



Securing a future for beach-nesting shorebirds in England

AMOY meeting, Cape May
16 October 2025
Mike Short



1991
CSIRO
Australia



1996
GWCT



2015



2023

The Gravelly Shores Project

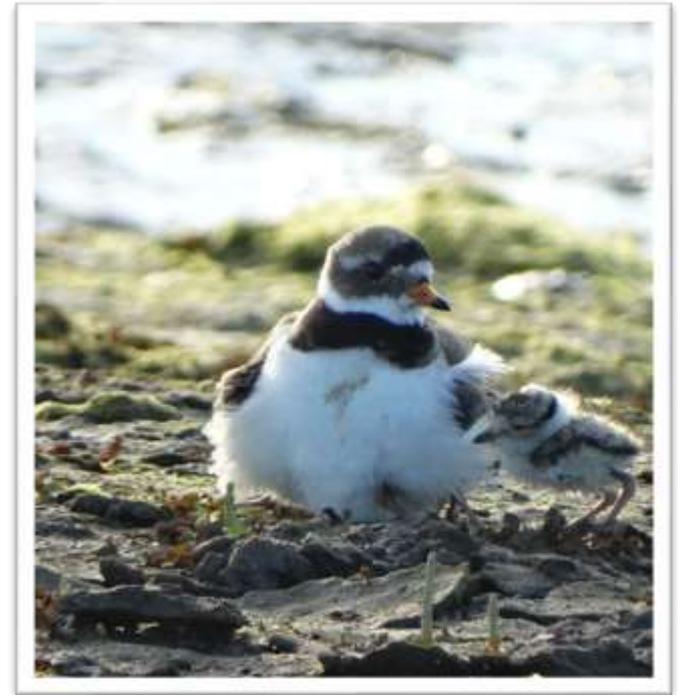
- Two-year project, August 2023 to March 2025
 - Natural England's Species Recovery Programme
 - Approx £240k of public money
 - Located in Hampshire on the North Solent National Nature Reserve
 - Beaulieu Estate + Natural England as project partners
-
- Aims to boost populations of coastal breeding birds through innovative **habitat provision** and **solution trialling** non-lethal predation management techniques





Ringed Plover (*Charadrius hiaticula*)

- Approx 5,450 pairs in the UK (BTO) with 1,688 pairs in England (Conway, 2019)
- In Hampshire, c.165 pairs in 1984 (HOS)
- By 2022, declined to 55 pairs of which 25 pairs at North Solent NNR (HOS)
- Nationally, coastal squeeze reported as the major threat to breeding Ringed Plover





Eurasian Oystercatcher (*Haematopus ostralegus*)

- Approx 96,000 pairs in the UK (BTO)
- <10,000 pairs in England (Brown & Grice, 2005)
- UK amber list: breeding population has declined by 22% (1995-2020)
- North Solent NNR supports the highest concentration of breeding pairs in Hampshire (ca. 40 pairs)
- Nationally, coastal squeeze, changes in shell-fishery management and nest predation considered important



Coastal squeeze

- Habitat loss and degradation
- Human infrastructure and disturbance
- Sea-level rise
- Reduction in suitable shingle habitat for beach-nesting birds
- Predation impacts can be greater where nesting birds concentrate
- Anthropogenic food subsidisation of generalist predators in coastal zones is likely to exacerbate the problem



Southampton
(POP 920,000)

New Forest National Park
- nationally important area
for breeding waders

Bournemouth area
(POP 465,000)



New Forest National Park - human food waste

BBC For you

NEWS

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Food waste keeps high, study says



CETTY IMAGES/LEONORA DATES

Foxes might have less joy with rubbish when...

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ORIGINAL ARTICLE

Evidence of anthropogenic subsidisation of red foxes in a national park important for breeding wading birds

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Abstract
The red fox (*Vulpes vulpes*) is a generalist mesopredator found throughout the UK. It has been linked to national declines in native wildlife, especially ground-nesting birds such as waders. In the New Forest National Park, nest predation and poor chick survival is primarily responsible for low breeding success of Eurasian curlew (*Numenius arquata*), a species of high conservation concern. To reduce predation losses, foxes are lethally controlled by wildlife managers. Here, we identified the major food resources that are being exploited by foxes in the New Forest area and examined temporal and spatial patterns in the presence of specific food categories, with special reference to anthropogenic food. Stomachs from foxes culled in curlew breeding areas were collected from April 2021 – July 2022 and the contents of these stomachs were quantified. Foxes exhibited a highly varied diet with no single food category predominating. Anthropogenic food comprised 14% of the overall diet, with its presence predicted by proximity to human settlements and other infrastructure. We also estimated the total annual volume of anthropogenic food consumed by the fox population and by extension how many individual foxes this volume could support in isolation. According to these calculations, at present the number of foxes subsidised by anthropogenic food is approximately 64.8% (50.2–79.7%) of those removed by culling per year. Our findings highlight that better local food sanitation and education should become important parts of a more holistic management approach to reduce the burden of fox predation experienced by breeding waders.

Keywords *Vulpes vulpes* · The new forest · Diet · Human waste · Breeding waders

Introduction
The red fox (*Vulpes vulpes*; henceforth ‘fox’) is a medium-sized mammalian predator, widespread across North America, Eurasia, and Australia (Macdonald & Reynolds, 2004). Like many aspects of its ecology, fox diet has been the subject of many studies throughout its native and invasive geographic range (Reynolds and Tapper 1995; Diaz-Ruiz et al. 2013; See et al. 2017; Fleming et al. 2021; Castañeda et al. 2022). In broad terms, the fox is defined as a dietary generalist, capable of exploiting a wide-variety of food items including small and medium-sized mammals, invertebrates, birds, plant-based foods, herpetiles and even fish (Castañeda et al. 2022). The fox diet is also highly flexible, with the relative importance of each prey item changing according to spatial and seasonal variation in availability (Leckie et al. 1999; Balserstein et al. 2011).
Although natural prey are more important components of the fox diet from a global perspective (Castañeda et al. 2022), humans can locally subsidise fox populations via unmanaged food waste (Ghosal et al. 2016; Keskarwala et al. 2018), leftover viscera and carrion from hunting (Tobajas et al. 2022; Schwigneman, et al. 2023), livestock, free-roaming game animals, and cultivated crops (DeU’Arte and Leonard 2003; Jacques et al. 2020; Keskarwala et al. 2021), and food left out for pets and wildlife (Harris 1981). Diversionary feeding might also subsidise populations (Kubiszewicz



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North Solent NNR



0 1 Kilometers

North Solent NNR





 Wildlife & Countryside Act 1981
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Climate change



- Coastal erosion, storm surges and sea-level rise speeding loss of shingle habitat
- Linear habitats benefit predators especially at high tide

Ringed Plover – nest camera monitoring



17 C 30.14 inHg

RINGPLOV01

05/13/2022 05:53:42PM

Ringed Plover – nest camera monitoring



RINGPLOV01

05/16/2022 03:00:07PM

Oystercatcher – nest camera monitoring



19 C 29.90 inHg

OYCNEEDS14

06/21/2022 09:11:06PM

Oystercatcher – nest camera monitoring



9 C 29.90 inHg

OYCNEEDS14

06/22/2022 02:21:33AM

Project aims...

1. Create new shingle nesting habitat for waders and terns
 2. Develop and test non-lethal nest protection measures for waders
- For **Ringed Plover**, evaluate performance of nest cages (exclosures)
 - For **Oystercatcher**, evaluate three novel nest protection measures
 - Nest cages (exclosures)
 - Electrified Gallagher 'SmartFences'
 - Intertidal raised nesting platforms



New shingle habitat

- Convert 1.7ha grass/scrub to vegetated shingle
- Non-linear + non-tidal + electric fencing = **lower predation risk**
- Above intertidal zone = more resilient to erosion + sea-level rise
- Functionally linked to shoreline and chick-rearing habitats

- Construct a beach by importing 3,000 tonnes of sea ballast
- Adopt 'experimental' approach to aid future management decisions







Project site
September 2023





Habitat works

PHASE 1

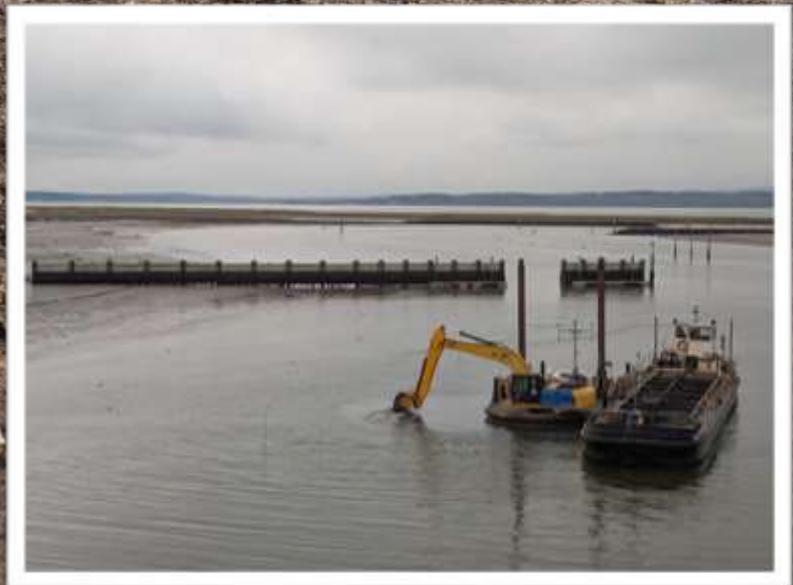
February 2024

Bird breeding season – no works

PHASE 2

November to December 2024





28th February 2024 (end of Phase 1)



200mm

100mm

unscraped

200mm

scraped

100mm

10m² plots along ridgeline

- Cockleshells
- Sea ballast
- 10mm shingle
- 20mm shingle
- 10/20mm mix





Photo credit: Sam Harris

9th April 2024 – ‘unprecedented’ storm surge





September 2024

March 2024

herbicide

Unscraped
85% veg cover

Scraped
10% veg cover



Phase 2
Starts November 2024









4th February 2025



2025 wader nests

- Reserve management team now responsible for project site maintenance
- All habitat management actions mapped
- Technical guide on shingle beach construction to be produced in 2028



Project aims...

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Oystercatcher – nest cages

Design and development

- Measured the body width of 30 adults
- Vertical bars spaced 105mm apart
- Cage = 1m x 1m x 60cm
- 5 lightweight sections
- Outward base to prevent digging

- Fox behaviour towards caged/uncaged baits
- Evidence of neophobia towards cages
- Oystercatchers quickly accepted cages
- Uprights optimally spaced at 105mm apart

Field testing

- Trials in 2023 and 2024
- Cages randomly assigned to oystercatcher nests
- All nests monitored with cameras



Oystercatcher – nest cages



Oystercatcher – nest cages



TTC 30.01inHg

OC2420WSHO

● 05/23/2024 10:37:54PM

Oystercatcher – nest cages



12 C 29.86 inHg

OC2425SEAW

06/04/2024 11:23:06PM

Oystercatcher – nest cages



13 C 29.94 inHg

OC2403WSHO

● 05/19/2024 10:12:54PM

Oystercatcher – nest cage trials

- All adults quickly accept nest cages
- Not predator proof - cages breached by foxes, badgers, hedgehogs
- **Preliminary** nest survival analysis of 62 uncaged and 47 caged nests monitored 2022-2024, shows caged nests 3 times more likely to hatch than uncaged nests

Uncaged nests: n=62

Outcomes: 49 failed, 13 hatched, and no nests abandoned (79%, 21% and 0%)

Daily Survival Rate: 21% (i.e. the nest has a 21% chance of making it through to hatching).

```
*** (r)
# number of nests surviving by day
oyc.results55.CageResultsRealEstimate[1] ~ seq(1,28)
```

```
[1] 0.9453443 0.8936738 0.8448314 0.7986565 0.7550054 0.7137400 0.6747301 0.6376522 0.6029900
[10] 0.5700331 0.5388776 0.5094248 0.4815819 0.4552607 0.4303781 0.4068535 0.3846185 0.3633969
[19] 0.3437243 0.3249378 0.3071761 0.2903890 0.2745176 0.2595137 0.2453298 0.2319211 0.2192453
[28] 0.2072623
```

Caged nests: n=47

Outcomes: 18 failed, 23 hatched, 6 nests abandoned or infertile (38%, 49% and 13%)

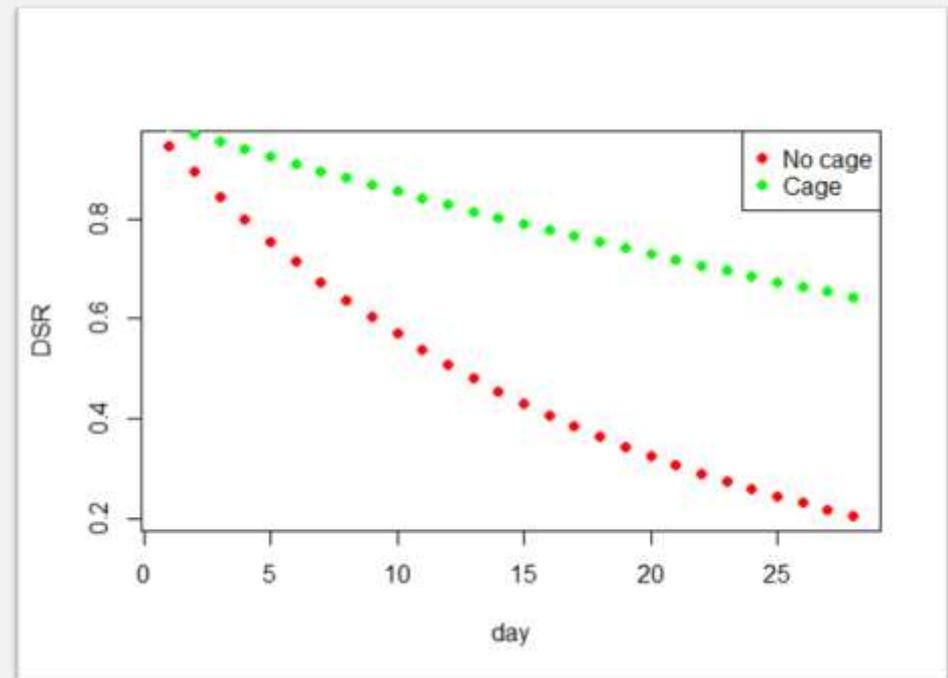
Daily Survival Rate: 64%

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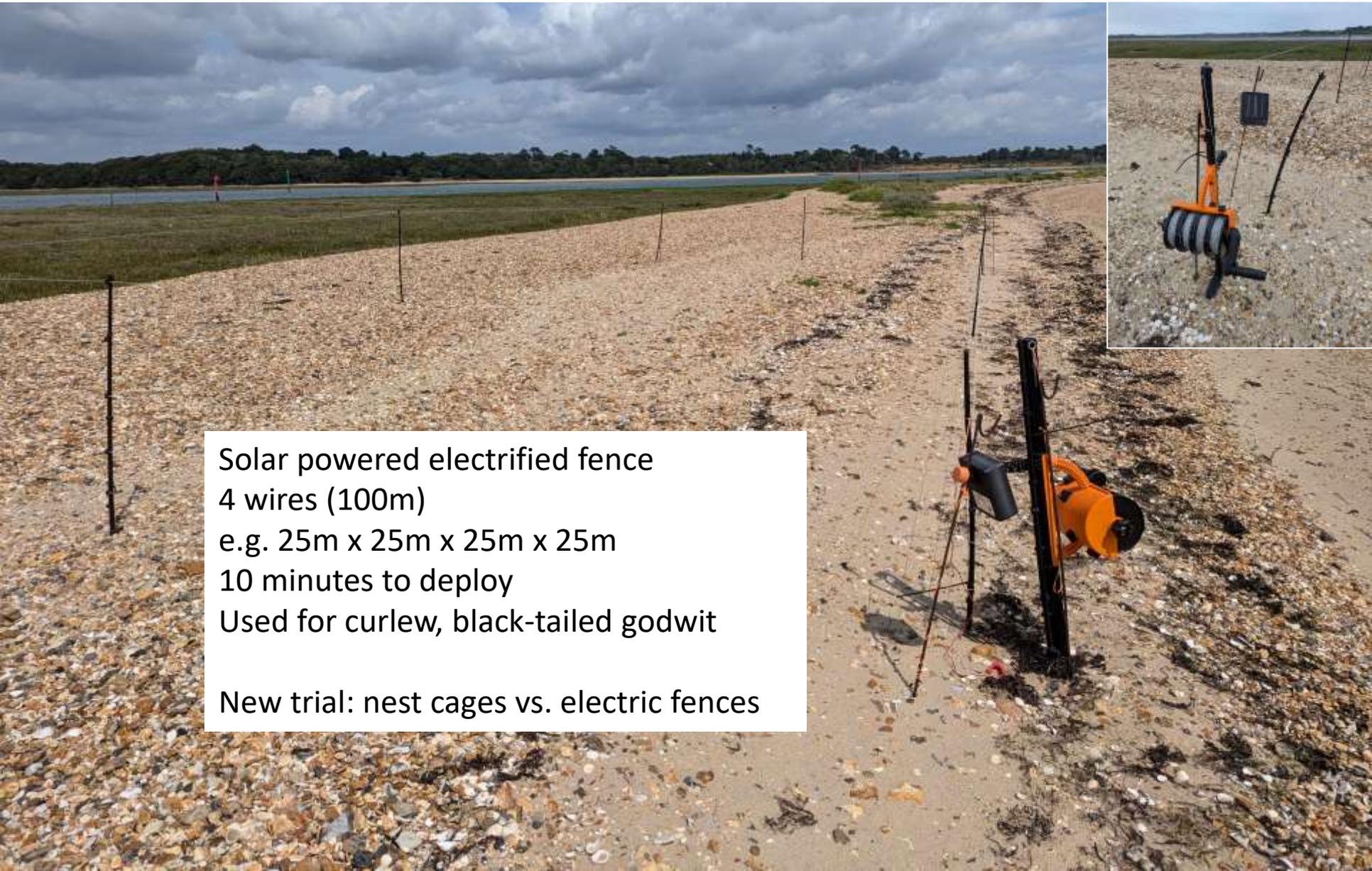
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[10] 0.8543872 0.8410469 0.8279148 0.8149879 0.8022627 0.7897363 0.7774054 0.7652671 0.7533183
[19] 0.7415560 0.7299773 0.7185797 0.7073598 0.6963152 0.6854430 0.6747406 0.6642052 0.6538344
[28] 0.6436255
```

Summary

If an oystercatcher nest is caged it is ca.3 times more likely to hatch than if left uncaged.



Oystercatcher – Gallagher SmartFences



Solar powered electrified fence
4 wires (100m)
e.g. 25m x 25m x 25m x 25m
10 minutes to deploy
Used for curlew, black-tailed godwit

New trial: nest cages vs. electric fences

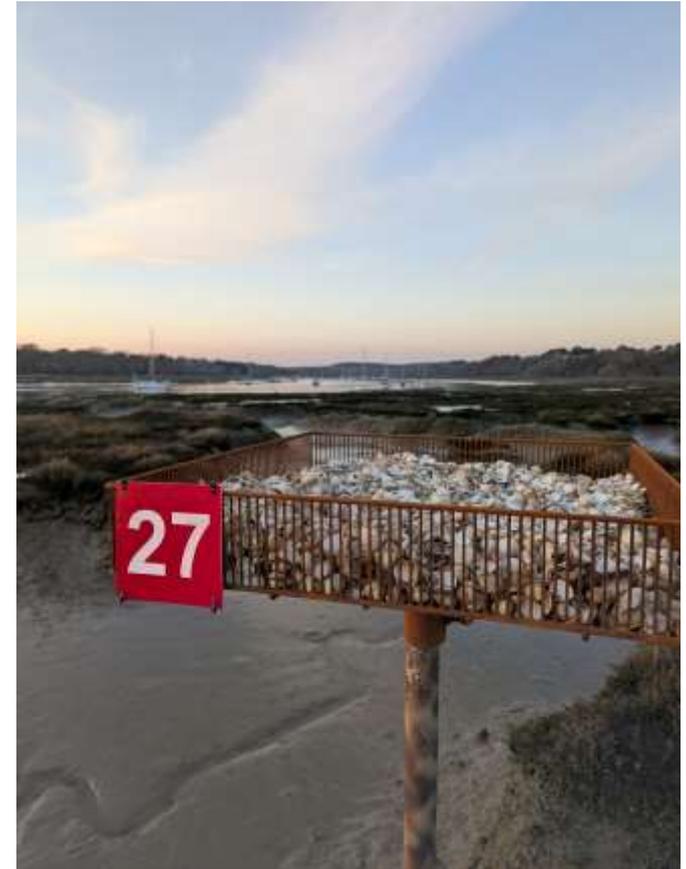
Oystercatcher – nesting platforms



Oystercatcher – nesting platforms

Design and development

- Wire nest basket = 60cm x 60cm x 10mm
- Attaches to scaffold pole = 2.5m
- Basket height = 2m
- Pole supported by 50cm diameter foot-plate
- Numbered for monitoring/engagement
- Nest camera mounts to basket



Oystercatcher – nesting platforms



22 C 30.6 inHg

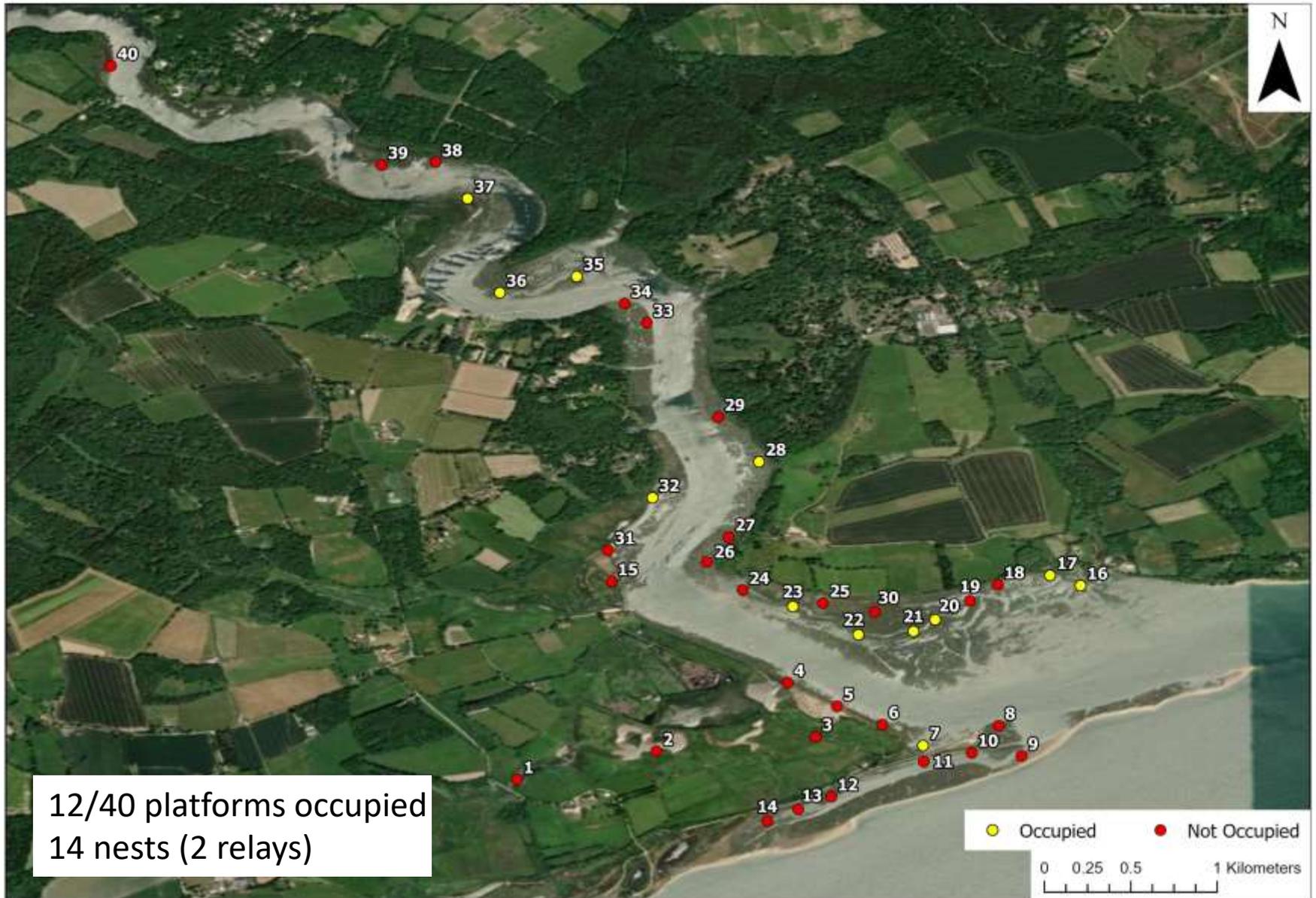
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Oystercatcher – nesting platforms in 2025



Oystercatcher – nesting platforms in 2025



12/40 platforms occupied
14 nests (2 relays)

Oystercatcher – protected nest outcomes in 2025

Preliminary data!

Nest Protection Method	Average clutch size	Nest success rate (nests where 1+ egg hatched/total nests)	Chick hatch rate (total eggs hatched/total eggs laid)	Reason for nest failure
Platform (14)	2.79	10/14 = 0.71	27/39 = 0.69	Predation (1), abandonment (3), infertility (0)
Cage (17)	2.82	11/17 = 0.65	29/48 = 0.60	Predation (1), abandonment (3), infertility (2)
Electric Fence (16)	3.25	15/16 = 0.94	40/52 = 0.77	Predation (0), abandonment (0), infertility (1)





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Oystercatchers and disturbance

2025	Average clutch size	Nest success rate (nests where 1+ egg hatched/total nests)	Chick hatch rate (total eggs hatched/total eggs laid)	Fledging success (fledged chicks/hatched chicks)
Total Protected Nests on Site (47)	2.96	36/47 = 0.77	96/139 = 0.69	15/96 = 0.156
Protected Nests Inside Sanctuary Order (26)	3.08	19/26 = 0.73	55/80 = 0.69	3/55 = 0.054
Protected Nests Outside Sanctuary Order (21)	2.81	17/21 = 0.81	41/59 = 0.70	12/41 = 0.293



Radiotracking chicks: pilot trial in 2025



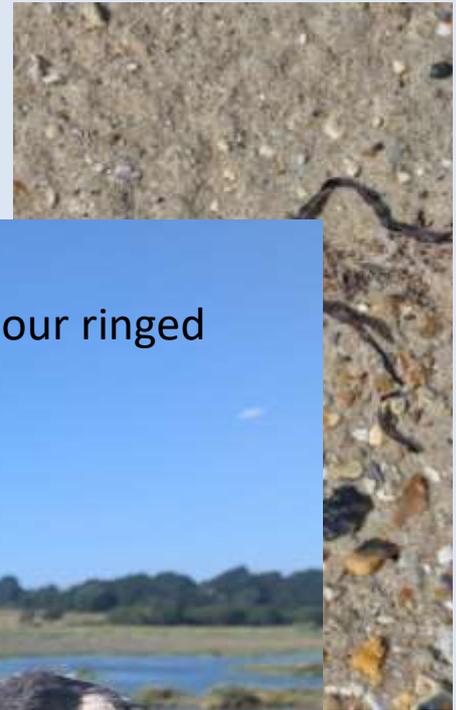
Radiotracking chicks



Radiotracking chicks (locations every other day)

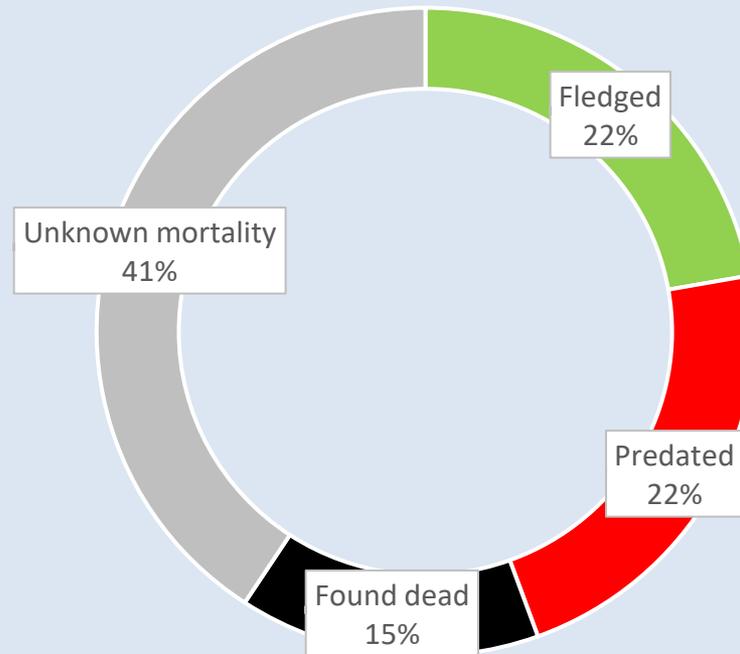


>30 days old, colour ringed



Radiotracking chicks: outcomes

Chicks radio-tagged in 2025 (n=27)



■ Fledged ■ Predated ■ Found dead ■ Unknown mortality

Why do oystercatcher chicks die?

- In 2025, 37 pairs fledged 16 chicks (productivity = 0.43 chicks/pair)
- 85% of hatched chicks (94/110) died within 25 days
- Now developing a 3-year chick survival and chick health study
- Collaborating with avian pathologists (APHA) and marine pollutant specialists



Animal &
Plant Health
Agency

Oystercatcher – nesting platforms

We have lots of research questions!

- Where should platforms be sited to maximise occupancy?
- Does the location within saltmarsh/intertidal habitat influence nest survival?
- Do nesting adults return to the same platform in subsequent years?
- Do chick survival outcomes differ between platform (saltmarsh) and ground nests?
- Do chicks hatched on platforms go on to use them as nest sites?



- Occupied platforms monitored with cameras
- Trapping and colour ringing adults
- Radiotracking chicks
- Colour ringing fledglings

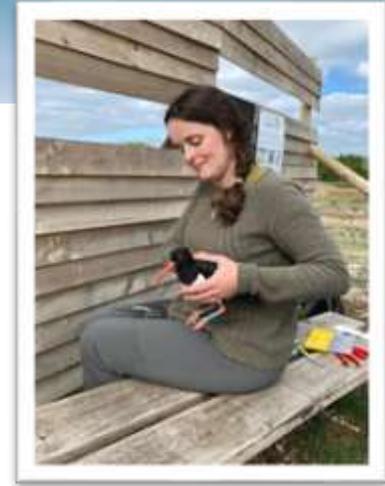


Acknowledgements

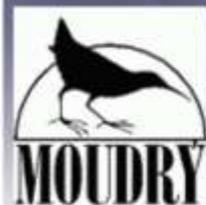
- Lord and Lady Montagu and everyone at Beaulieu Estate
- Adam Wells, Heidi Staines, Chris Button (Natural England)
- Graham Giddens (BTO ringer)
- Perdix Wildlife Supplies

GWCT colleagues:

- Elli Rivers and Rosa Hicks
- Andrew Hoodless, Phoebe James, Matt Cooper, Olly Dean, Ben Stephens



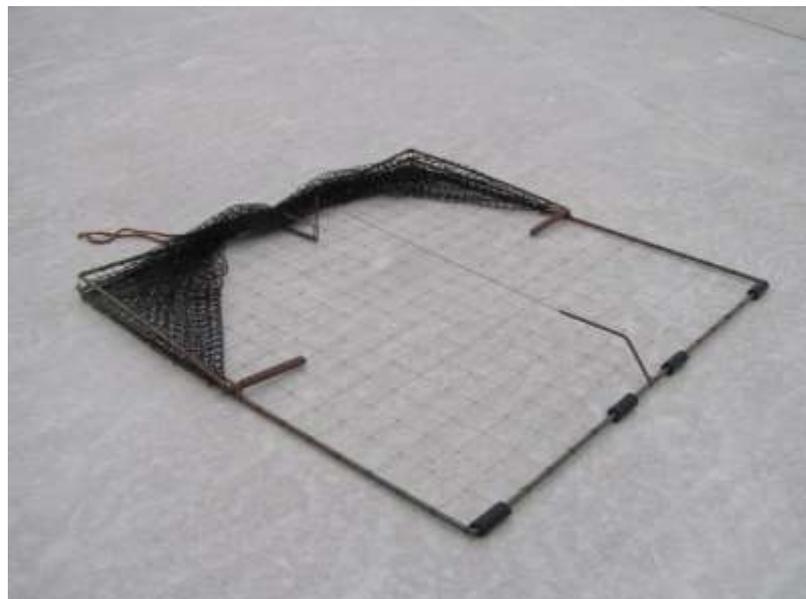




Moudry-traps

Special live bird traps

Many years experience with catching birds for ringing purposes



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[TW45 - Tent spring trap for trapping waders - without a netting bottom.](#)

Base dimensoins: 45x45 cm.

This spring trap is especially suitable in windy conditions when mist nets cannot be used. Upper part specifications: brown polyamide netting, mesh size 14x14 mm Frame colour: dull chocolate brown (RAL8017)
Setting up the trap. It is necessary to use a leading path made of the wire or other netting to lead the bird to the internal space of the trap. Such a netting is not a part of the delivery.

100.70 EUR



Trapping and colour ringing adults



31C 30.12 inHg

0C2556PL28

● 07/11/2025 12:03PM

Trapping and colour ringing adults



29 C 30.12 inHg

OC2556PL28

● 07/11/2025 12:12PM

Trapping and colour ringing adults



29 C 30.12 inHg

0C2556PL28

07/11/2025 12:12PM

Trapping and colour ringing adults

