# Valuing the economic benefits of species recovery programmes

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# Evidence need and policy context

# Biodiversity in the UK is in decline

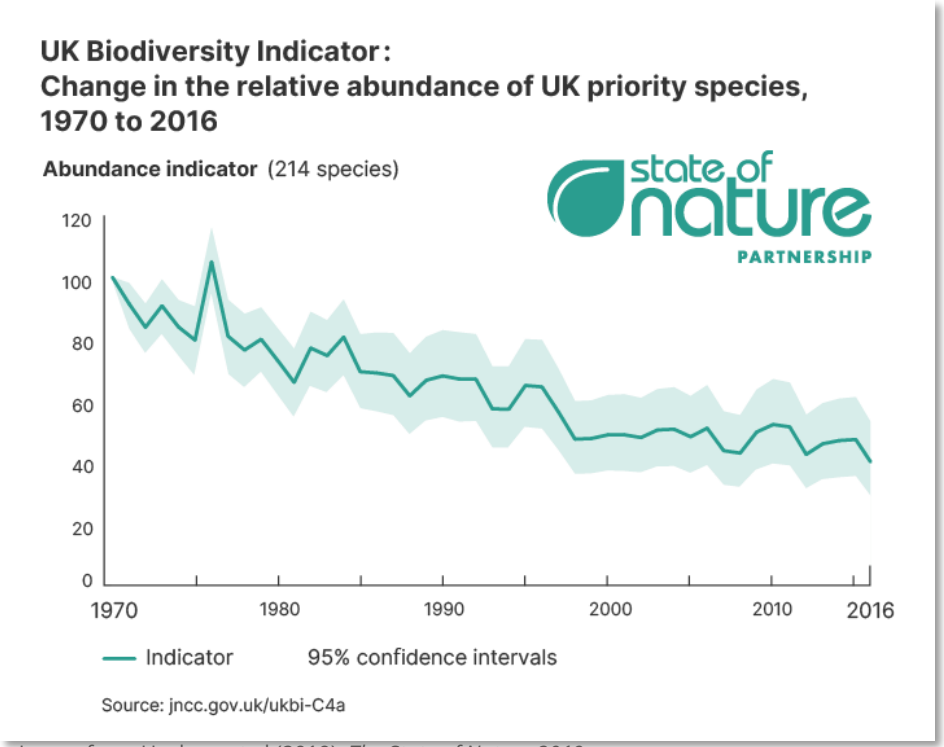



Image from Hayhow et al (2019), *The State of Nature 2019*
Available at: https://nbn.org.uk/wp-content/uploads/2019/09/State-of-Nature-2019-UK-full-report.pdf

**Overall, the population size of many types of animal, plant, and fungi species are in decline.**

- 13% of the species found in England are threatened with extinction
- 2% of species previously found in England are already extinct

**However, there are some bright spots:**

- Red Kites have recovered from an estimated 20 pairs in the 1960s to over 1,800 pairs today (RSPB)
- Bitterns were once locally extinct, and there are at least several hundred in the UK

# Monetary valuation can help shape the policies that will reach the ambitious goals to restore nature

UK Environment Act 2021 targets include:

- **Halt the decline in species abundance by 2030**
- Ensure that **species abundance** in 2042 is greater than 2022, and at least **10% greater** than 2030
- **Improve the Red List Index for England** for species extinction risk by 2042, compared to 2022 levels
- **Restore or create in excess of 500k hectares** of a range of wildlife-rich habitats *outside of protected* sites by 2042, compared to 2022 levels.

**Valuing species recovery and other evidence**

Enable policy makers to:

- Understand the publics' **preferences for species recovery**
- **Identify policy scenarios and actions** that provide greatest welfare benefit
- **Inform cost-benefit analysis** and determine which scenarios provide the best value for money

# Approach and implementation

# Discrete Choice Experiment

Our study used a Discrete Choice Experiment

- Choosing preferred policies for the future

Policy attributes our study focused on:

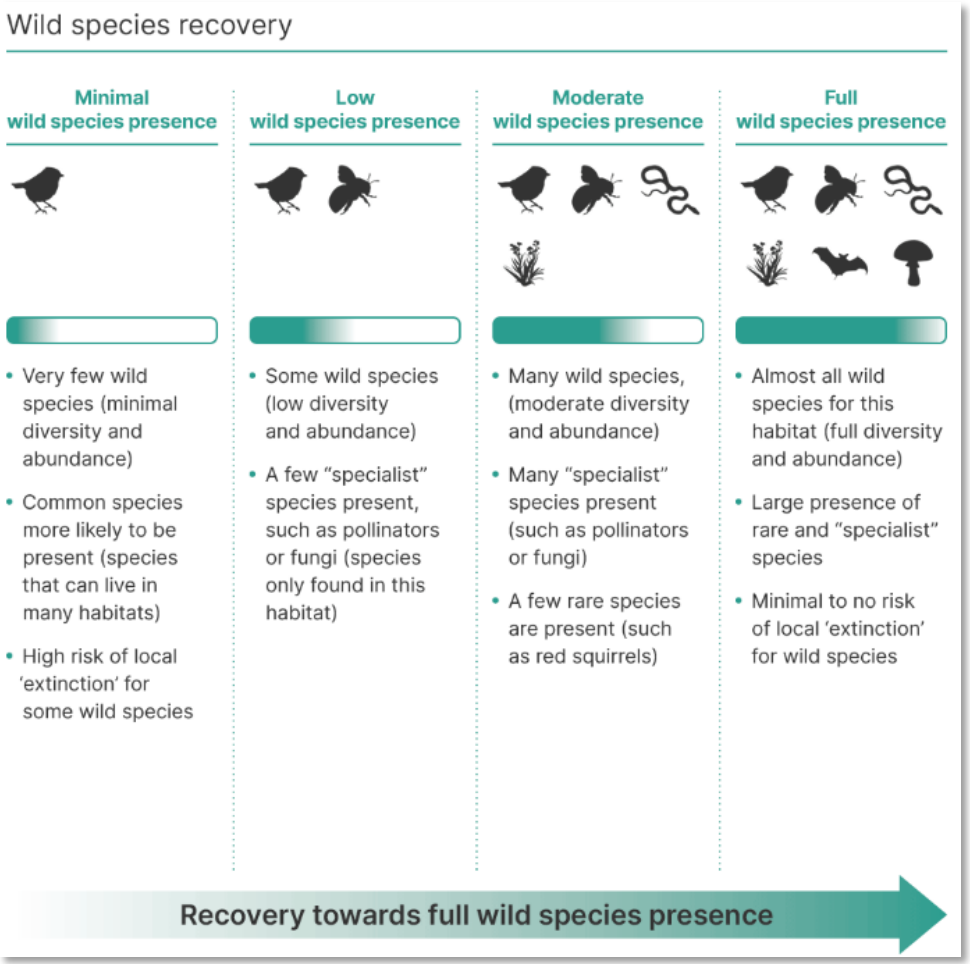
- **11 main habitat types**
- **How much** of each habitat is improved (%, ha)
- The **quality** of the habitats that will be improved
- The general **size of the sites** being improved
- Cost (to infer household **willingness to pay** based on the above dimensions)

# Defining species recovery

The **quality** of the habitats to be recovered was defined as a series of steps from minimal wild species presence to full wild species presence.

Recovery profiles were produced for a selection of **11 habitats:**

- Wood pasture parkland
- Mixed native deciduous woodland
- Upland oakwood
- Arable land (organic farming)
- Lowland hay meadows
- Semi-natural dry grassland
- Lowland heathland
- Lowland fens
- Blank bog
- Rivers
- Coastal sand dunes



# Example habitat and wild species recovery descriptions

## Wild species recovery – **Lowland heathland**

### Minimal wild species presence

- Very few wild species (minimal diversity and abundance)
- Species likely to be present:
  - Pygmy shrew
  - Slow worm
- High risk of local 'extinction' for some wild species

### Low wild species presence

- Some wild species (low diversity and abundance)
- Additional species likely to be present:
  - Stonechat
  - Silver-studded blue butterfly
  - Gorse
  - Heather

### Moderate wild species presence

- Many wild species, (moderate diversity and abundance)
- Additional species likely to be present:
  - Nightjar
  - Hen harrier
  - Adder
  - Common lizard
  - Large marsh grasshopper

### Full wild species presence

- Almost all wild species for this habitat (full diversity and abundance)
- Additional species likely to be present:
  - Smooth snake
  - Natterjack toad
  - Ladybird spider
  - Southern damselfly
  - Banded mining bee
  - Purbeck mason wasp
  - Heath tiger beetle
- Minimal to no risk of local 'extinction' for wild species

Recovery towards full wild species presence for **Lowland heathland**

## Habitat description – **Lowland heathland**

Holton Heath National Nature Reserve, Holt and West Moors Heaths SSSI, Dorset © Natural England/Peter Wakely 1993

### Description:

Habitat with lots of small shrubs, including heathers, and areas with grass, lichens along with scattered trees. This habitat is home to many insects, birds and reptiles and are important internationally as well as nationally for wildlife.

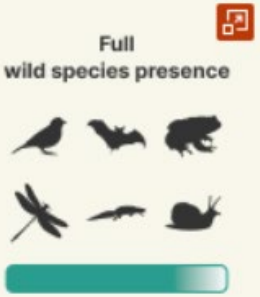
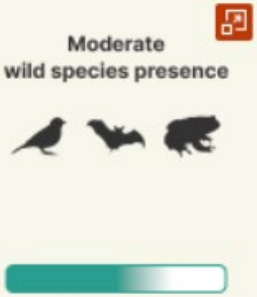
### Examples of species at risk:

- Pygmy shrews
- Nightjars
- Hen harriers
- Dartford warblers
- Stonechats
- Natterjack toads
- Smooth snakes
- Southern damselflies
- Heath tiger beetles
- Heather and bell heather

### Examples of this habitat:

- The New Forest (Hampshire)
- Also found in Dorset, Surrey, East Anglia, Derbyshire, Cumbria

# Example choice card

| | Scenario A | Scenario B | Scenario C |
|---|---|---|---|
|  Lowland fens |   |   | |
| Species recovery in lowland fens by 2042 | Moderate wildlife presence → **Full wildlife presence** | Low wildlife presence → **Moderate wildlife presence** | **No change in species recovery actions in lowland fens by 2042** |
| Amount of lowland fens improved | **7,500 Hectares** *About 37.5% of total lowland fens in England* | **2,500 Hectares** *About 12.5% of total lowland fens in England* | |
| Sites targeted by recovery actions | **Medium sites** | **Large sites** | |
| Increase in household expenditure due to recovery actions for lowland fens in England | **£150 per year** (£12.50 per month) *Amount from 2023 to 2042* | **£10 per year** (£0.83 per month) *Amount from 2023 to 2042* | **No additional cost** |

# Implementation

| Method | Dates | Respondents |
|---|---|---|
| **Focus groups** | Dec 2021 – Feb 2022 | - 129 participants in 15 groups<br><br>- Recruited in groups of eight based on geographic locations across England |
| **Survey** | Feb – Mar 2022 | - 5,000 respondents (online)<br><br>- Nationally representative sample of England by age, gender, and socio-economic group |

# Analysis and findings

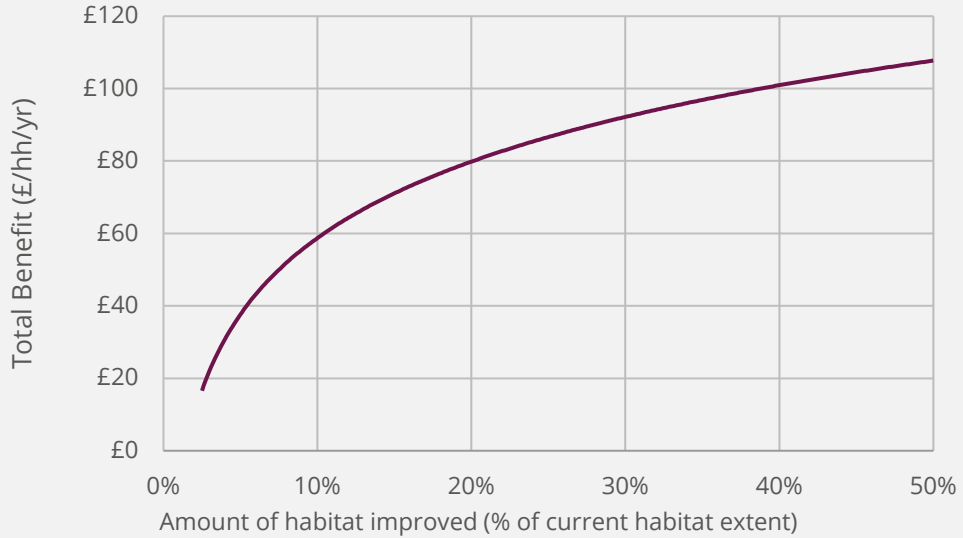
# Analysis

Main effects estimation (mixed-logit, WTP-space) shows:

- Respondents generally prefer recovery to sites where wildlife is already more abundant
- High value placed on "full recovery" of habitats resulting in restoring the species abundance to their intact states
- Large sites rather than medium-size sites preferred (better overall species recovery outcomes)
- Recovery on larger area of each habitat preferred

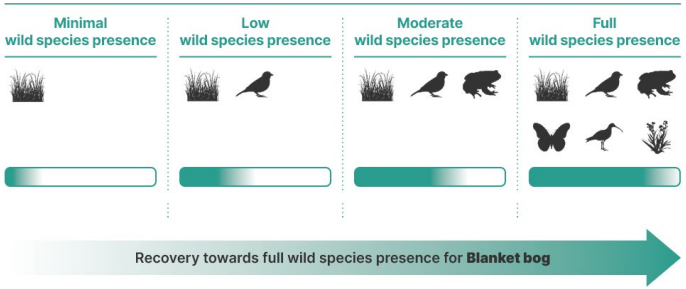
| Attribute | Level / measure | WTP | |
|---|---|---|---|
| | | Mean | St. dev. |
| **Species recovery by 2042** | Minimal to low | 169.12*** | 202.51*** |
| | Low to moderate | 327.37*** | 207.73*** |
| | Moderate to full | 458.33*** | 299.95*** |
| **Sites targeted by recovery actions** | Small sites | - | - |
| | Medium sites | 6.62*** | 6.82 |
| | Large sites | 15.01*** | 74.93*** |
| **Amount of habitat improved** | 100% | 195.40*** | 334.49*** |
| **Increase in household expenditure** | £1/hh/yr | -33.37*** | 113.27*** |

# Households have diminishing marginal returns for habitat improvement, and prefer improvements to full species presence



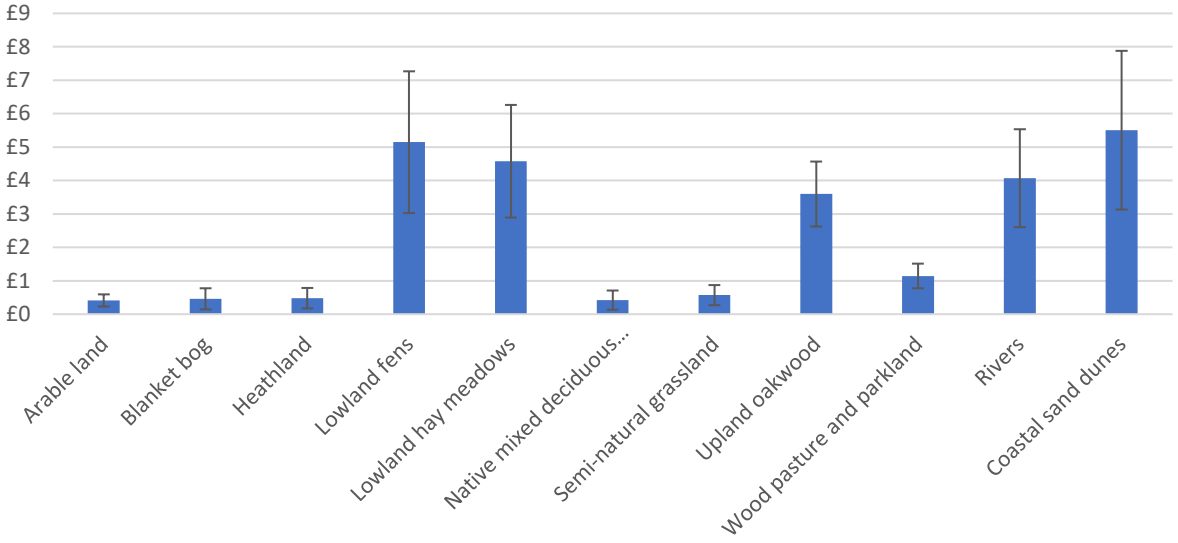

**Benefit of species recovery (£ / household / year)**

*Note: chart is for a single indicative habitat – not a full policy*




**Respondents generally prefer the step from moderate to full species presence over other improvements in species presence**

# Households place more value on species recovery outcomes that occur in more rare habitats

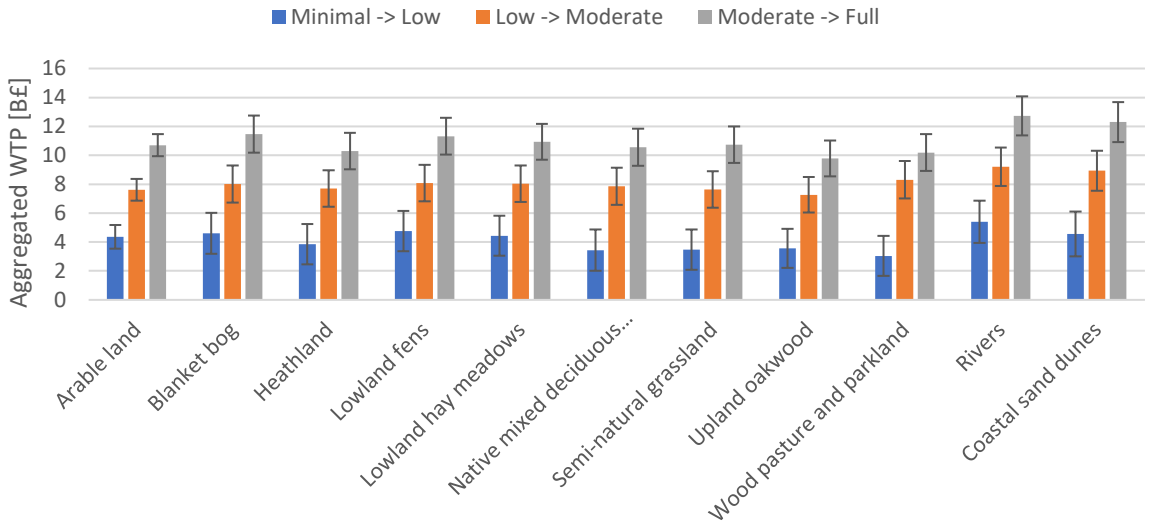



**Public marginal willingness to pay (WTP) for environmental recovery of additional 1000 ha of specific habitat types**

**Above – lowland fen**
**Below – arable field margin**

Both images – Natural England / Peter Wakely

# Simulated welfare benefits from policies




Simulated aggregated willingness to pay (WTP) for a policy aimed at 50% of the area of the targeted habitat

## Policy conclusions:

- Typically significant differences in WTP for policies that aim at low, moderate and full recovery
- The differences between habitats that are targeted by each policy are less stark*
- Overall, the aggregated WTP of English households was in the range of
  - 3-5 billion £ for minimal to low,
  - 7-9 B£ for low to moderate, and
  - 10-13 B£ for moderate to full wildlife improvements

Overall, households in England have a strong level of support for species recovery ambitions and place significant value on these outcomes.

Our research suggests that the aggregate annual benefits of species recovery are substantial.

The study's results can be used to tailor policy scenarios to reflect the public's preferences and maximise overall benefits.


THANK YOU

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**In collaboration with the Department of Environment Food & Rural Affairs**

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