EGU Sharing Geoscience Online 2020

Human land-use impacts on land-cover and biodiversity in the British Isles

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Project: Biodiversity and land-use change in the British Isles

- European biodiversity patterns have been shaped by humans over long time-scales, with deforestation, agriculture, grazing, fire and settlement having significant impacts
- Biodiversity plays an important role in ecosystem functioning, habitat recovery following disturbance, and resilience to global environmental change.
- Deep-time ecological records can be used to explore biodiversity patterns and trends over multi-millennial time scales across broad regions.
- Leverhulme Trust-funded project aims to use long-term datasets to reconstruct and explain changing patterns of biodiversity during the Holocene







Initial data synthesis



Legend

- archaeobotanical site (Tomlinson & Hall 1996)
- insect site (Smith et al in press)
- radiocarbon-dated archaeological sites

Pollen sites (Fyfe et al 2013; 2018)

- Scotland
- South-west England
- South-east England
- Mid-lands/northern England
- Wales



Pollen datasets: European Pollen Database Fyfe et al. (2013: *QSR*)

Insect faunal data: Smith et al. (2019: *Holocene*) (2020: *JAS*)

Archaeobotanical data: ABCD (Tomlinson & Hall, 1991), ADAPT and EUROEVOL (Colledge 2016: *J. Open Arch. Data*), ArboDAT

Palaeo-demographic data: Bevan et al. (2017: *PNAS*)









Initial data synthesis



Take-home messages

Initial synthesis:

- Declining tree cover at start of Neolithic and Bronze Age coincided with increases in population, and open ground insects and cereals since the Bronze Age
- Vegetation diversity increased when landscapes became more open
- Important to investigate trends at sub-regional and site specific scales

• Future direction:

- Pollen and archaeobotanical datasets can be used to improve understanding of past relationships, particularly at sub-regional scales, but is dependent on synthesising additional datasets through collaboration
- To fully understand long-term drivers of biodiversity change, future research needs to focus on amalgamating diverse data types, along with community efforts to harmonise data across broad regions and time scales

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