



THE NATIONAL FOREST

Biodiversity change in the National Forest: 1990 – 2019

Introduction

- The National Forest project, working to restore and regenerate forest habitats across **200 square miles** of the English Midlands, has now been ongoing for 30 years. This summary document highlights key biodiversity trends in the project area from the beginning of the project to the present (**1990–2019**), providing the first detailed study of biodiversity change.
- The analysis shows **significant increases in species richness and abundance**, and underpins the National Forest's Biodiversity 30 by 30 campaign to contribute to nature's recovery, securing 30% of the land area for biodiversity by 2030.
- All biodiversity data for four key groups – **birds, bats, small mammals**, and **butterflies** – from within the project area between 1990-2019 were sourced from county record holders and the British Trust for Ornithology (BTO) 1990 and 2010 standardised survey results. Trends in **species abundance** and **species richness** were then analysed.

Species abundance

- Analysis shows very strong increases in **species abundance** in the study area for all groups (Figure 1). Percentage increase in decadal aggregate records between the 1990s and 2010s are exceptionally high (between +7087% and +538%, depending on taxa), although this may be driven by a lack of survey effort in the 1990s. However, percentage increase in aggregate records between the 2000s (which had strong sampling effort) and the 2010s also shows substantial increases in all taxa; **+263%** for all birds, **+96%** for woodland birds, **+72%** for raptors, **+860%** bats, **+18%** for small mammals, and **+148%** for butterflies.
- Not all trends were the same in all counties for all taxa, and indeed some taxa actually declined in some counties during the latter half of the study period – e.g. **small mammal abundance in Staffordshire declined by 40% between the 2000s and 2010s** (Figure 2). However, the clear overall pattern for all taxa was one of strong abundance increase.

- Strong positive abundance trends between the 2000s and 2010s were also noted in selected indicator species in each taxa: **Sparrowhawk** (a forest-breeding species in decline nationally) (+63.7%), **Brown long-eared bat** (a forest-dependent species) (+332%) and **Speckled wood butterfly** (a forest-edge specialist) (+117%). A more modest positive abundance trend was noted in **Field vole** (an open area specialist) (+64.7%).

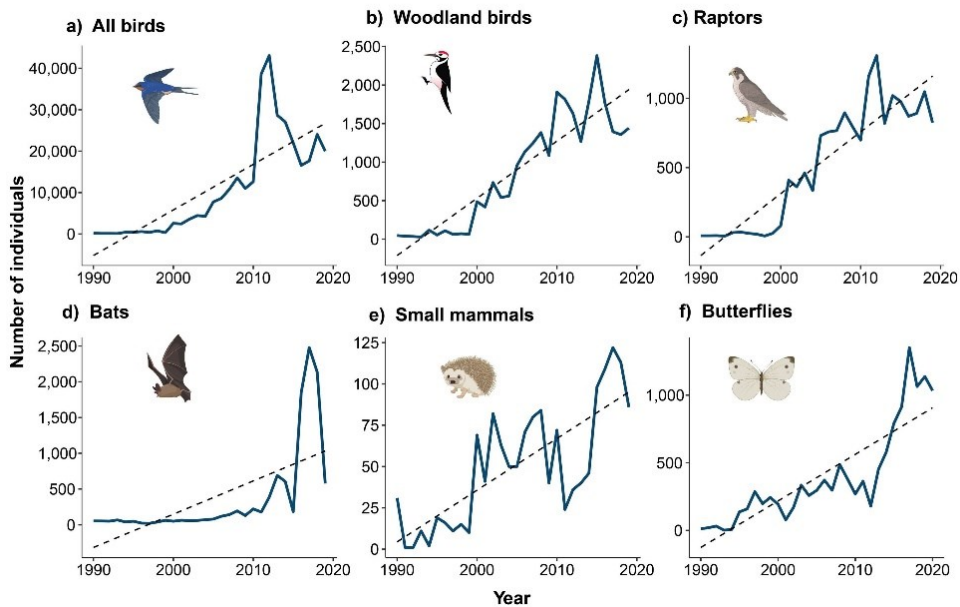


Figure 1 – Trends in species abundance in the National Forest

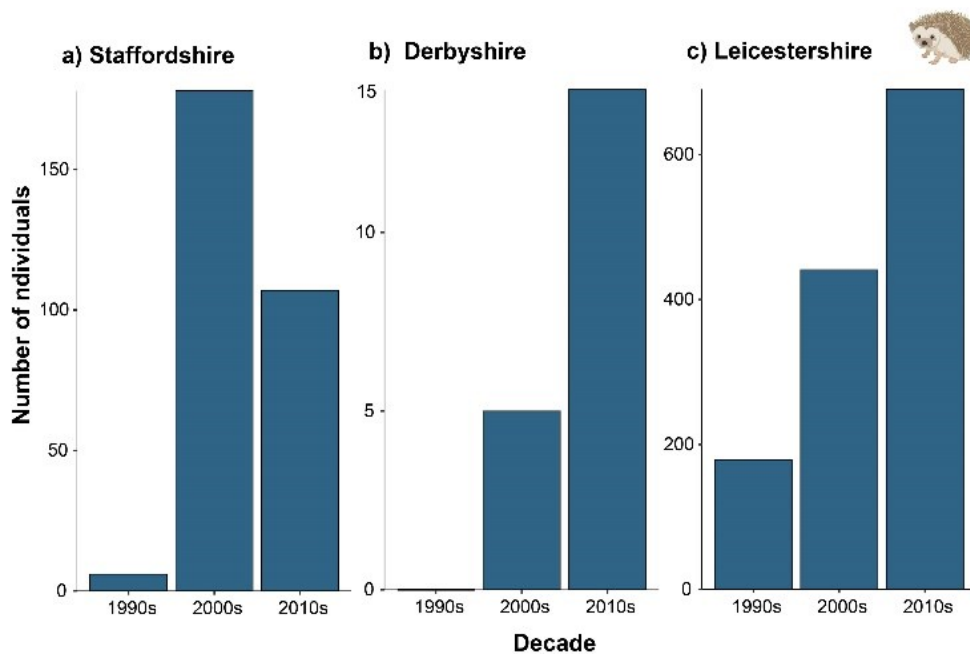


Figure 2 – Aggregate decadal small mammal records for the National Forest in Staffordshire, Derbyshire, and Leicestershire

Species richness

- Analysis of county records also indicates a large increase in species richness for all groups in the study area between the 1990s and 2010s (**between +31% and +125%** depending on taxa). However, this may again be partially driven by low sampling effort in the 1990s.
- Species richness change between the 2000s and 2010s is much more modest; **≤1% increase** for all taxa except bats (+29%) and butterflies (+22%). However, this recent levelling-out of diversity only relates to landscape-scale (γ -diversity) change. More local (α -diversity) change in specific afforested areas could be much higher; this requires further research.

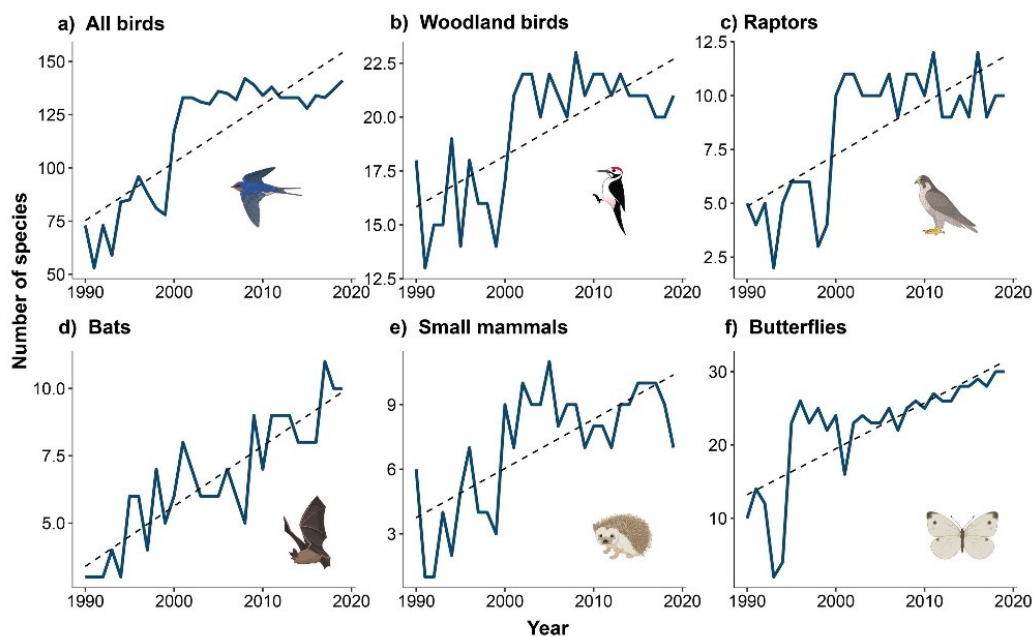


Figure 3 – Trends in species richness in the National Forest

- Importantly, positive species richness trends are backed up by trends in the **BTO data**, with bird richness increasing substantially: an average value of **+43%** for all birds, **+78%** for woodland birds, and **+317%** for raptors) in all study squares between 1990 and 2010. This is encouraging, firstly as this more locally-aggregated data may be a better reflection of α -diversity trends in the study area, and secondly as trends in this standardised dataset match those in the more opportunistically-sourced county archive records.

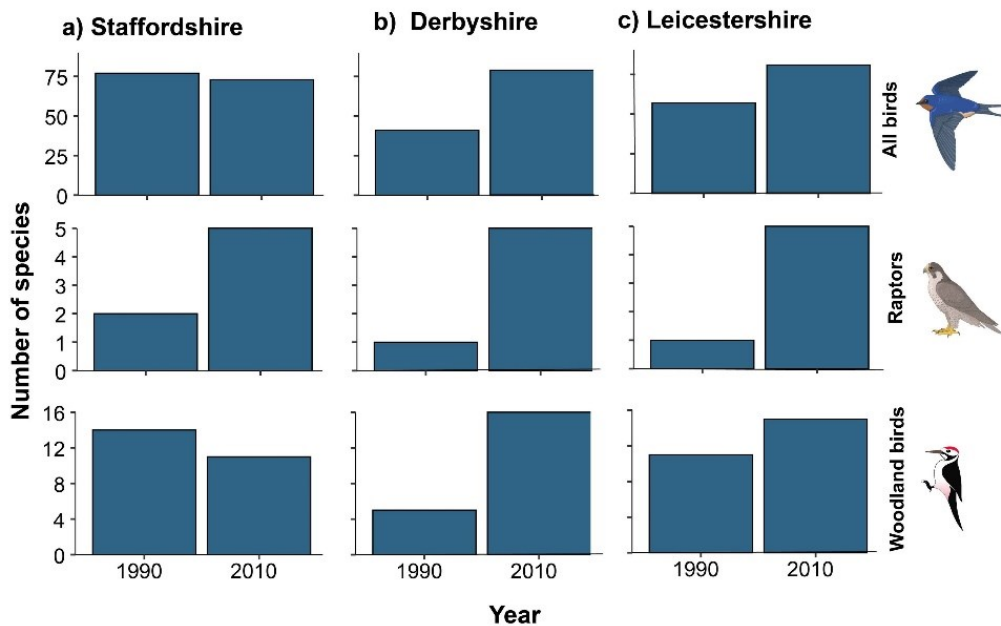


Figure 4 – BTO species richness values from the 1990 and 2010 standardized surveys

Conclusions

- While data limitations mean that some caution is required when interpreting the trends presented in this report, overall patterns are suggestive of **strong increases in species abundance and richness** in the NFC project area. Particularly encouraging are positive demographic trends in groups which are declining nationally; eg in the last five years woodland birds have **decreased by 7% nationally** but **increased by 48% in the National Forest**. Similarly, butterflies have **decreased nationally in the last decade by 16%**, but **increased in the National Forest by 14.8%**.
- This supports the National Forest **Biodiversity 30 by 30 campaign**, demonstrating that creating, enhancing and managing new Forest habitat can help to reverse declines in priority species even in non-protected landscapes.

Acknowledgements

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- A full version of this report with associated data appendices is available on request. Please contact Dr Heather Gilbert at hgilbert@nationalforest.org