Indicators of the impacts of climate change on biodiversity

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Background

• 15-37% of species ‘committed to extinction’, 2050 scenarios (Thomas et al. 2004)
• Species are expanding poleward and uphill; appearing earlier
Background

- 15-37% of species ‘committed to extinction’, 2050 scenarios (Thomas et al. 2004)
- Species are expanding poleward and uphill; appearing earlier
- Impacts
  - species’ phenology
  - abundance or geographic distribution of species or the communities which they form
  - inter-specific interactions (e.g. feeding relationships)
  - ecological/evolutionary responses
Existing climate change indicators
Timing of biological spring events

- Context indicator

Notes: *Number of days after January 1st (e.g. day 121 = May 1st).

Source: UK Phenology Network.
1. Climate positive and negative species

Species Distribution Model + climate change scenarios)

Impact of climatic change on bird populations

1. Climate positive and negative species
   Species Distribution Model + climate change scenarios

2. Weighted, multi-species population index for each group
   1980-2005 derived from the PECBMS

Climate Impacts Indicator

Index of climatic change impacts on bird populations

Other indicator approaches
• We expect species to move north
• As a result species composition will change
• More ‘warm’ species, less ‘cool’ species
• Method developed by Devictor et al. (2008) for birds in France
• Species Temperature Index (STI) is the long-term average temperature experienced by individuals of that species over its range.
A cool species: *Plebejus optilete*  

Source: Kudrna 2002

STI=4.2°C
A warm species: *Hipparchia fidia*

STI=13.5°C

Source: Kudrna 2002
Community Temperature Index – European butterflies

Phenology asynchrony

![Graph showing phenology asynchrony](image)

Points for discussion

• Do current and potential indicators:
  • Capture relevant biological impacts
  • Describe changing impacts in an accessible way
  • Raise awareness of the consequences of climatic warming for wildlife & for people
  • Help guide the implementation of mitigation & adaptation measures
  • Fit to CBD Aichi Targets
Questions for discussion

1. Are there existing indicators (including in other countries) which should be considered?
2. If so, how would they score using the quality framework used for the indicators review?
3. What data exist at a UK/GB scale (either directly, or by aggregation from country datasets)?
4. If UK data, can it be disaggregated to produce separate indicators for England, Scotland, Wales and Northern Ireland (or just some of these and if so, which)?
5. Are there possibilities to integrate different sources of data to produce a viable indicator at UK or country scales?
6. Are there monitoring schemes which could be adapted to provide appropriate data from which an indicator could be built?