

New Forest Curlews:

Predation and other factors affecting their breeding success



Elli Rivers - Curlew PhD project

Mike Short - Head of Predation Management Research



Four years of data collection. We've been busy....

- 116 curlew breeding attempts monitored
- 41 curlew nests monitored with trail cameras
- 54 lapwing nests also monitored with trail cameras as a comparative species, and one snipe!
- 13 adult curlews GPS tagged
- 21 curlew chicks radio-tagged and tracked daily with 100% known outcomes

- **Analysis objectives:**

Nest site selection

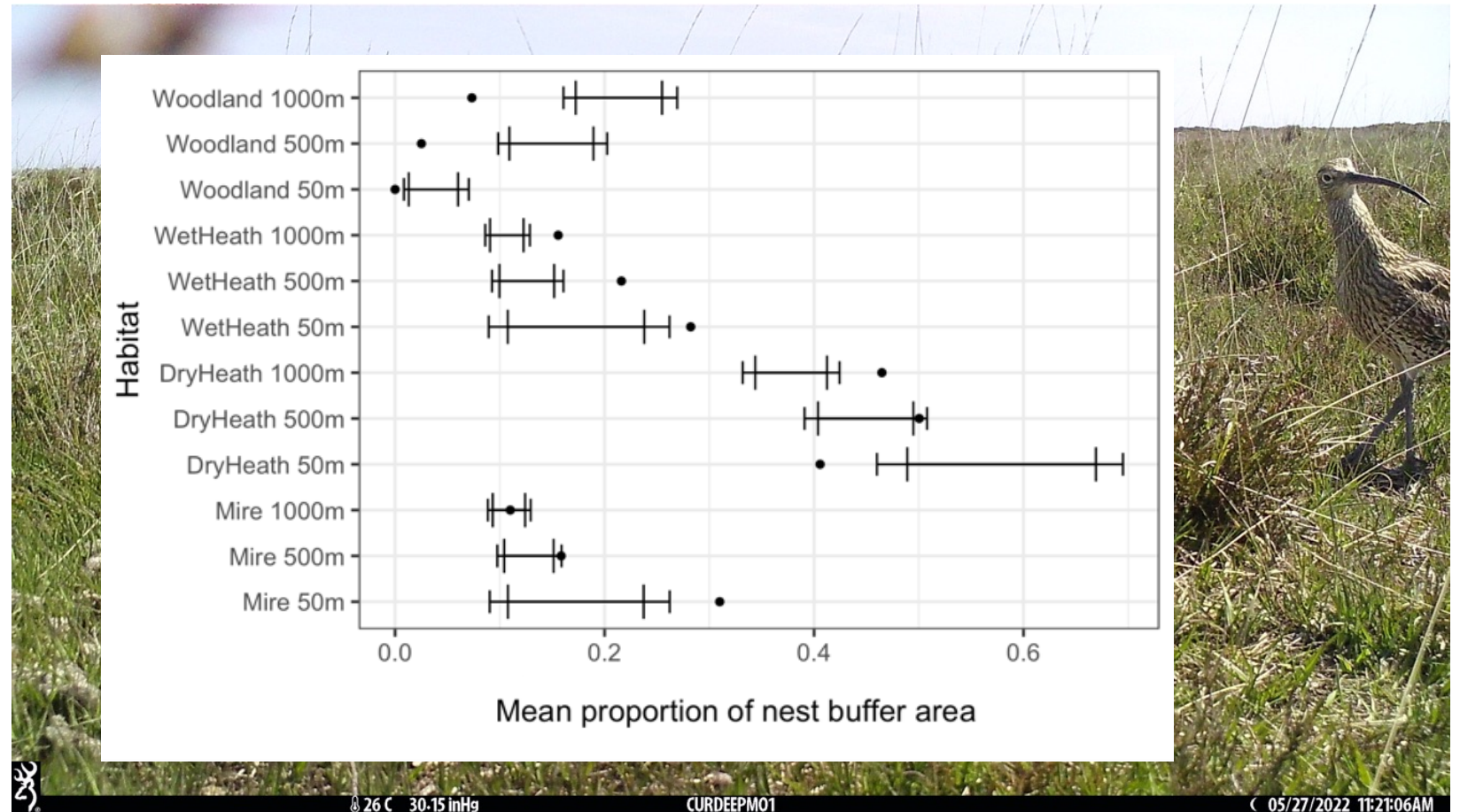
Nest survival

Habitat selection during brood rearing and factors influencing chick survival

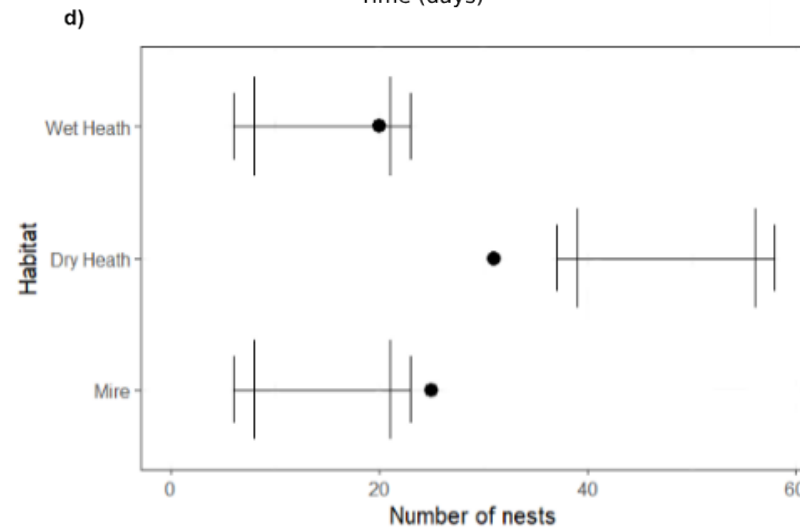
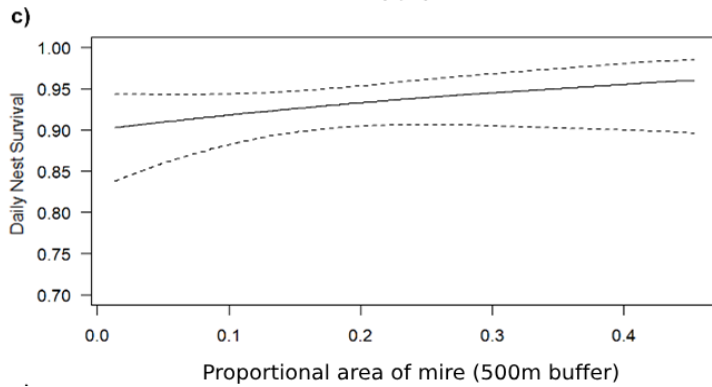
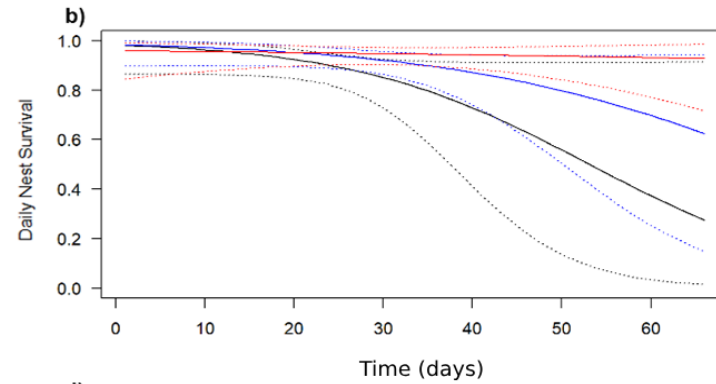
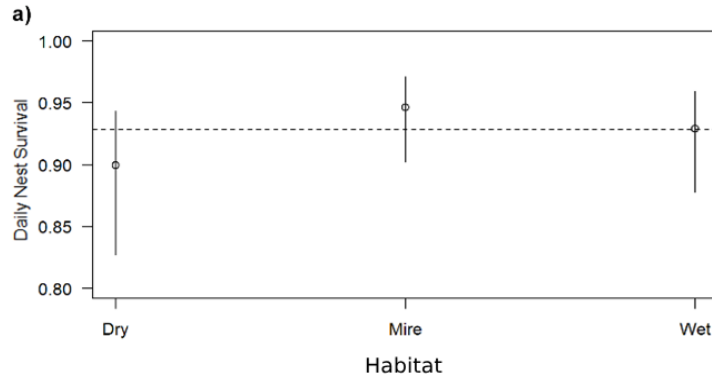
Adult landscape use and functionally linked land

Nest site selection

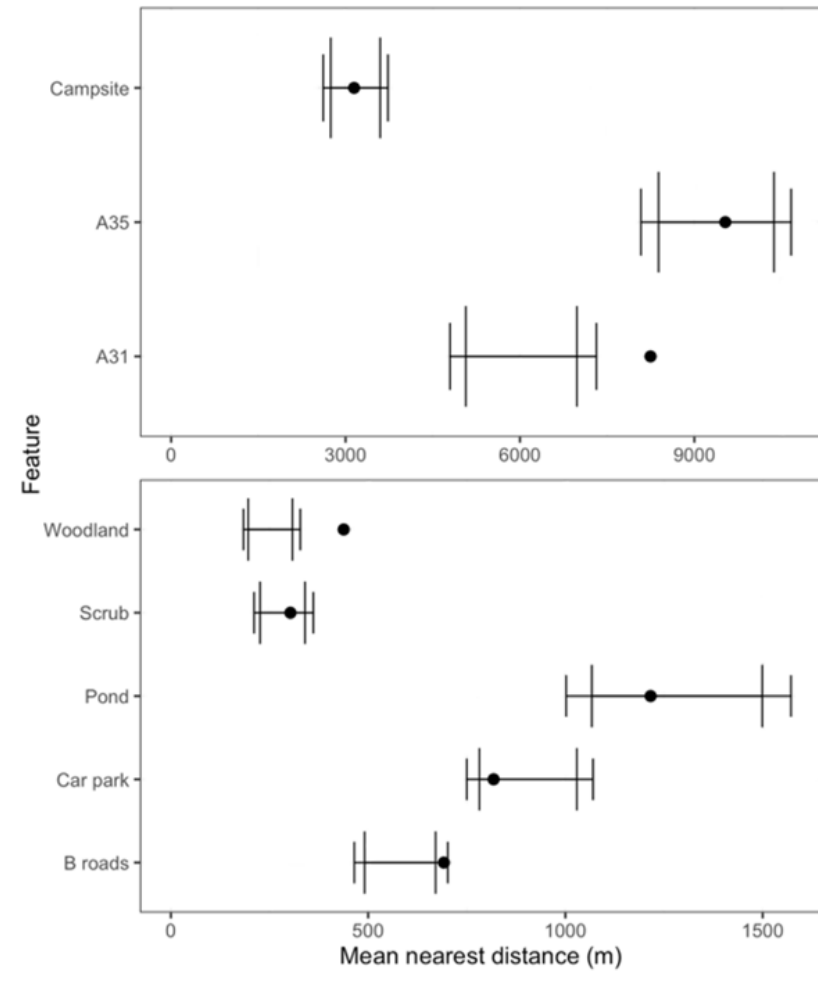
- Strong non-random preference for mire compared to dry heath.
- In all buffer size classes woodland covered proportionally less area than random, and wet heath more area.
- Dry heath area was lower than random in the immediate 50m buffer, but this relationship reversed at 1000m.
- The area of mire in the 50m buffers was higher than in the random distribution, but this relationship weakened in the bigger buffer classes.



Habitat influences on nest survival



A31 and woodland avoided



- In distance measures, nests were placed further from woodland and the A31 than random distribution.
- No strong influence on nest placement from car parks, campsites, scrub, ponds or the A35.

The short version: Mire habitats are important to curlew



Nest survival



Building on chapter 1, looking at anthropogenic factors which might be influencing nest survival.



Nest exposure time as a proxy for disturbance, using trail camera data and AI model.



Fox sighting rate, separated by beats in the Forest.



Trail camera predator identities.



17 fox predations



4 crow predations

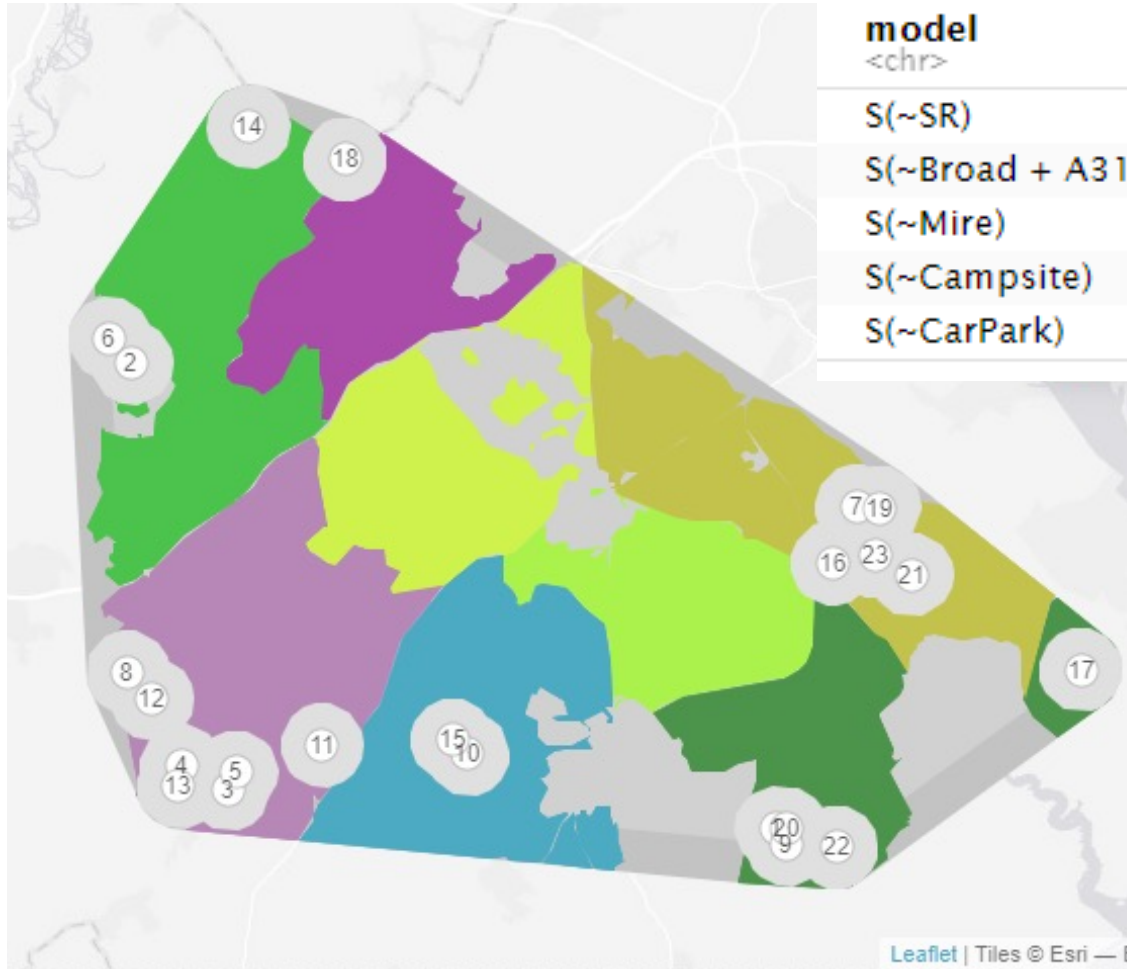


1 badger predation



1 dog predation

Fox sighting rates



- Detailed fox culling records have been kept by New Forest keepers since 2021.
- Sighting rates derived from these records have been included in nest survival analyses as a measure of potential predation pressure.
- Fox sighting rate was found to be the strongest predictor of nest failure of all modelled covariates: distance to campsite, car park, roads and characteristic of mire habitat.

Chick survival



21 curlew chicks radio-tagged with 0.6g microtags.

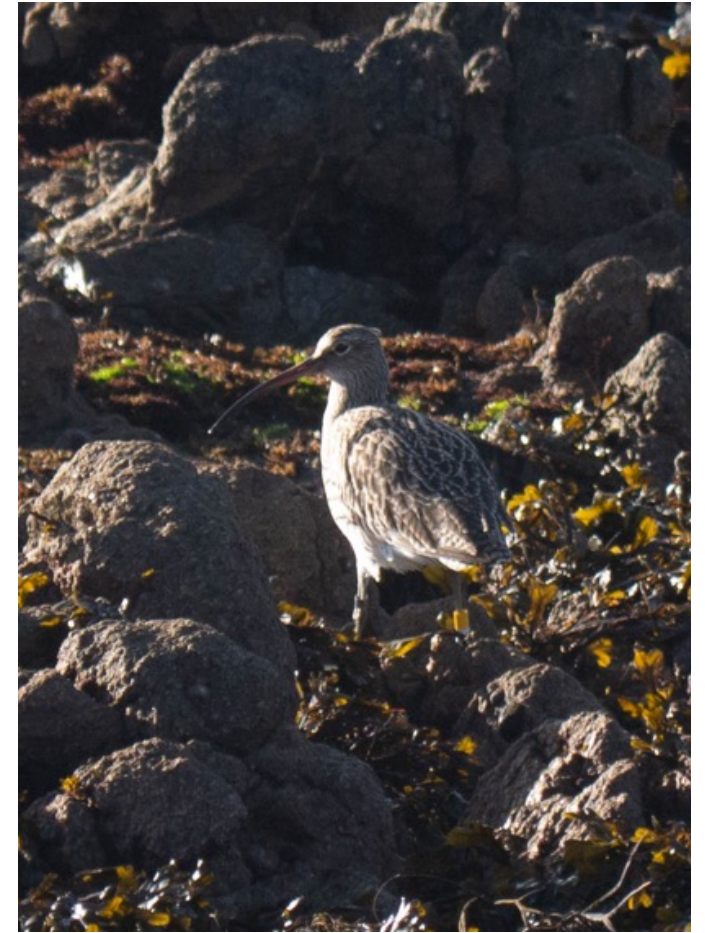
Followed intensively – every chick, every day.

Position of brood recorded daily for habitat usage.

100% known outcome for every chick in the study: fledged, predated or died.

Recovered tags being analysed for possible recovery of predator DNA at Exeter University.

All grown up... and in Brittany



...and Devon






Why is fox predation such a problem locally?

- **LIFE Waders for Real** project, Avon Valley (2015-2019)
- 35 adult foxes GPS-tagged from March to July in two wet grassland sites important for breeding waders
- Minimum fox density at Britford = 10.6 foxes/km² and at Somerley = 2.4 foxes/km²
- Camera trapping and genotyping indicates fox density at Britford was considerably higher with transients
- Why? No fox control + discarded fish waste
- Waders no longer...

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<https://doi.org/10.1007/s10344-023-01759-y>

RESEARCH

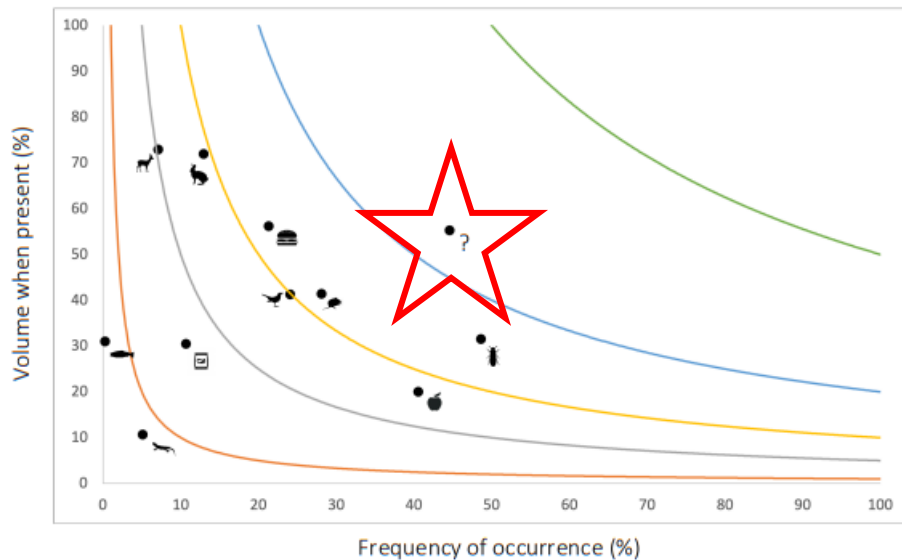
Movement ecology and minimum density estimates of red foxes in wet grassland habitats used by breeding wading birds

Tom A. Porteus¹  · Mike J. Short¹ · Andrew N. Hoodless¹ · Jonathan C. Reynolds¹



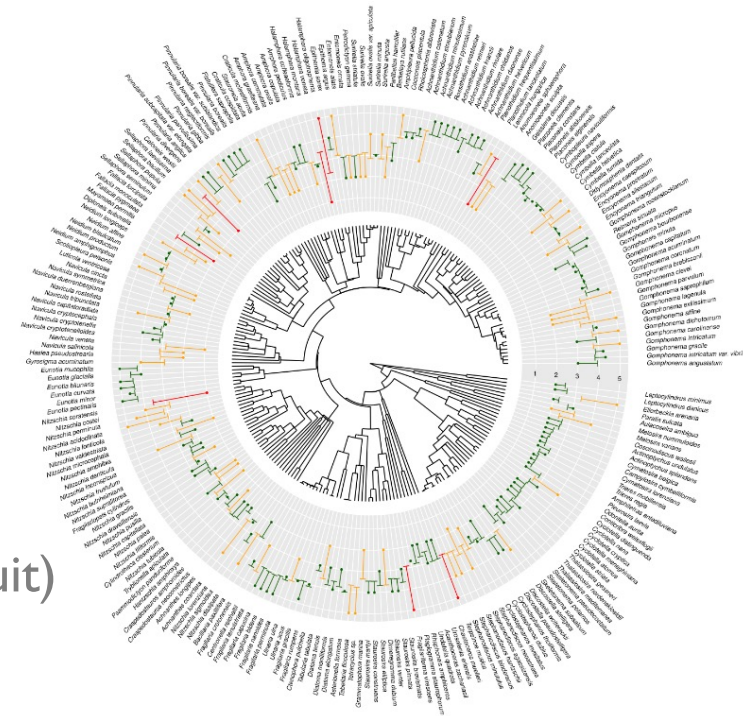
What food resources support New Forest foxes?

- **Nathan Williams, PhD:** “Causes and implications of Fox Population Dynamics in Central Southern England”
- **Macroscopic diet analysis** 452 fox stomachs collected by New Forest wildlife managers
- Anthropogenic foods account for ca. 12% of fox diet
- Presence is predicted by proximity to human settlements



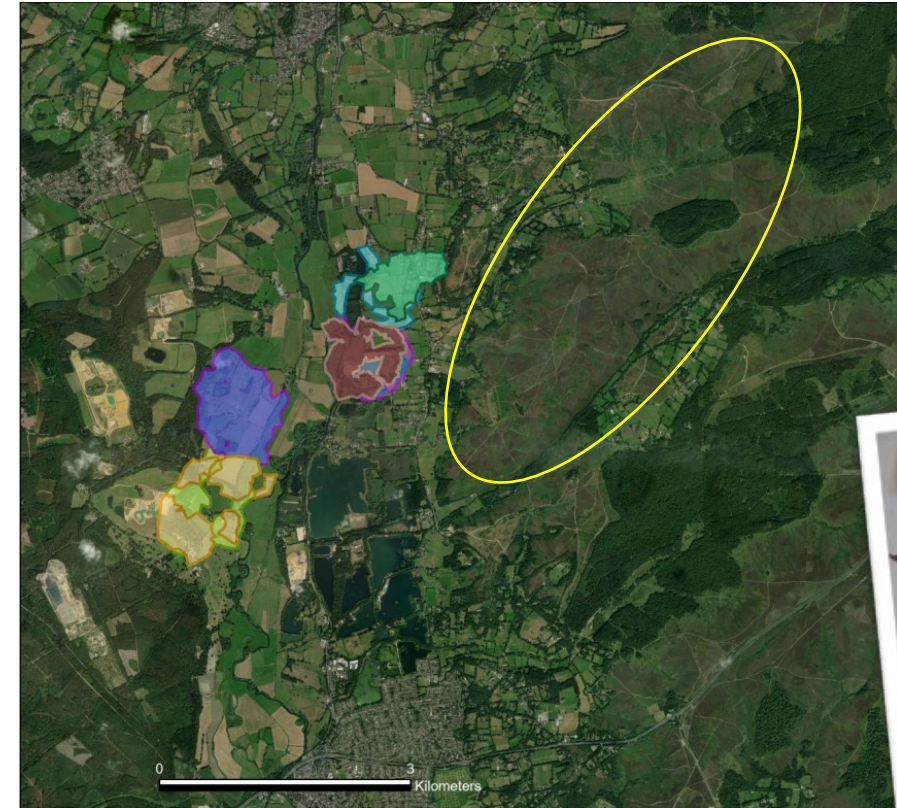
What food resources support New Forest foxes?

- **Molecular diet analysis** – this will identify food items we can't see
- Metabarcoding stomach contents
 - ground-nesting birds / herptiles / livestock afterbirth / dog faeces
- Stable-isotope analysis of fox hair
 - identifies broad food categories (e.g. grazing mammal / gamebirds / fruit)
 - important to know about the diet of immigrant foxes
 - RAD-sequencing to genetically map movements of urban and rural foxes



What are the effects of anthropogenic subsidisation?

- Computer modelling of New Forest fox data
 - diet / culling records / productivity / local fox density estimates / known food requirements
- Estimated total annual volume of anthropogenic food consumed by foxes and how many individuals this resource could support in isolation
- Calculations indicate number of foxes subsidised by anthropogenic food equates to more than half the total number culled by wildlife managers
- Culling foxes is expensive and controversial but currently there are no practical alternatives to protect curlew nests
- Better local food sanitation and education should become key parts of a more holistic management approach to reduce the burden of fox predation
- In Review: Williams *et al* (2024) Evidence of anthropogenic subsidisation of red foxes in a national park important for wading birds



New Forest Curlews – what's next?

- **Understanding chick survival**
 - habitat quality, predation, disturbance, livestock density and parasite burdens
- Post-fledging survival: how many fledglings recruit?
- Do adult curlews have favoured pastoral feeding areas in and around the Forest?

- How will curlews respond to changes in management?
- Will compensatory predation by protected species become a problem?
- Could non-lethal nest protection methods work?
- What will a successful curlew recovery look like?
- We need a longer-term curlew monitoring program



Acknowledgements

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