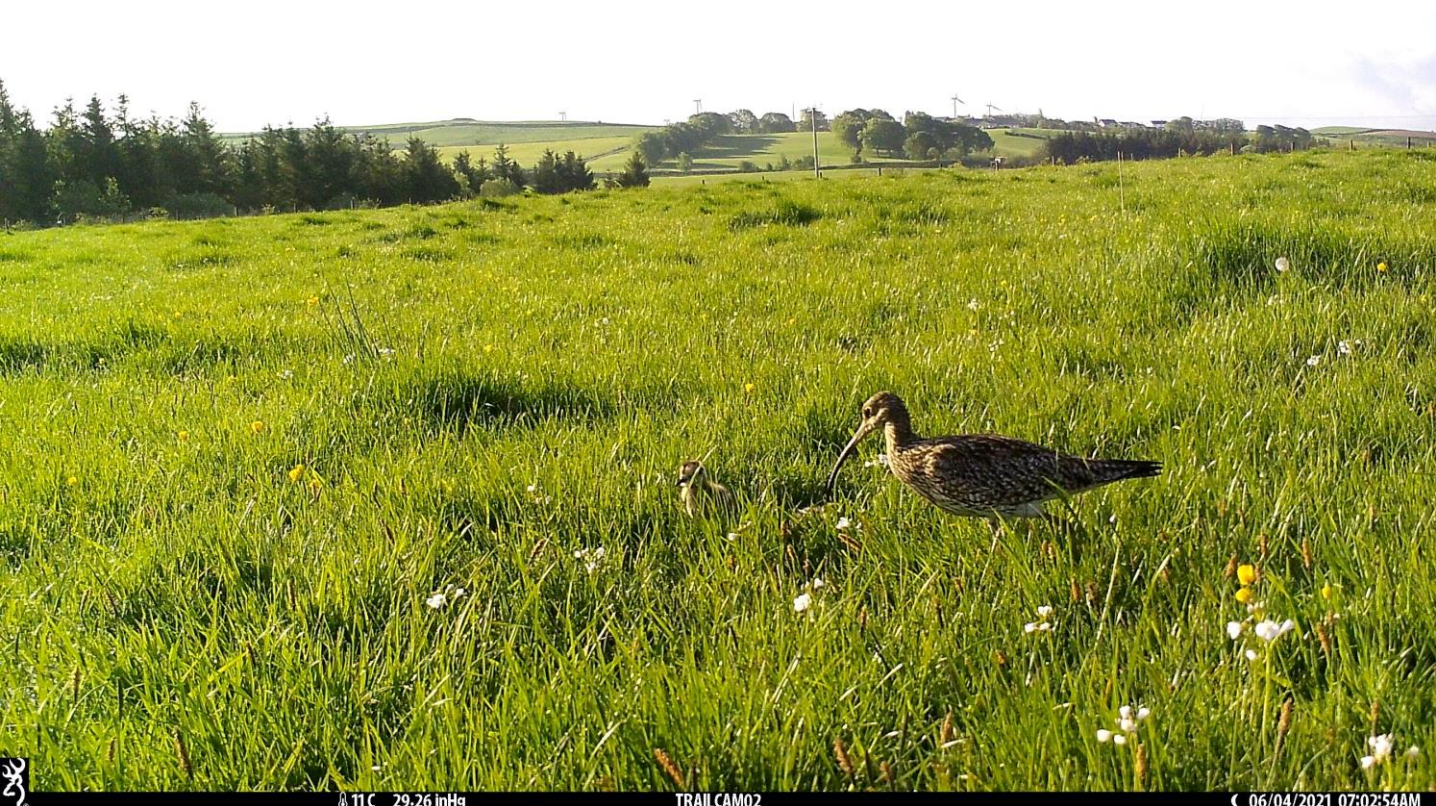
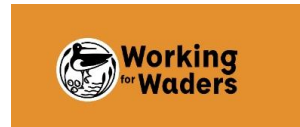
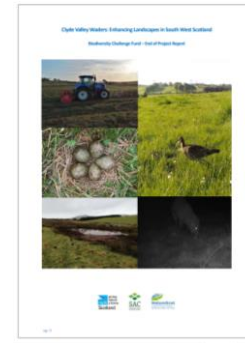


A prescription-based scheme in Scotland:
monitoring its impact on wader hatching
success.



Daniel Brown, Donald McGarrie, Ed Tooth, Yvonne Stephen, Stephen Inglis, Tim Lill, Katie Horton, Lucy McCorkindale, Barry McCorkindale, Connor Smith, Jennifer Struthers, Hazel Laughton & 25 farmers





SCOTLAND



A Visit to Clyde Valley Wader Group

WORKING FOR WADERS • JUNE 16, 2022



Bruce Cooper of Glen Prosen estate watches lapwing chicks near Crawfordjohn



Breeding Success Study - Aims

Build a dataset to answer the following questions -

1. How does hatching success vary in relation to different habitats, agri-environment status and wider land management (forestry, predator management)?
2. What proportion of nests need AE management for population stability? 50%? 75%?
3. Quantify annual change of nest locations & assess implications for 5 year fixed AE agreements?
4. Identify sources of nest and chick loss. Do they vary between sites?
5. Better understand impact of farming practices - are some intrinsically good?

Help inform future AE schemes

Improve AE targeting

Site-specific action plans

Target species – Eurasian Curlew, Northern Lapwing, Eurasian Oystercatcher





AE SILAGE

1 April until 30 June - no rolling, harrowing or grazing

1 Apr – 15 May no lime, fertiliser, slurry or manure from 1 April to 15 May

Mow only after 30 June

Fertiliser restrictions – put farmers off!



AE PASTURE

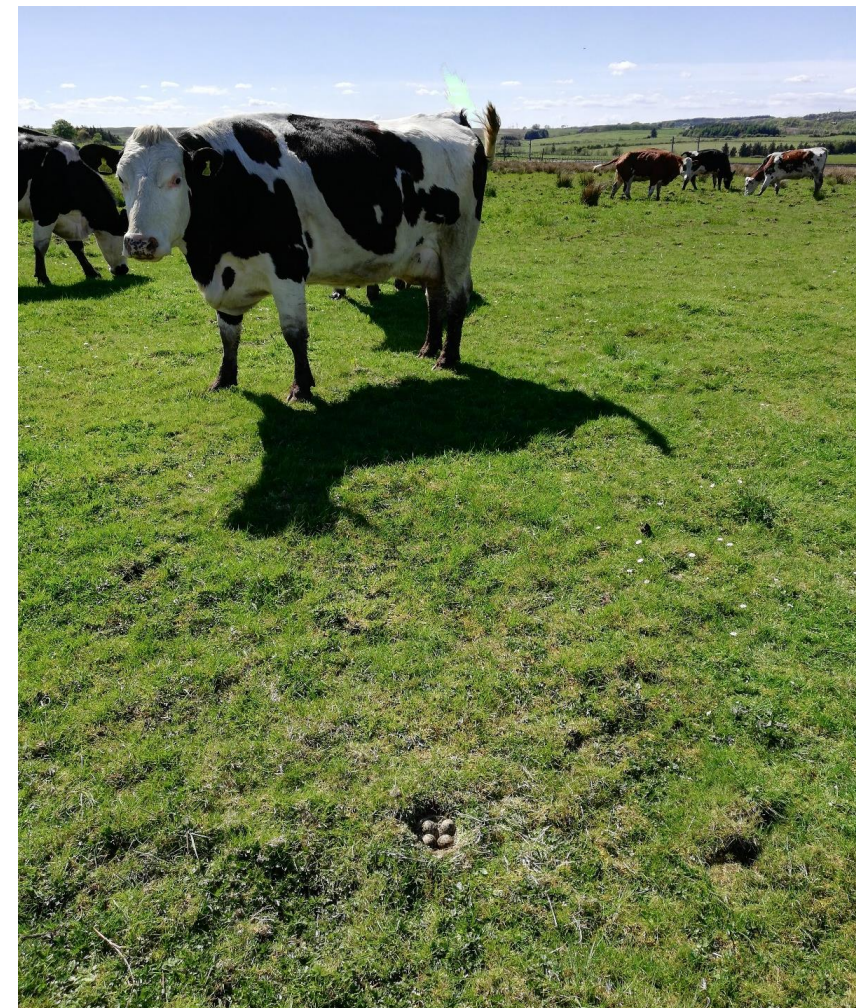
No livestock 1 April to 12 May, or

No livestock 15 April to 26 May, or

Restrict livestock to one LU/ha from 15 March to 15 June inclusive (this is the popular one)

15 Mar – 15 May – no fertiliser

All fine for farmers – very (too) popular option!



NON-AE GRASSLANDS & ROUGH GRAZINGS

No fertiliser or grazing restrictions



ARABLE – SPRING SOWN BARLEY

**No AE option targeting waders
(retain stubbles for seed)**



ARABLE - BRASSICAS (KALE, RAPE, TURNIPS)

Used before grass reseed for up to 2 years
No AE option targeting waders
Sown in late spring

Curlews – don't nest, but like to forage in



NON-FARMLAND WITHIN MONITOR SITES

Quarries, roadside verges, substations (Shingle nests are often within fields and accessible to livestock)

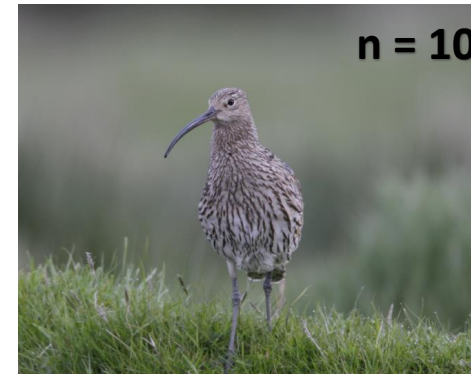
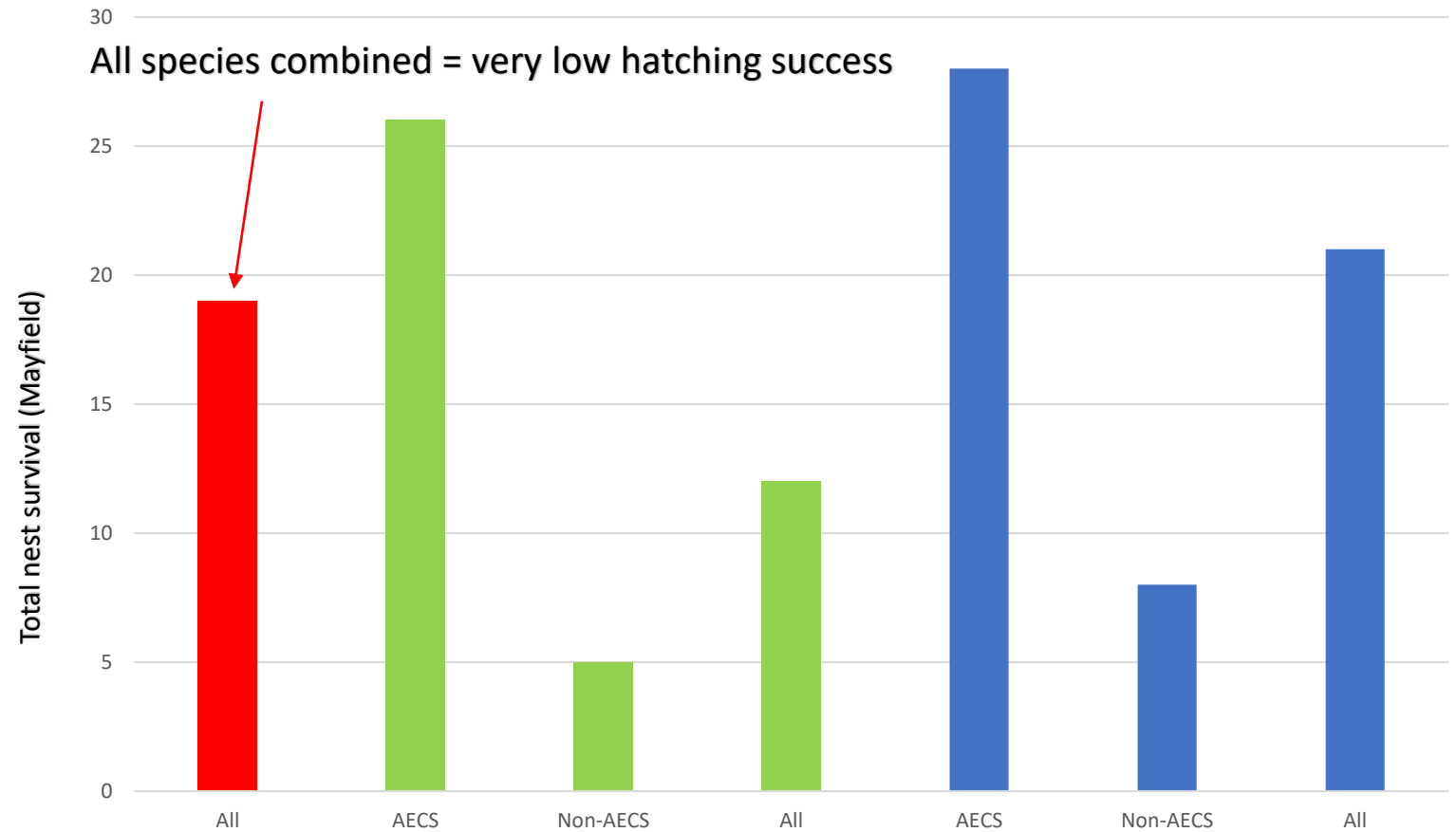
OTHERS – WETLAND AND MOORLAND



- Stephen Inglis' MSc
- Glasgow University/ RSPB
- Duneaton – gamekeeper & AE
- 130 nests in 2019
- Benefits of AE for Lapwing and Curlew detected
- Targeting – wader nests in 60% of AECS fields compared to 20% of non-AECS fields

But!.. Curlew elsewhere

- 36% at Airds (n=12)
- 30% at Tarbrax (n=10)





Study hinted that nests in “AE-silage” fields did best – but we had a small sample size (10 nests).

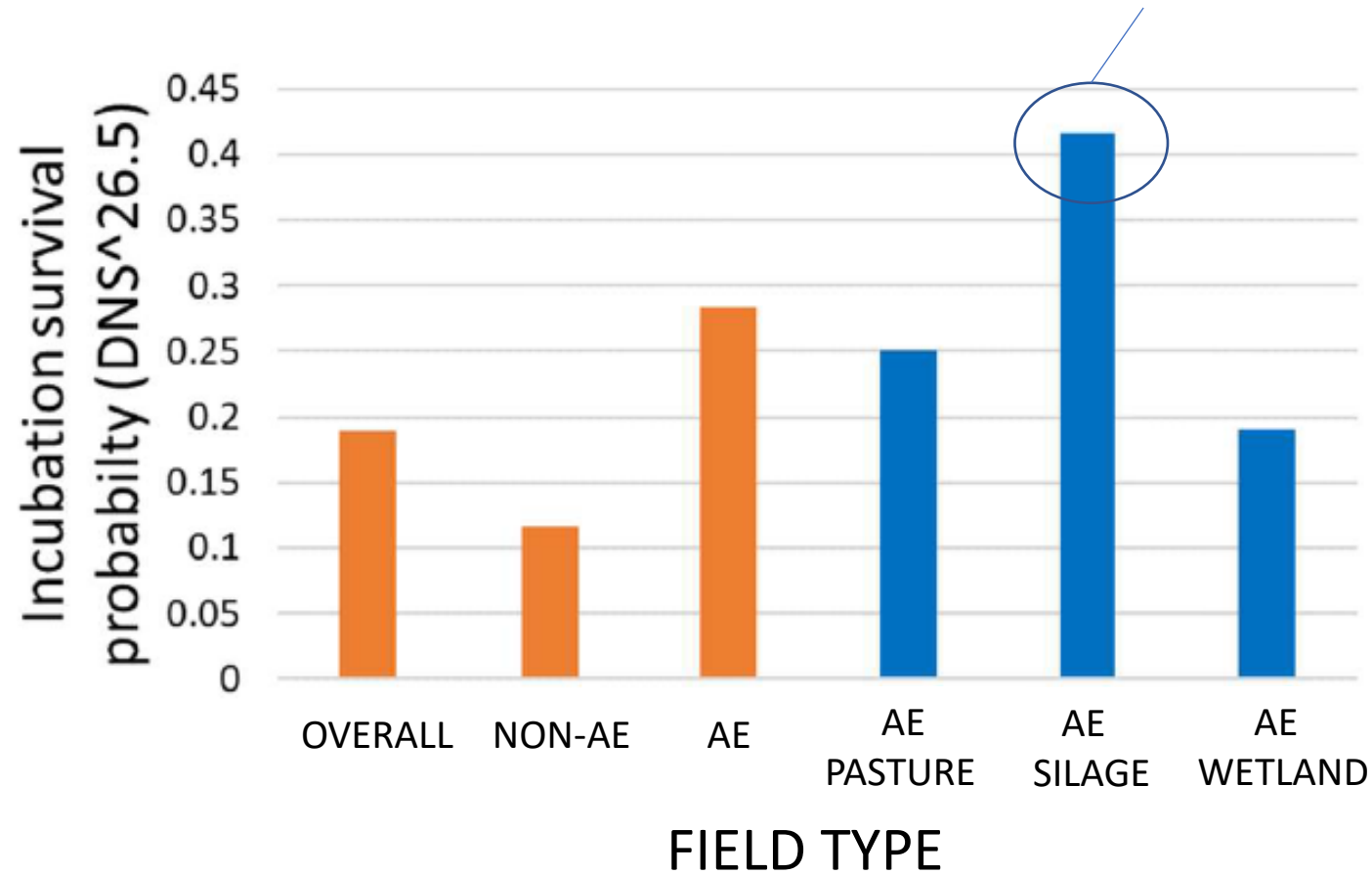


Figure 3. Predicted probability of a lapwing nest surviving incubation, from Mayfield, for different field types (Overall n=77, non-AECS n=21, AECS n=38, WGG n=26, WWMG n=10, WM n=2).

4 Wader Monitor Sites

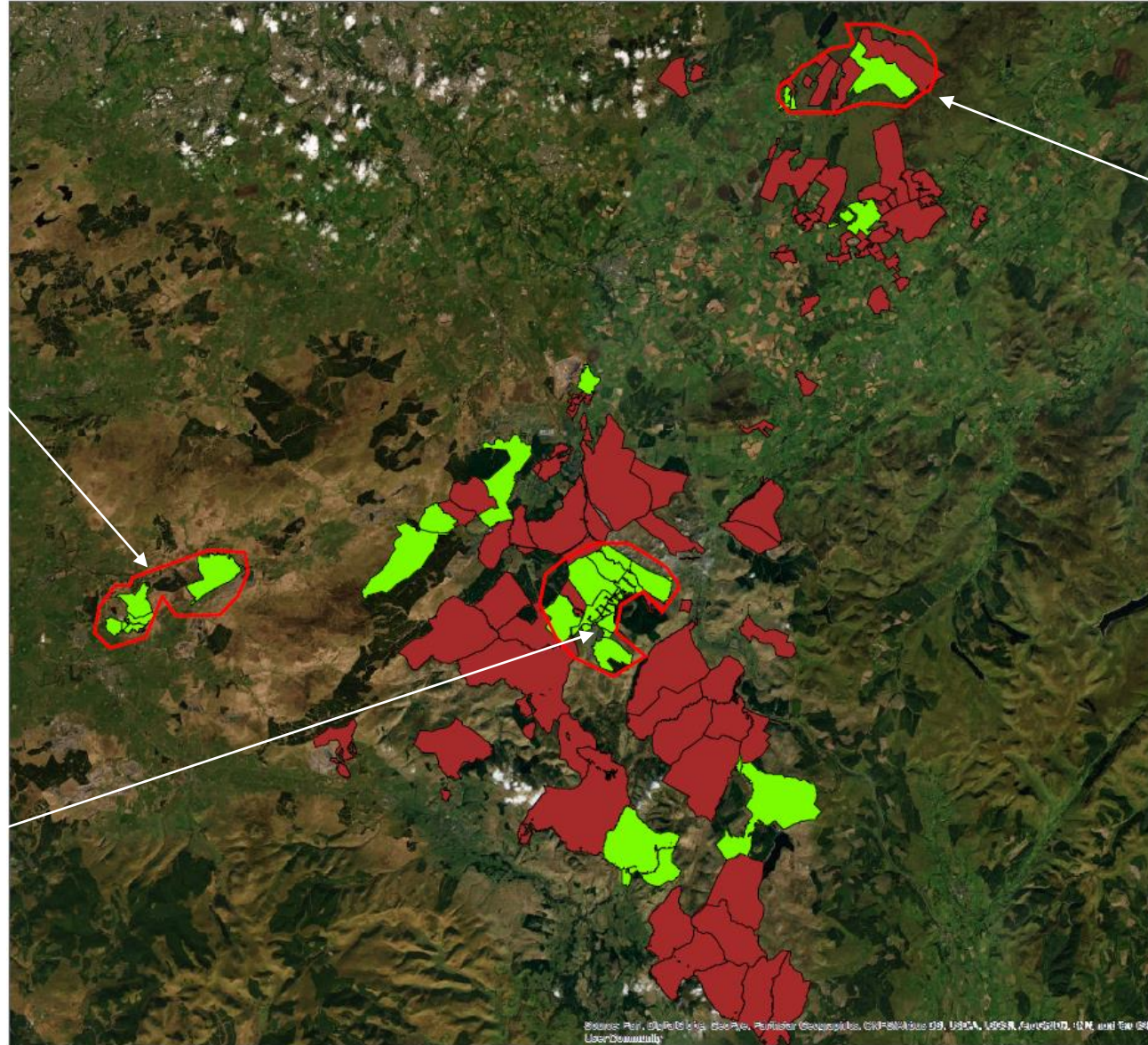
(25 farms, 1 estate, 1 reserve ~150 nests per year (30 Curlew))

Site 1 – Airds

Nature reserve and 2 farms
Conservation predator control
Lots of peatland restoration
75% holdings in agri-environment
25%/ declining cattle activity
No cropping

Site 1 – Duneaton

1 estate and 6 farms
Full time keeper
No peatland restoration
100% holdings in agri-environment
75% / stable cattle numbers
Small-scale cropping (barley)
Plantation



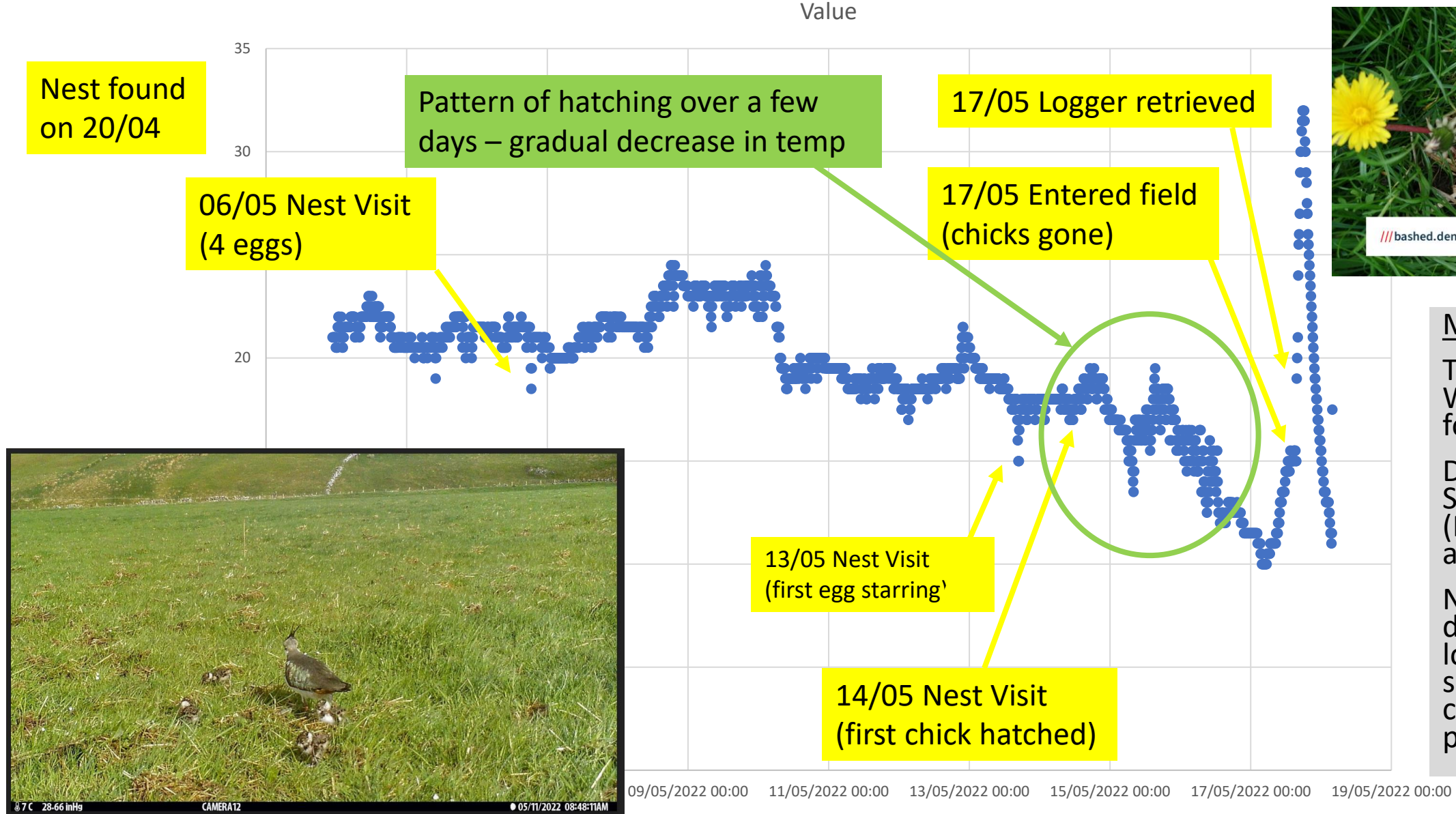
Site 3 – Tarbrax

6 owner occupier farms
No keeping
Medium peatland restoration
Medium agri-environment
50% cattle - stable
Small-scale cropping (brassicas)

Site 4 - Kirknewton

2 farms and airfield)
High density Lapwing
No gamekeeper
Spring barley, green manure, cattle, sheep
0% holdings in agri-environment
Native woodland

Bashed.denoting.triangles – Newbigging Mill – AE - No livestock - hatched



Methods

Temp loggers
What3Words
for location

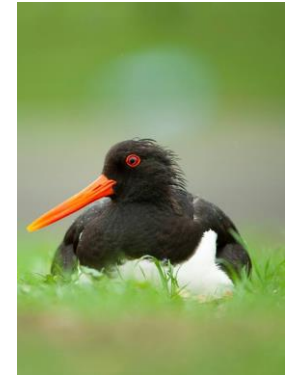
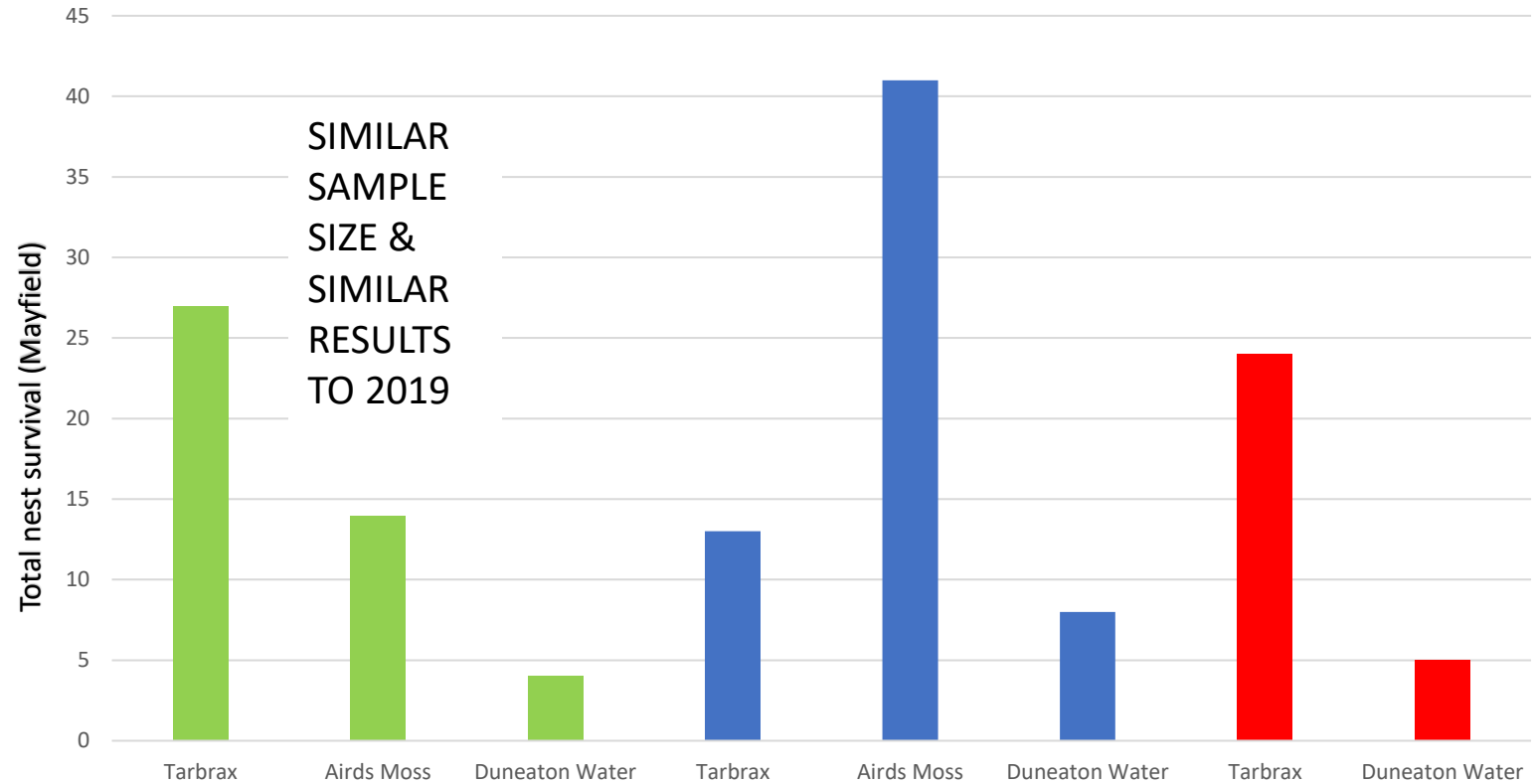
Daily Nest
Survival
(Mayfield) for
analysis

Nest fate
determined by
loggers, field
signs and
cameras –
panel decision

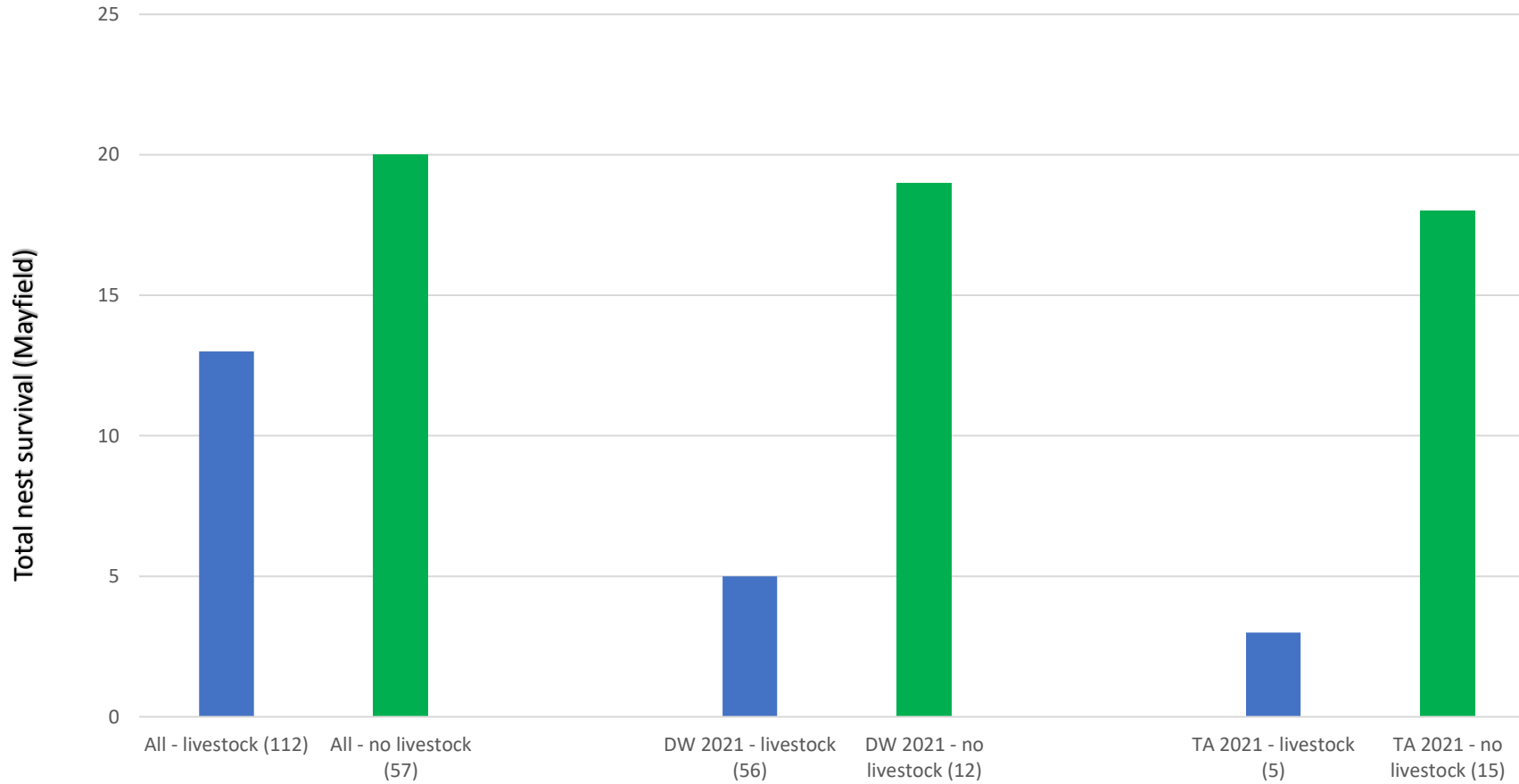
2021 nest survival – v.
cold spring

Surprisingly, Curlew
faring worst at site
with high PC and AE

2022 – data not ready
to analyse yet but
appears to have been
a much better year at
3 out of 4 sites (and
some satellite sites)



2021 total nest survival (all wader species combined) and livestock presence at 2 sites



- ~ 80% of Tarbrax nests were in fields with no livestock at time of laying
- Waders appear to select quiet areas to nest – but livestock are often introduced during incubation

Nest losses – cameras in 2021

	Predation events caught on camera
Tarbrax -2019	None recorded
Tarbrax -2021	Fox (5), Badger (2), Raven(1)
Airds -2019	Fox (2)
Airds -2021	Fox (1)
Duneaton- 2019	Fox (2), Badger (1)
Duneaton- 2021	Badger (5), Stoat (1), Rook (0.25)

Data loggers – 2019 and 2021

80% nocturnal predations – very similar between years and consistent with other studies

Cameras have captured the high degree of livestock disturbance (come and see me if interested)



Even at very low stocking densities, livestock reduce breeding densities of adult Lapwings and increase the risk of nest loss due to predation (Hart et al. 2002 Bird Study)

The study site - 4 marshes with low-intensity grazing (**0.2-0.5 livestock units/ha**) and 4 marshes with without grazing

Nest survival – 34% on the grazed marshes and 64% on the ungrazed marshes

Predation – 58% on the grazed marshes and 36% on the ungrazed marshes

Clutch size – higher proportion of 4 egg clutches on ungrazed marshes

Trampling – only 3 nests trampled on the grazed marshes

Take home message: Nest predation was almost double in grazed areas at 0.2-0.5 Lu/ha, yet our “pasture AE” option is 1 LU/ha!

2022 Update

Data

- 150 nests this year
- More nests in brassicas, spring barley and silage - to boost sample size for these “treatments”
- Finish 2022 data in coming weeks, add to all years - then work with science colleagues to undertake analysis

Incoming 2022 results...

- AE Silage - very high hatching success in “AE – silage” **at all sites** e.g. 7/8, 5/5
- Brassicas – almost all fields support breeding lapwing and oystercatcher. Spring operations can take out initial clutches but extremely high hatching success for replacement clutches was recorded at multiple sites (e.g. 13/14, 5/5, 3/4)
- AE Pasture – lower hatching success - **interaction between livestock, disturbance and predation**
- Curlew - very high fledging success for Curlew at Airds (11/13 successful territories*)
-

Future Plans

Testing Potential Solutions/ Projects

1. “Magic Manure” - Relax fertiliser restrictions (except rolling) to boost uptake of AE Silage option, monitor impact of FYM spreading (and artificial N, lime)
2. “Brilliant Brassicas” - Encourage the reinstatement of small-scale cropping on farms. Curlew foraging.
3. Switch AE fields in response to nest location. Difficult due to bureaucracy!

Monitoring – future priorities

1. Targeted approach to nest finding for the above projects
2. Build resource to focus on improving sample size for Curlew nests?
3. Chicks – clearly critical gap. Some sites/ species easier to monitor than others. Need to decide how we approach this...

Careful communications required!

- Livestock presence driving predation appears to be a key factor in low hatching success. But livestock farming systems are underpinning habitat mosaics and maintain habitats too. We need to articulate this.

Clyde Valley Wader Initiative - hatching success
under different land management regimes



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