

# URBAN ANCIENT WOODLAND:

Using historic records  
to identify changes in  
ancient woodland flora  
in a new urban context

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supervised by Dr Philip Wheeler, Dr Kadmiel  
Maseyk and Dr Sarah Davies.





# Ancient Woodland in the UK

**Ancient Woodland** = land that has been continuously forested since 1600CE and has a rich flora of indicator species and archaeological features.

**Ancient semi-natural woodland (ASNW)**

404,688 ha in England, Scotland, Wales & NI

**Plantations on ancient woodland sites (PAWS)**

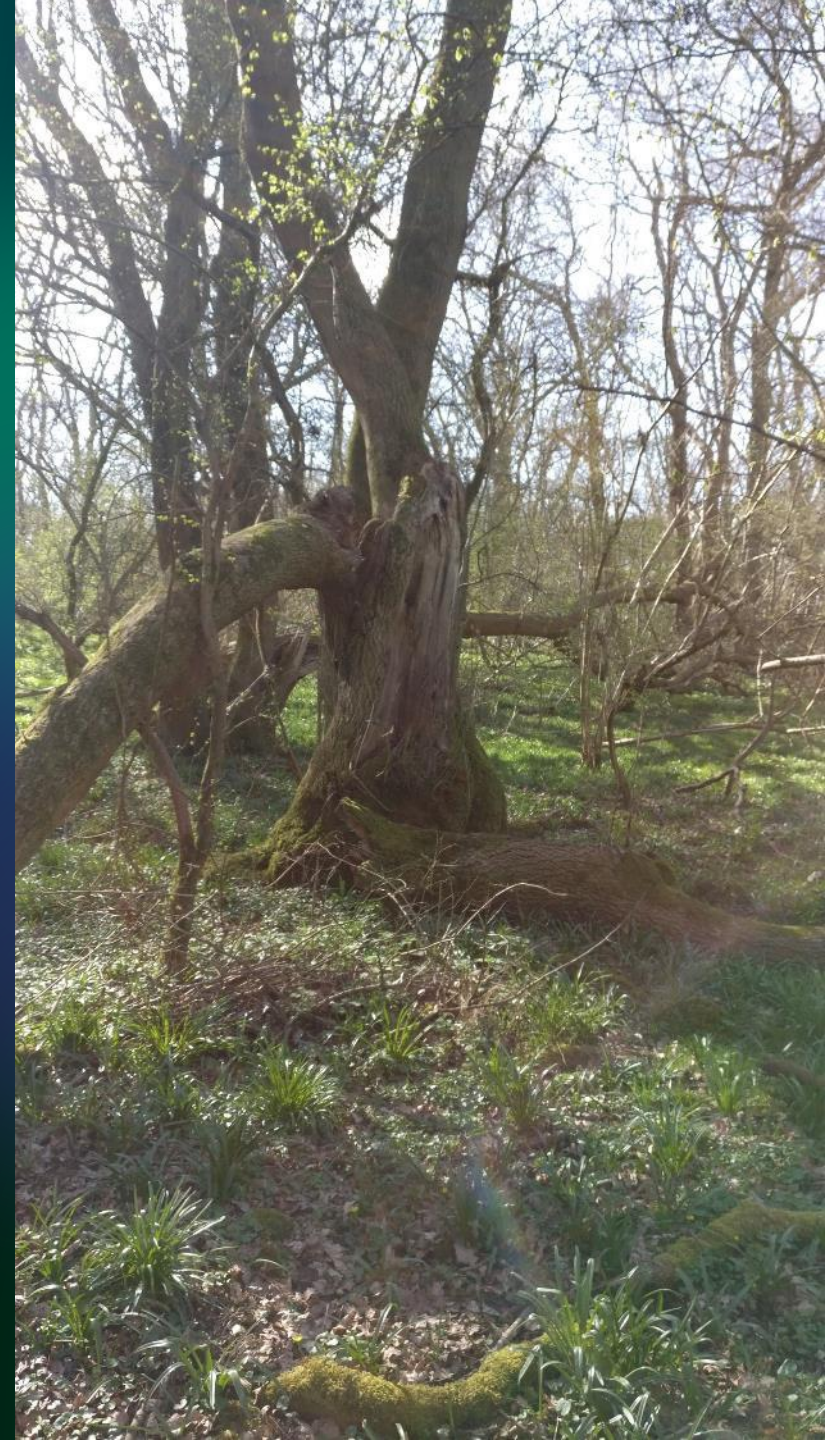
202,747 ha in England, Scotland, Wales & NI

## UK Ancient Woodland coverage in 2020 (ha)

England	Wales	Scotland	N. Ireland	Total
364,315	94,965	148,153	2,700	610,134 (2.5% of UK)

Definition from Spencer and Kirby (1992) *Biological Conservation* 62:77-93.

Statistics from Reid, C. et al. (2021) *State of the UK's Woods and Trees 2021*, The Woodland Trust.





# Impacts of urbanisation

- Increased visitor pressure
- Pollutants
- Fragmentation/isolation of habitat
- Invasive species
- Changing hydrology
- Urban heat island effects on phenology
- Changes in management

Corney, P. et al. (2008) *Impacts of Nearby Development on the Ecology of Ancient Woodland*, The Woodland Trust.

Ryan, L. (2014) *Impacts of Nearby Development on Ancient Woodland - addendum*, The Woodland Trust





Heat map of number of ancient woodland sites <100m from urban fabric. Highest density = yellow.

## Ancient Woodlands in urban areas

10.4% of ancient woodland is within 100m of urban fabric (44,189ha in England, 9,202ha in Wales and 9,890ha in Scotland).

1.8% of ancient woodland is within 100m of a major town or city boundary (population >70,000).

### Milton Keynes

Population: 230,000 (2011 census)

Rapid urbanisation since the 1970s development of the "new town".





# Urban ancient woodland in Milton Keynes





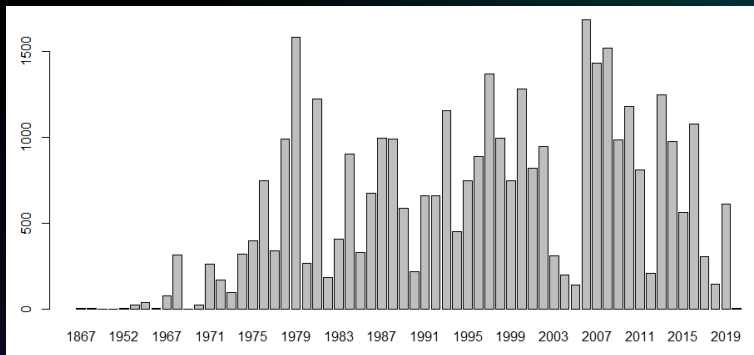
# Urban and rural ancient woodland near Milton Keynes





# Historic Records of Ancient Woodland Plants

All records of vascular plants, bryophytes and fungi within 1km of the boundary of each woodland.

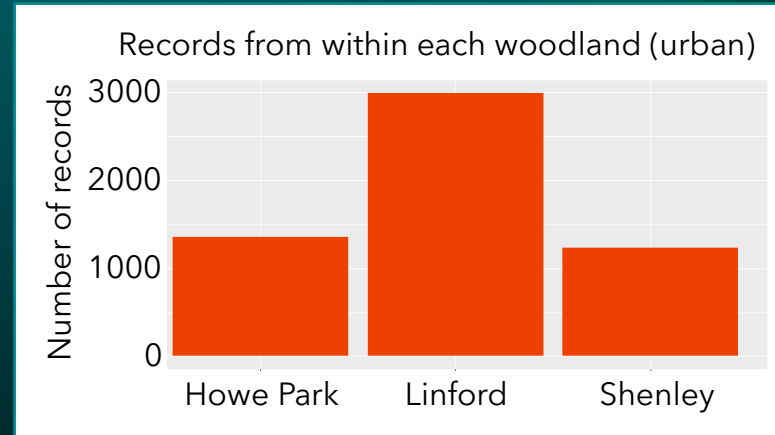
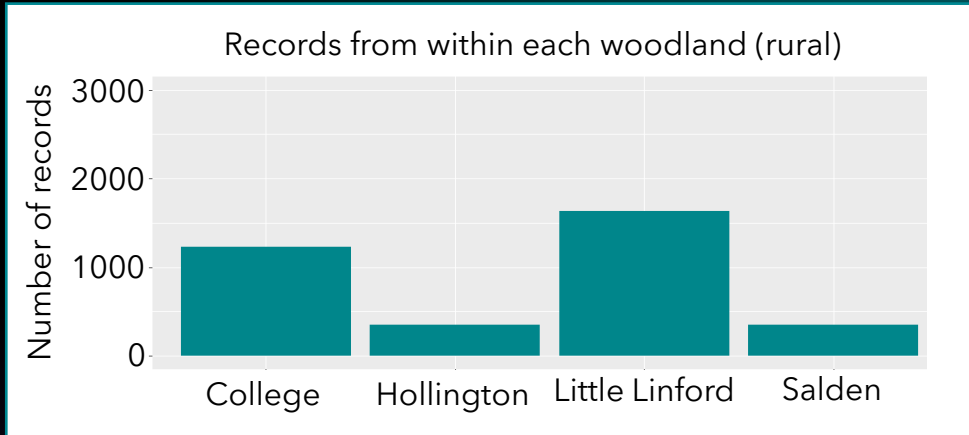


## Data sources:



## Data analysis

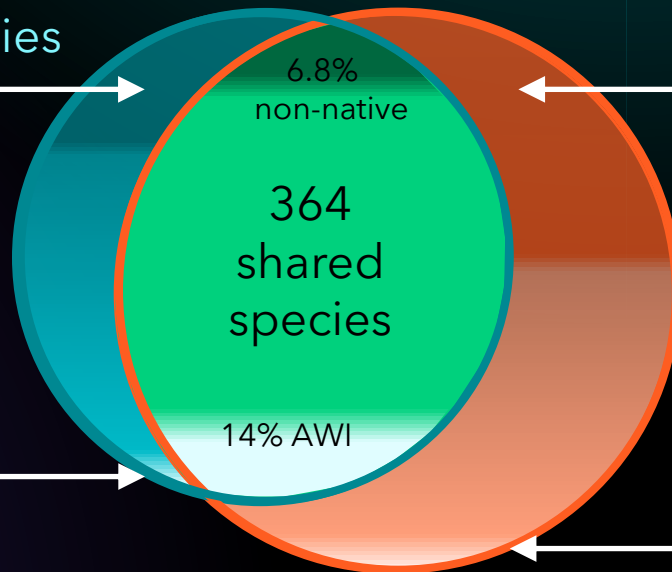
Analyses carried out in R using packages including: Sparta, iNEXT, Vegan, Arsenal



15 (20%) non-native species  
(intrd-natd/-casual/-surv)

76 species found  
only in rural  
woodlands

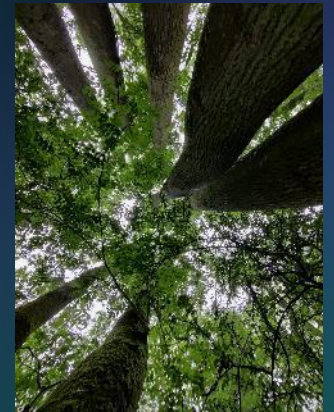
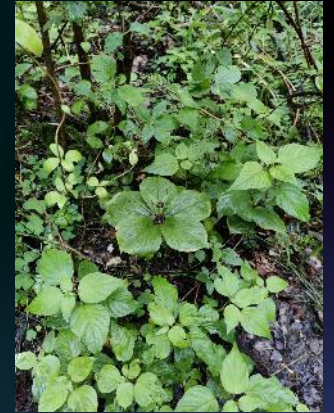
2 (2.6%) AWI species



55 (38%) non-native species  
(intrd-natd/-casual/-surv)

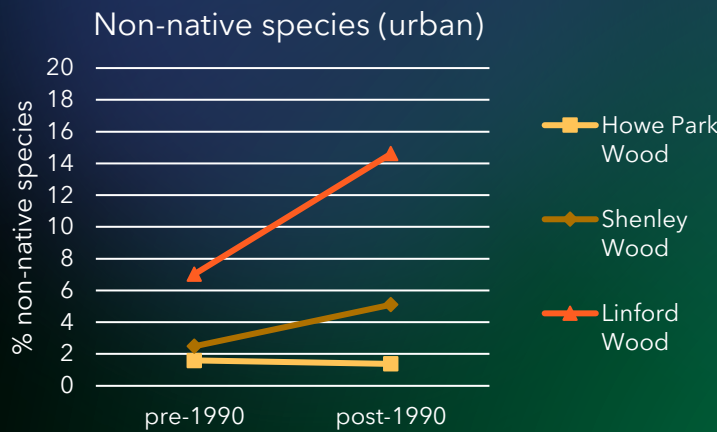
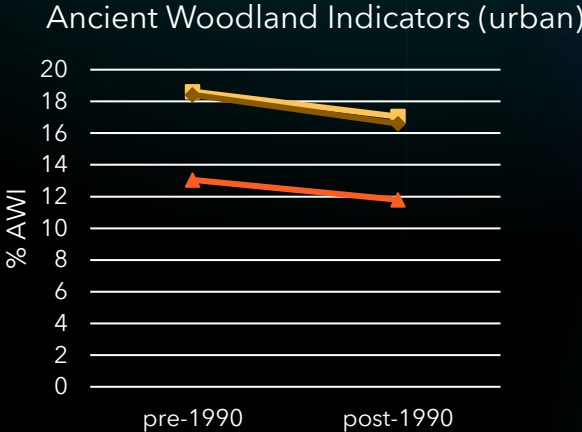
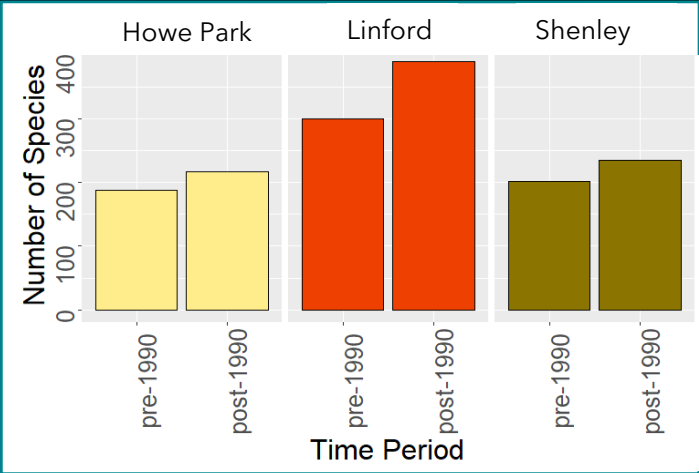
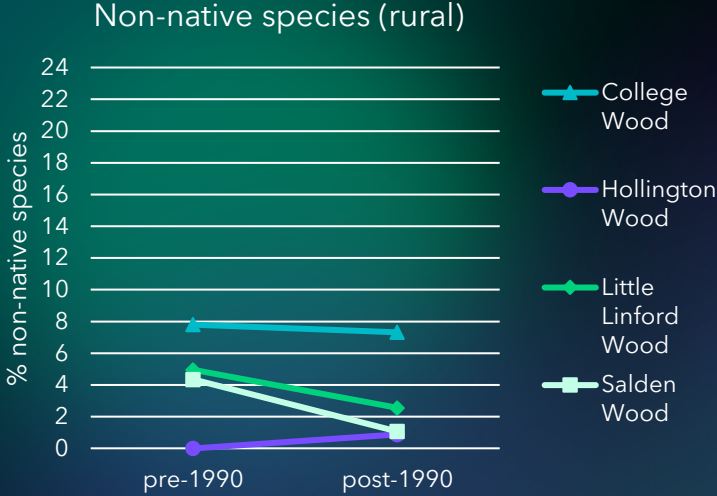
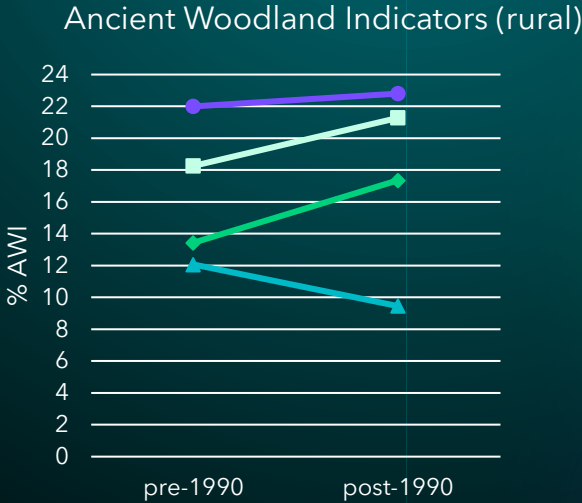
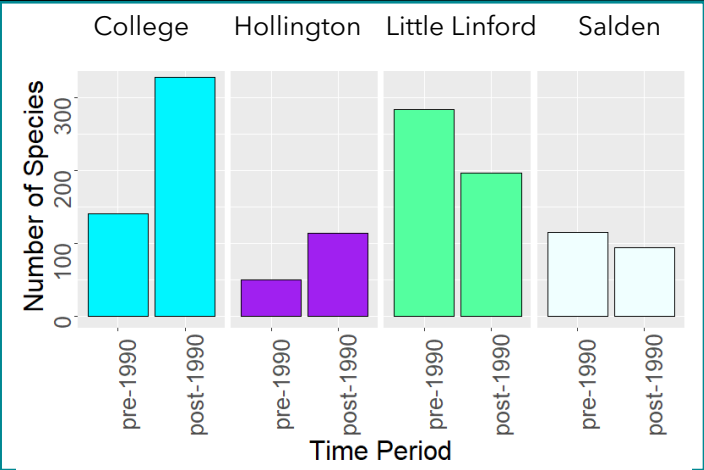
146 species found  
only in urban  
woodlands

7 (4.8%) AWI species





# Change in types of species recorded before and after 1990







## Conclusions

- A significant proportion of the UK's ancient woodland is likely to be impacted by urbanisation
- A high proportion of the species found only in urban woodlands were non-native species.
- Trends indicate fewer ancient woodland indicators and more non-native species in most Milton Keynes woodlands since urbanisation.

## Next steps:

- Use rarefaction to put trends in the context of recording effort.
- Investigate changes within woodlands using survey data and records with precise localities.

Please get in touch if you have any questions

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