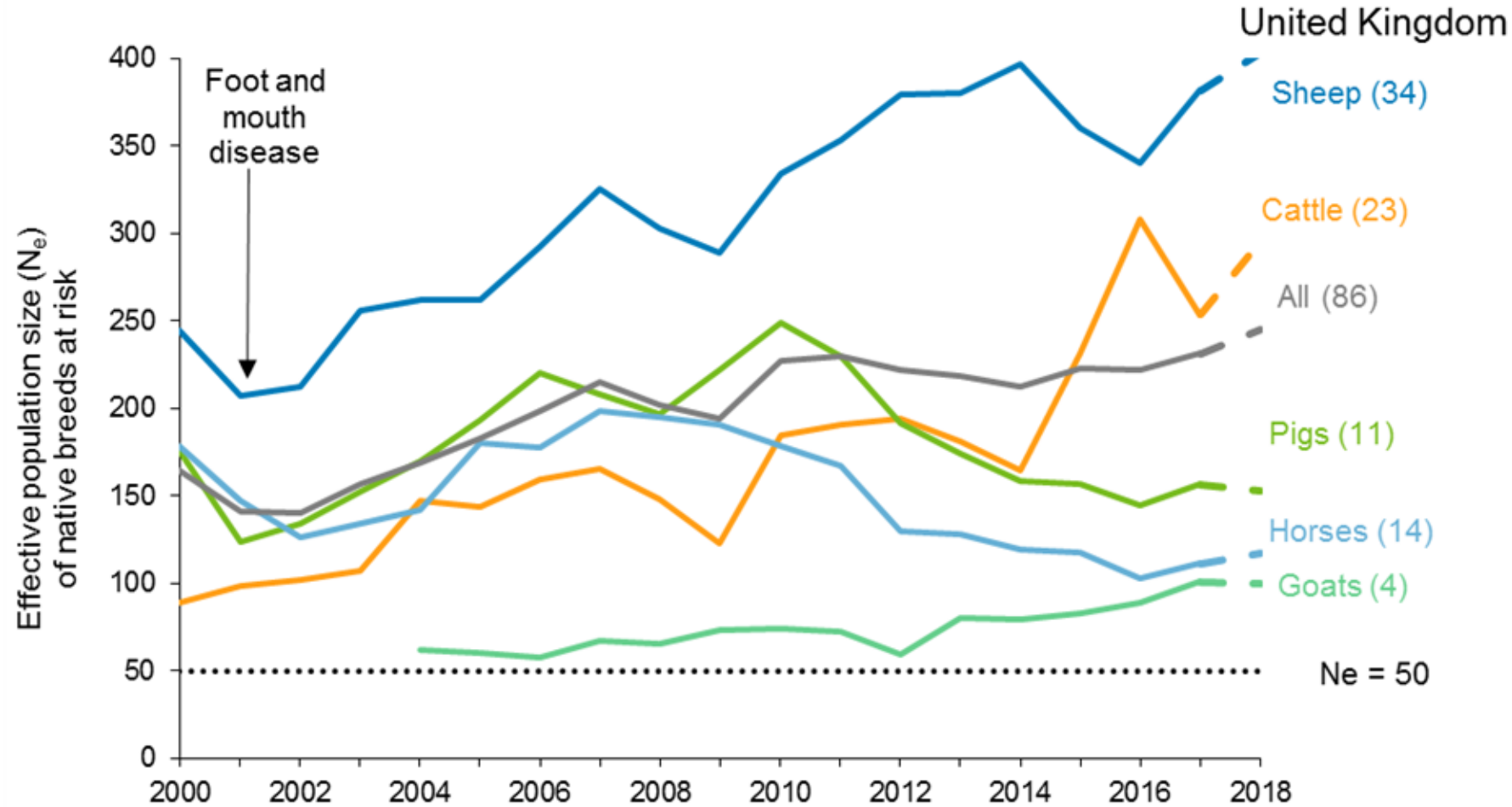
- In 2011, the government published *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*. Set Strategic Direction
- *Biodiversity 2020 Indicators* published assessments of progress on 24 indicators of biodiversity including those associated with farmland



# Biodiversity Assessment (Species in the wider countryside: farmland)

	Long Term	Short term
Breeding farmland birds	X	X
Butterflies	X	=
Bats	✓	✓
Plant diversity	Not assessed	Not assessed

Average effective population size ( $N_e$ ) of Native Breeds at Risk in the UK, 2000 to 2018

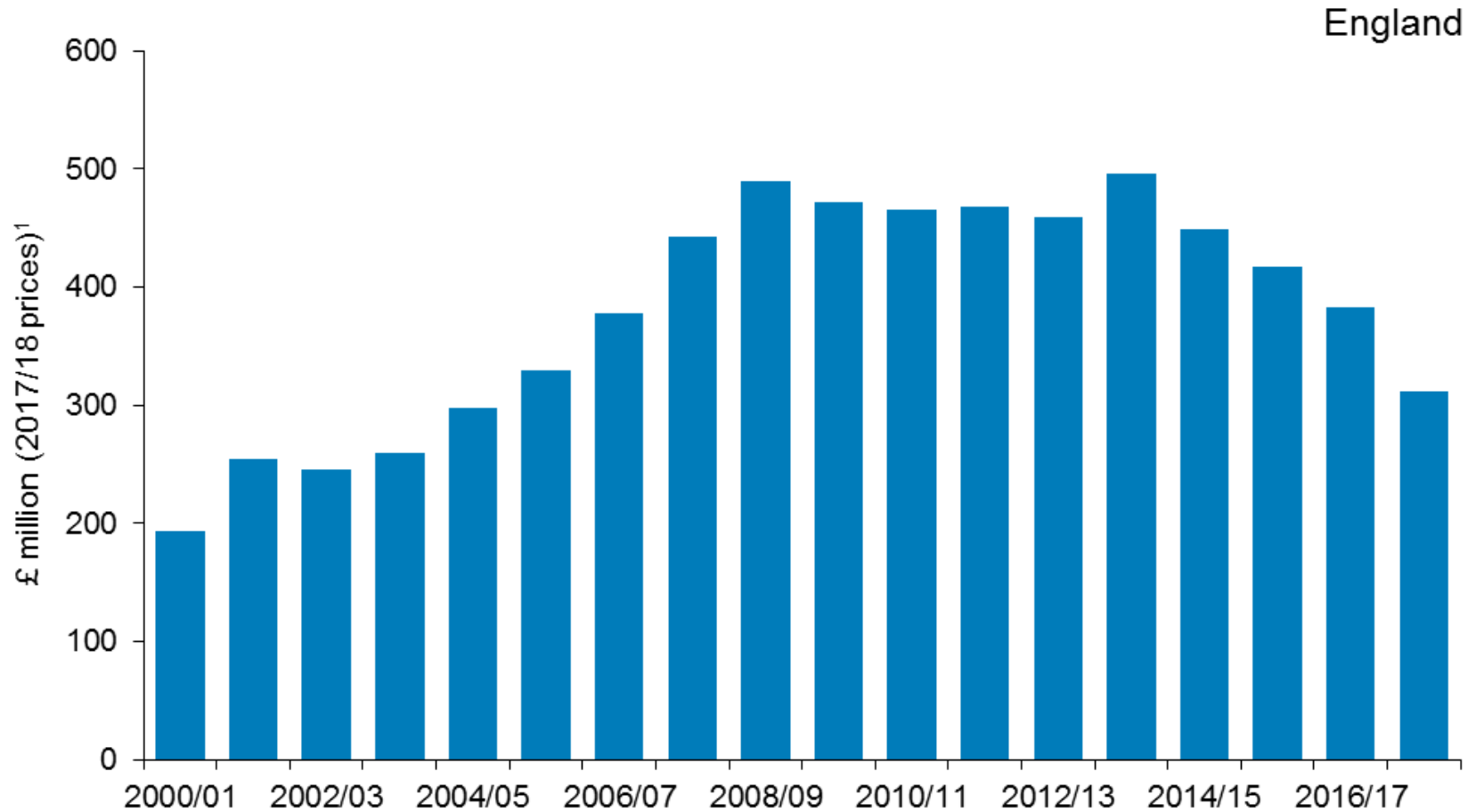


effective population size ( $N_e$ ) equal to 50; the level set by FAO as a threshold for concern.

## Breed variation

- 18 breeds have had an increase in Ne (for example, Boreray, Shropshire, Hebridean, and Castlemilk Moorit)
- 5 a decrease (Black Welsh Mountain, Border Leicester, Cotswold, Manx Loaghtan and Whitefaced Woodland),
- 2 breeds stable (Llanwenog a 1% decrease and Norfolk Horn a 5% increase).

**Public sector expenditure on biodiversity in England,  
2000/01 to 2017/18 (real terms)**



Management of Grassland is key  
to meeting environmental targets

**Grass/ Forage comprises 90 to 95%  
of the diet of sheep**

# UK grasslands

Total UK agricultural area is 17.5 million Ha

Grasslands comprise 12.4 million Ha (71% of total)

Of this

- 10% Temporary Grassland (<5yrs)
- 80% Permanent Grassland, of which
  - 60% is Grassland over 5 yrs and
  - 40% Single owner Rough Grazings
- 10% Common Rough Grazings

# Wide range of species composition

- Temporary grasslands- intensive single species
- Species rich meadows
- Permanent grasslands
- Rough grazings – semi natural



# Livestock Production

## Grasslands support production from

- 35 million Sheep
- 10 million Cattle
- 2 million Dairy Cows





# Grassland farms

- produce 36% of UK agricultural output amounting to £8 billion,
- have the greatest number of holdings and employ the largest number involved in agriculture (e.g. 31% of agricultural workforce in England).
- but have a high reliance on subsidy (over 90% of income from Direct Payments in beef/sheep)
- even so 66% of grazing LFA farms and 75% of lowland grazing had profits less than £25k per annum
- wide range in performance (ratio >2 between top and bottom 25%)

# Potential Strategies

## **Aim: Enhance environment within context of profitable farming**

- Increase efficiency on high potential pastures (same or increased output with fewer ha - how?) to release land for delivery of public goods (biodiversity/woodlands/ win-win GHG.)
- Greater incorporation of grassland into arable rotations
- Silvo-pastoral systems
- Improve management of grasslands to deliver biodiversity



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# The Opportunity (Mayne and O'Mara, 2018)

- Significant underutilization of UK grassland is costing the UK ruminant livestock sector in excess of £1600 m per annum  
- **this represents 50% of current subsidy support.**



# Silvo-pastoral systems - needs

- Practical research to demonstrate tangible operational and economic benefits and communication of these benefits to farmers;
- Providing the right policy and support mechanisms to facilitate new uptake; (Trees and Sheep initiative Scottish Forestry)
- Building a critical mass of farm innovators to demonstrate benefits to peers.

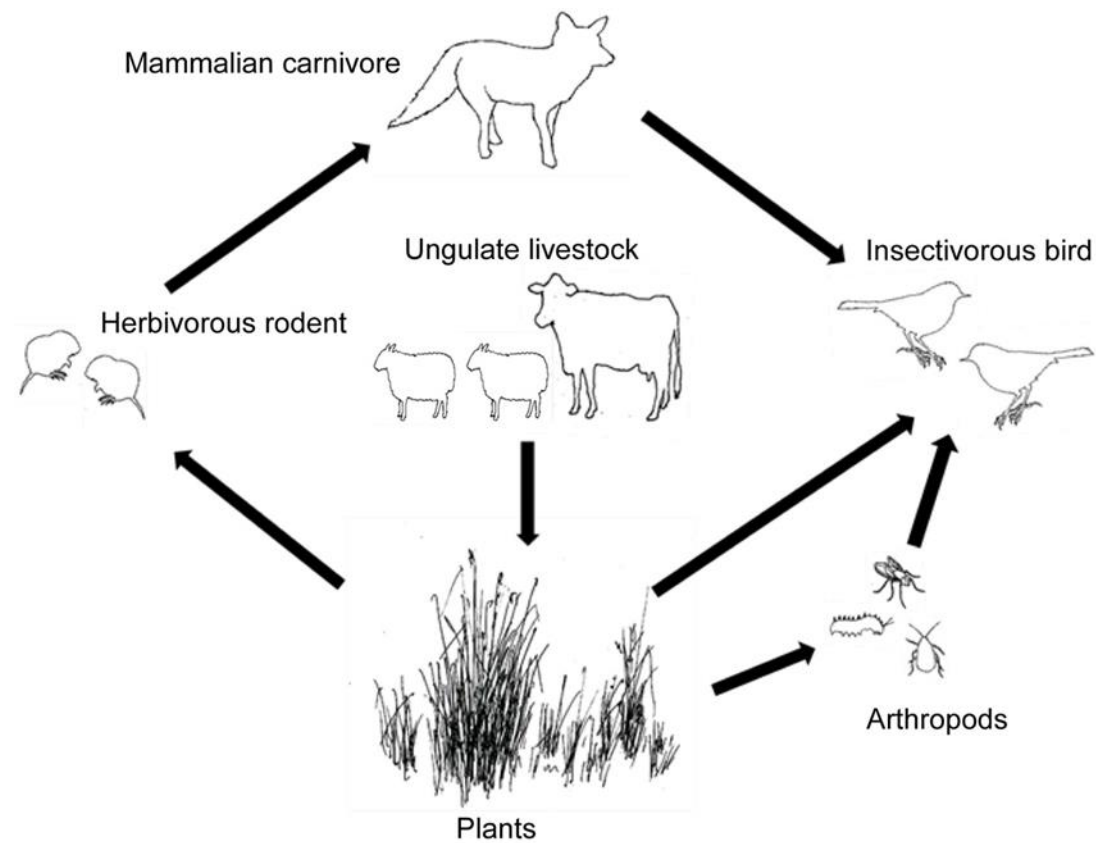
<https://www.adas.uk/News/the-potential-of-agroforestry-in-uk-agriculture>

Semi-natural rough grazing

More structural heterogeneity

Increased floristic diversity

Improved habitat value



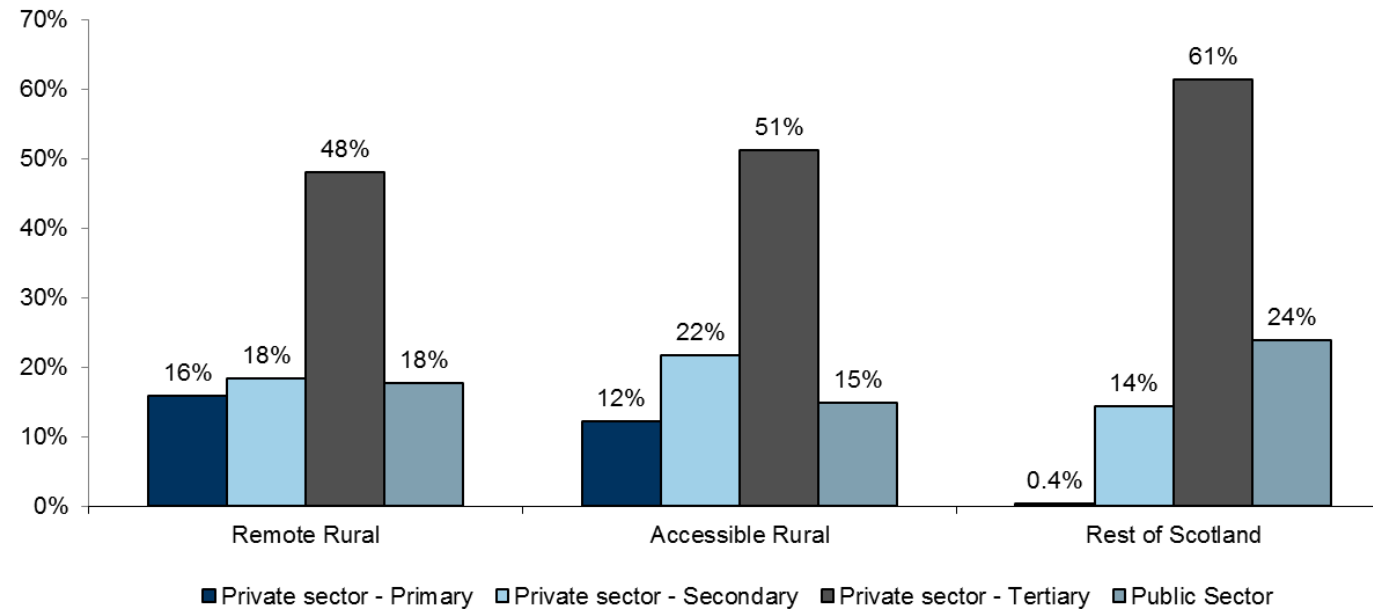
	TREATMENT			
	I	II	III	IV
Plants	Red	Yellow	Yellow	Green
Arthropods	Red	Yellow	Yellow	Green
Herbivorous rodent	Red	Orange	Yellow	Green
Insectivorous bird	Yellow	Orange	Green	Red
Mammalian carnivore	Red	Orange	Yellow	Green

- I = commercial sheep grazing (2.72 ewes ha<sup>-1</sup>)
- II= low intensity sheep grazing (0.91 ewes ha<sup>-1</sup>),
- III = low intensity mixed-herbivore grazing with equivalent off-take to treatment II
- IV = no grazing



# Contribution of livestock farming...

Deb Roberts  
James Hutton Inst



- Agriculture is relatively more important in remote rural areas but economies dominated by service sectors.
- Growth is increasingly dependent on sectors linked to natural environment e.g. tourism, renewables (underpinned by farming)
- High reliance on transfer (“unearned”) income from other areas e.g. pensions, non-local income, investments, public sector funding, **farm subsidies** and structural funds

# Multifunctional grasslands

## **They have potential through**

- better targeted support,
- new technology and innovative practices

## **To deliver**

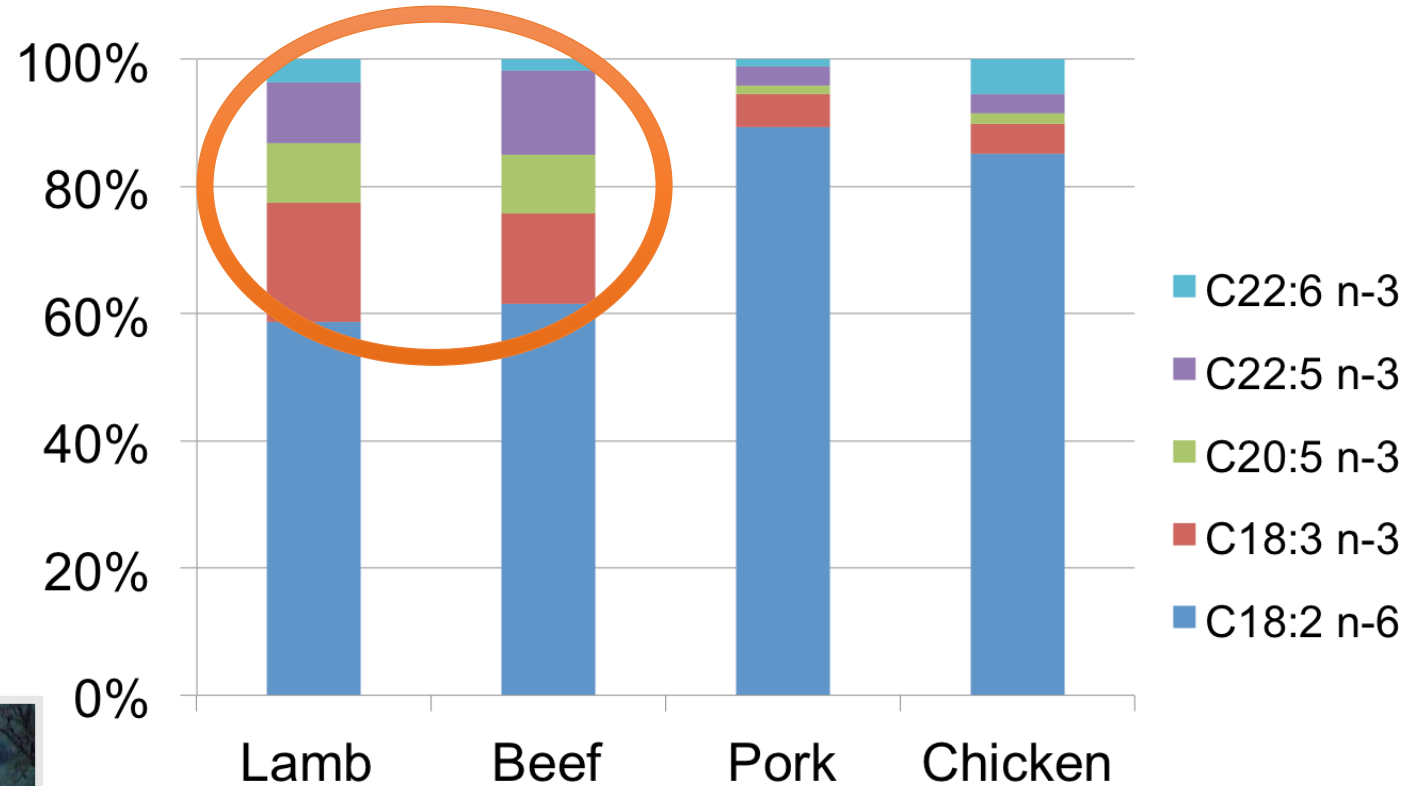
- a successful rural economy
- a healthy natural environment,
- improved productivity

THE END

THANKYOU

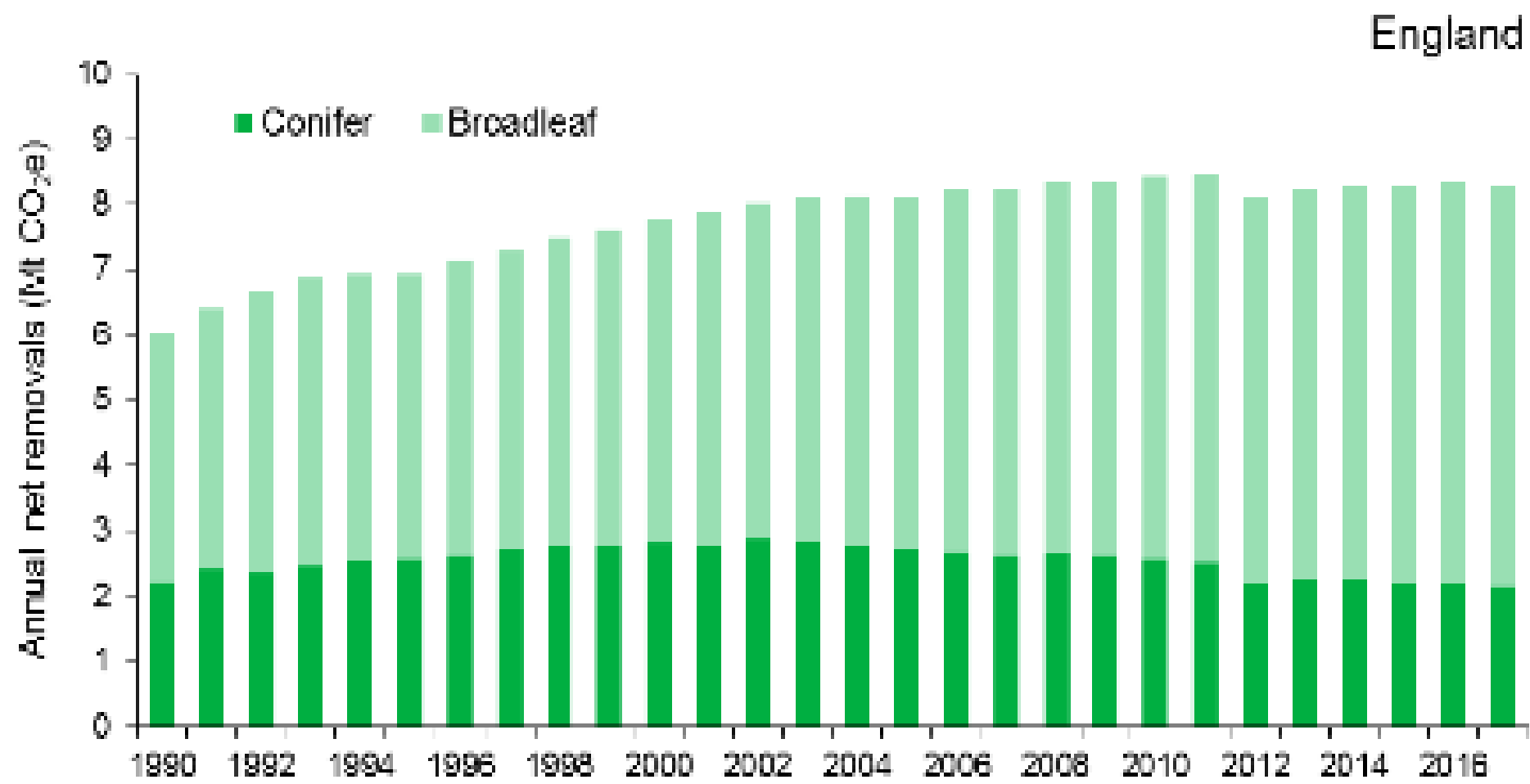


# Grass Enhances Beneficial Omega-3 in Lamb and Beef



(Scollan et al 2017)

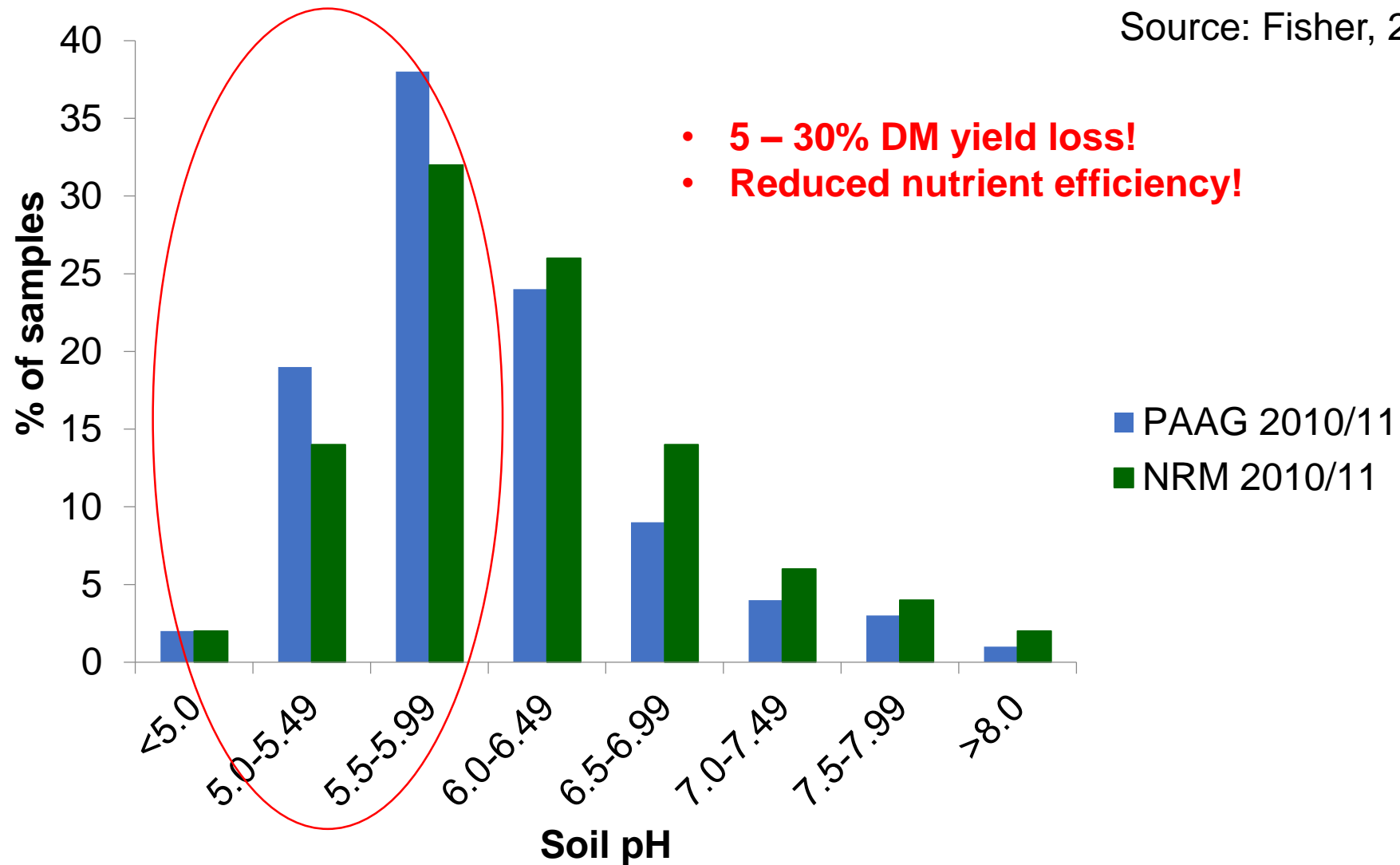
3.Revised in



**Figure 9.2: Annual net removals of greenhouse gases by forests in England, 1990 to 2017**

# Soil pH – UK Grassland Soils

Source: Fisher, 2013



Public engagement ; Percentage of respondents engaging with pro-environmental behaviours, 2009/10 to 2017/18 (Natural England)

