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Ecosystems Services at CAFRE Hill Farm, Glenwherry

Department of Agriculture, Environment and Rural Affairs
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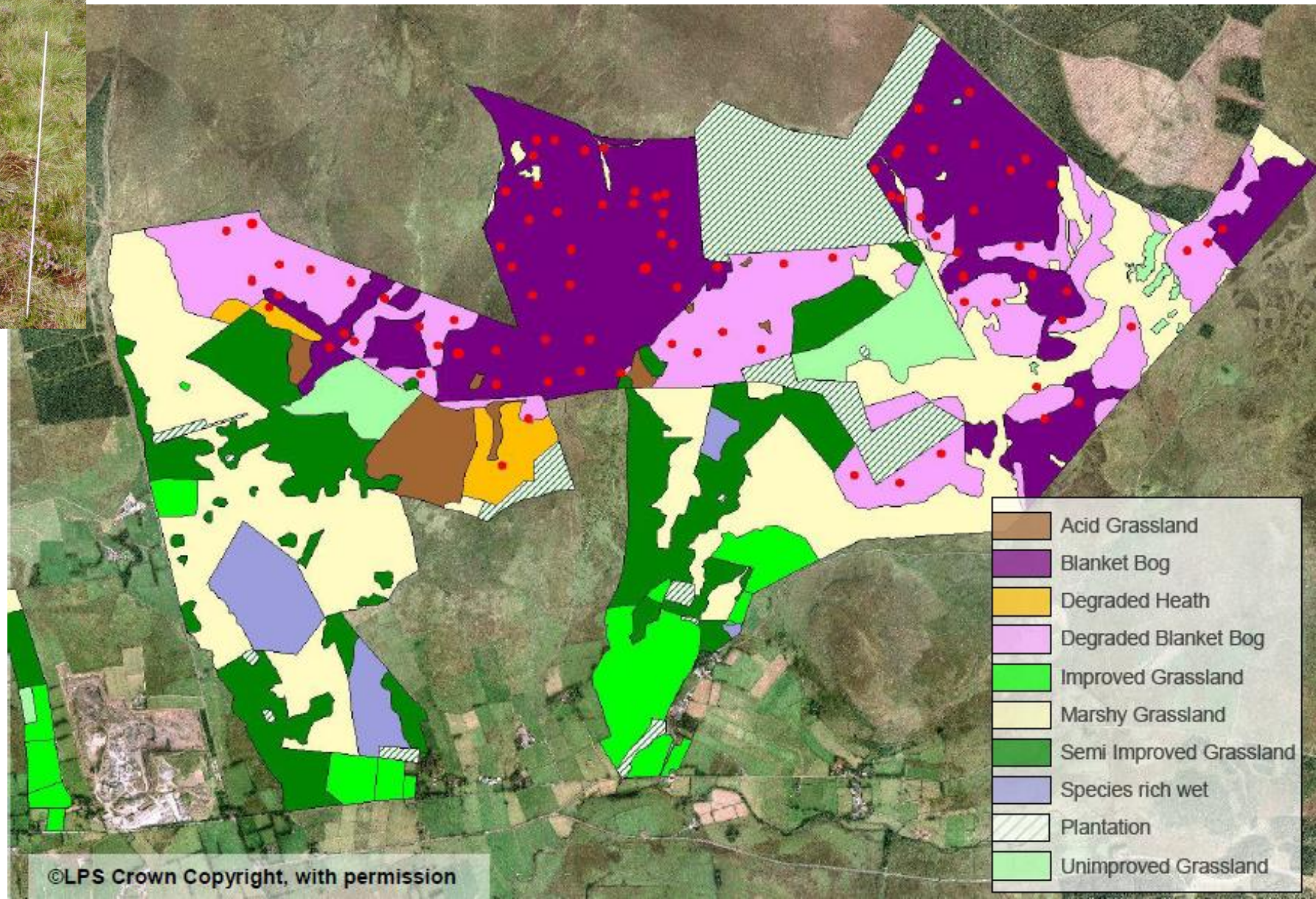
Point
Creeve
Glen
Vogie
Sheep yard
Glenhead
Cattle yard
• 960 ha's
• Peat/Mineral split
• 300-1000ft
• In Bye v Park & Hill
• Killylane Reservoir

Vegetation Classification & Monitoring - Habitat Mosaics



100 Suckler Cows

- 3 breed cross AA, SH, LIM
- Replacement heifers calving@24 months
- Parks – semi-natural grassland

1100 Ewes

- Blackface, Blf x Swale, x Texel
- Performance recorded sires & Genetic selection on ewe/lamb data

Hill Stock Output

Performance		2019/20	2018/19	2017/18	2016/17	Four Year Hill Farm Average
GM/Head (£)*		387	407	375	572	435
DLWG weanlings (kg)		1.2	1.1	1.1	1.0	1.1
Calving Index		366	387	364	362	369
Calf Birth Weight (kg)		42.3	38.9	39	43.1	41
Weaning Weight (kg) - corrected to 200days		272.2	275.5	272	268	272
Cow Weight at Weaning (kg)		661.5	651	649	620	645
Total weaned calf (T)		28856	28655.5	29376	25233	28030
Total cow weight (T)		64836	69696	68796	65757	67271
Efficiency (kg calf/kg cow)		0.41	0.43	0.43	0.44	0.43

		2019/20	2018/19	2017/18	2016/17	Four Year Hill Farm Average
GM/Head		31	31	39	37	30.5
Ewes to the ram		1063	1095	1073	1134	1091
Lambs/ewe/year		1.35	1.22	1.28	1.31	1.29
Lamb birth weight (kg)		4.96	4.72	4.74	4.87	4.8
Lamb wean Weight (kg) – corrected to 112 days		32.14	31.26	31.20	28.41	30.75
Lamb DLWG birth – weaning (kg)		0.23	0.24	0.24	0.21	0.2
Ewe weight at tupping (kg)		59.63	59.37	59.20	58.35	59.14
Total weight lambs weaned (Kg)		46153	41861	42746	42107	43217
Total mature ewe weight (Kg)		63382	65012	63517	66173	64521
Efficiency (kg lamb/kg ewe mated)		0.73	0.64	0.67	0.64	0.67

	2020/2021
Gm/Head	48
Ewes to the ram	1109
Lambs/ewe/year	1.46
Lamb birth weight (kg)	4.88
Lamb wean Weight (kg) – corrected to 112 days	31.15
Lamb DLWG birth – weaning (kg)	0.22
Ewe weight at tupping (kg)	61.18
Total weight lambs weaned (Kg)	50442
Total mature ewe weight (Kg)	67848
Efficiency (kg lamb/kg ewe mated)	0.74

Total output (incl replacements) 71000+kg

Efficiency 0.74 – 0.41

Output per hectare farmed ~75-80kg (Range 10 - ~500kg)

Comparison with CAFRE lowland hectare ~1000kg

Hill Biodiversity Output

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Glenwherry Hill Regeneration Partnership (GHRP)

Phase 1; 2009 – 2014, Phase 2; 2015 – 2020, Phase 3; 2021-2025

Develop, implement and promote sustainable habitat management practices on Greenmount Hill Farm and adjoining farms;

Meet the needs of the wide range of habitats in tandem with sustainable livestock production

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afbi Agri-Food and Biosciences Institute

Irish Grouse Conservation Trust

rspb giving nature a home

NIEA Northern Ireland Environment Agency
www.ni-environment.gov.uk

Northern Ireland Raptor Study Group

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

Glenwherry Hill Regeneration Partnership GHRP

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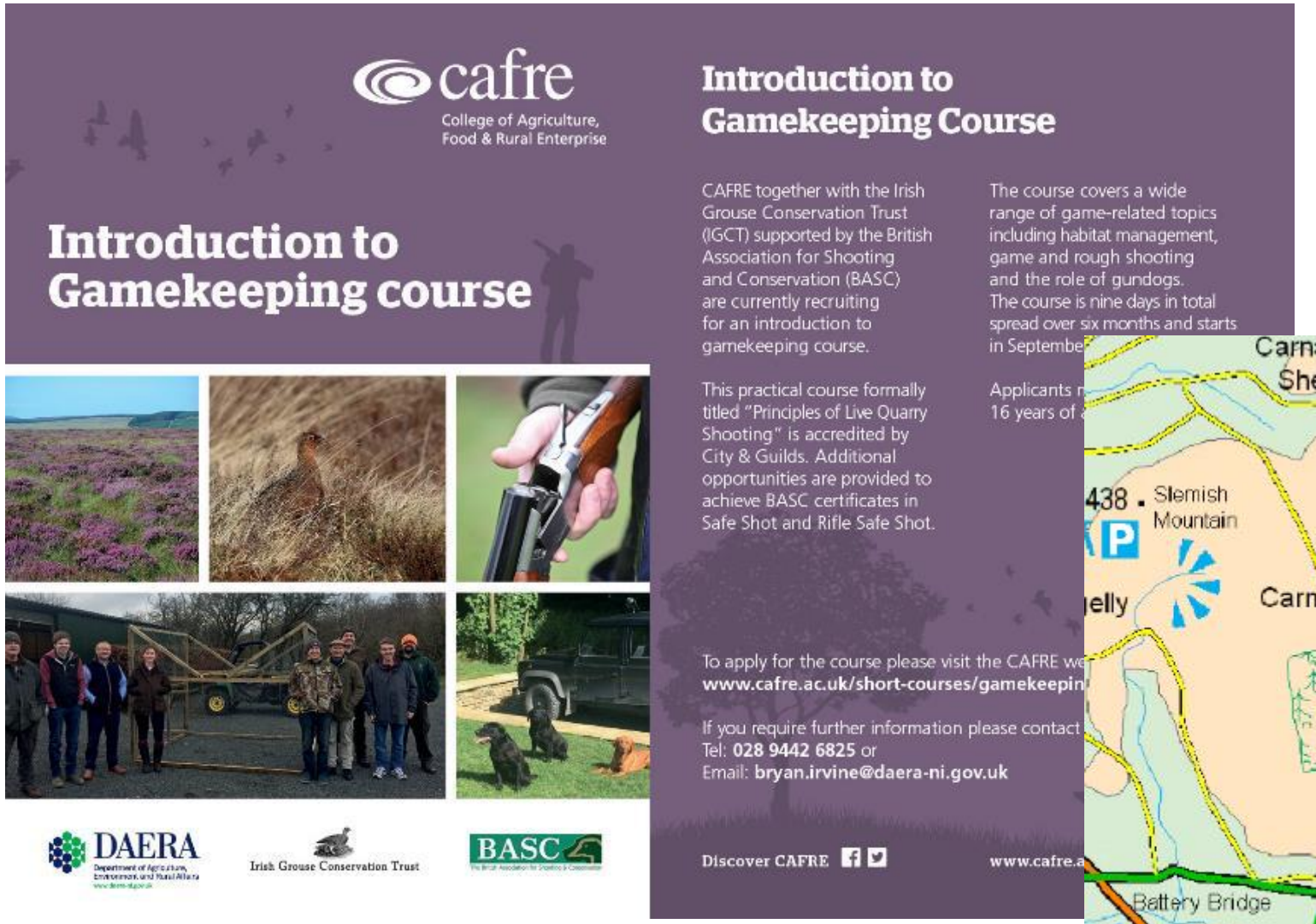
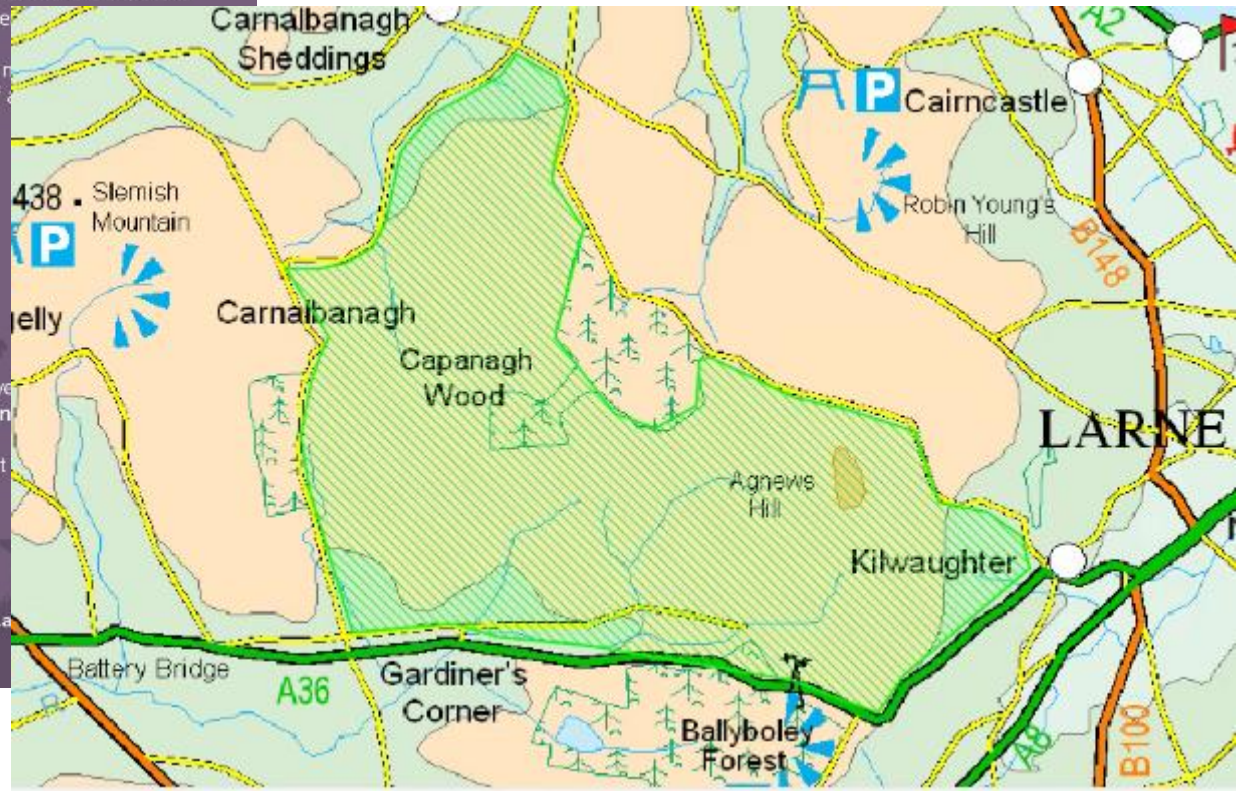
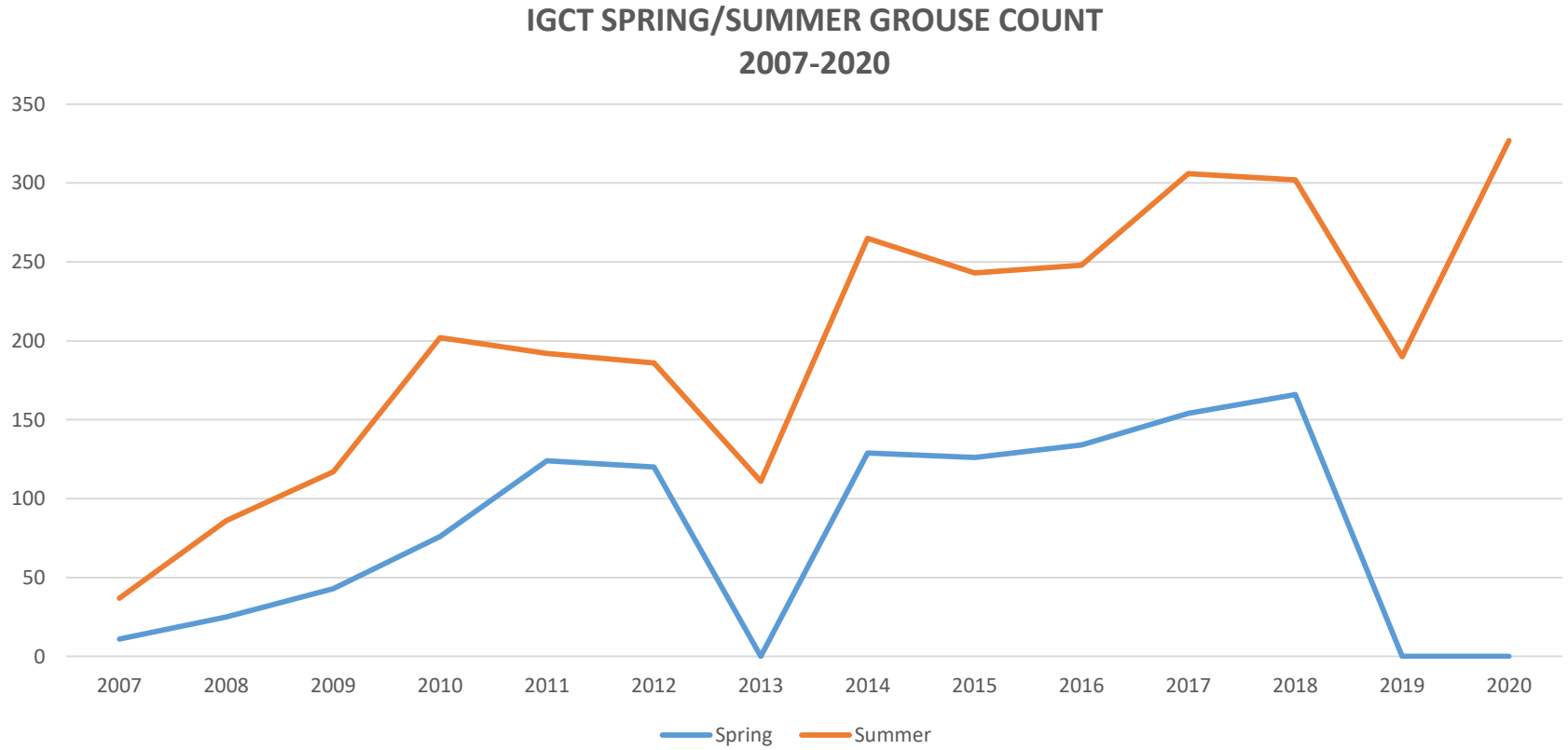


- Predator Control Methods & Area
- Nature Recovery Area
- Associated RSPB project



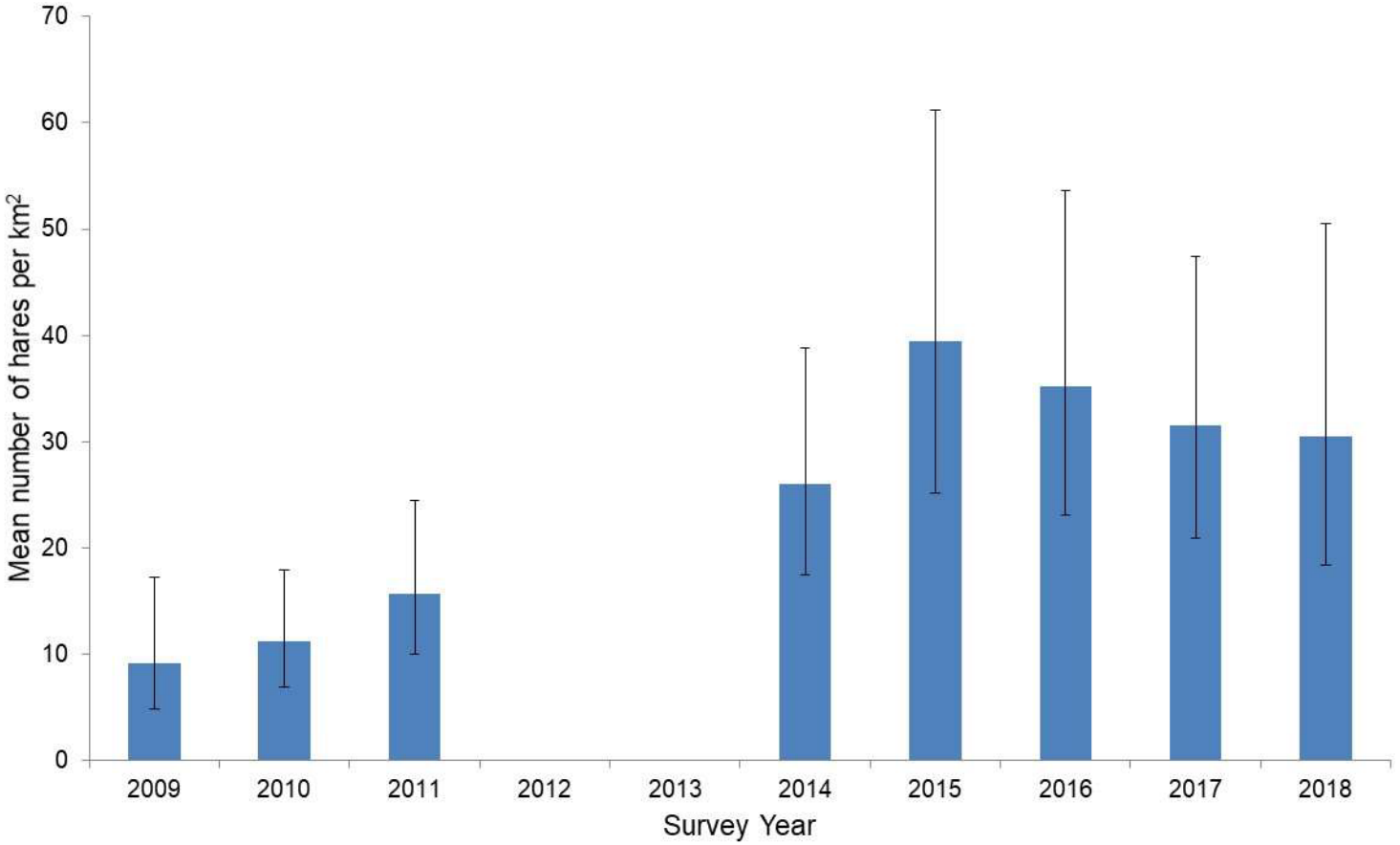
Red Grouse

IGCT – Purdey Gold Medal
- for red grouse & other ground nesting at risk species



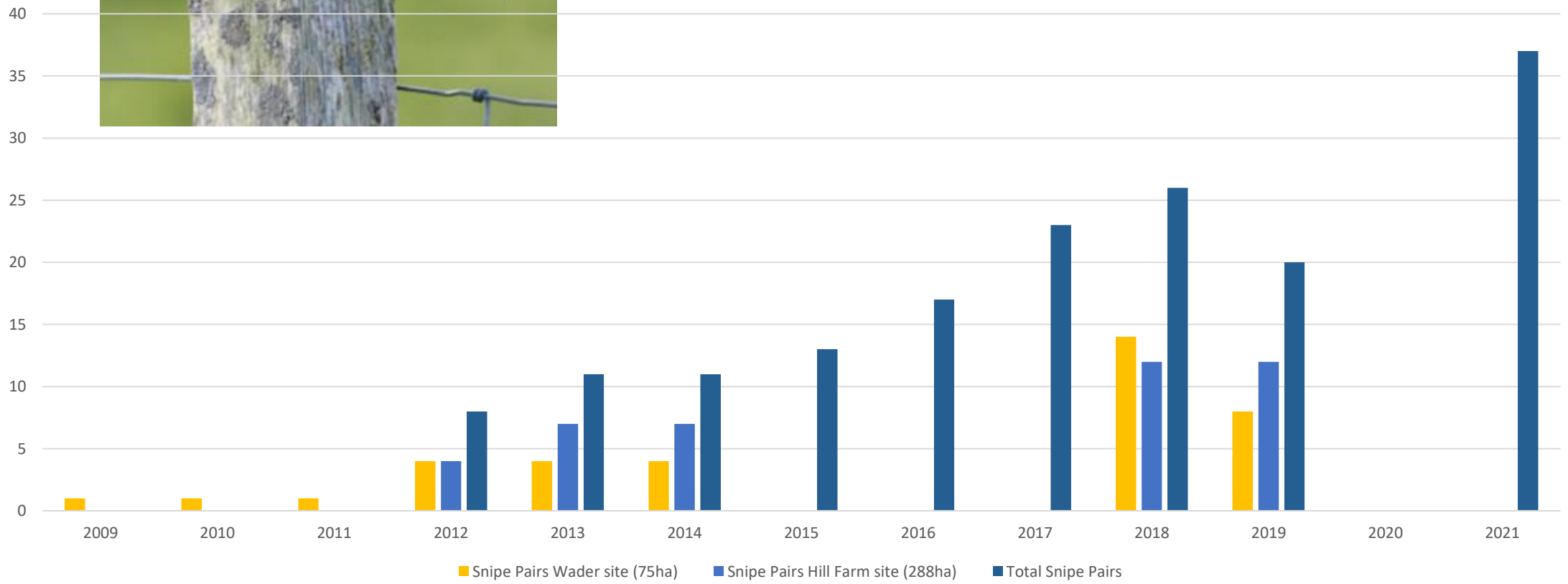
Irish Grouse Conservation Trust

Mean density estimates (with 95% CI) for Irish hares in Glenwherry study site.



- Predators
- Habitat heterogeneity
- Irish average 2006-2007 3.3 – 7/km2

Photos. I.Montgomery


CAFRE Hill Snipe Pairs 2009-2021
40
35
30
25
20
15
10
5
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Snipe Pairs Wader site (75ha)
Snipe Pairs Hill Farm site (288ha)
Total Snipe Pairs

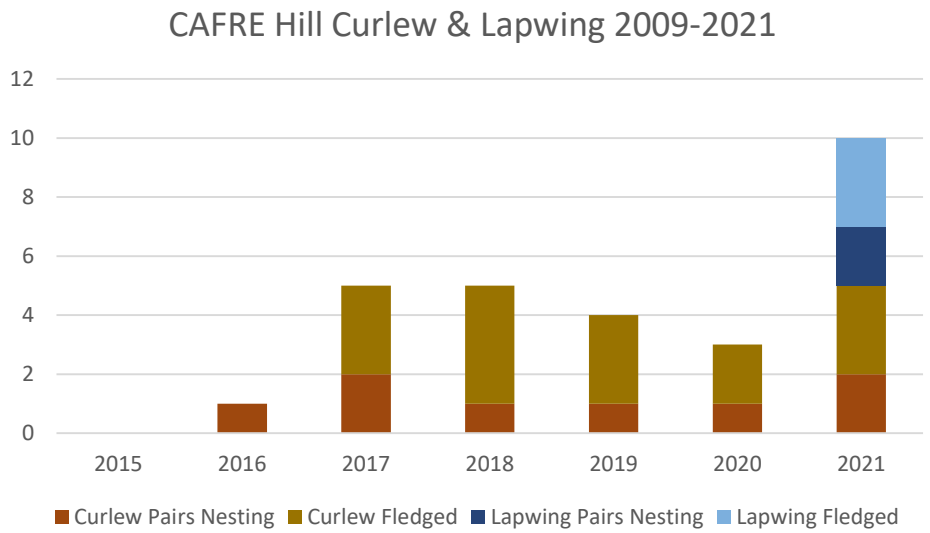


Photo courtesy of Neal Warnock

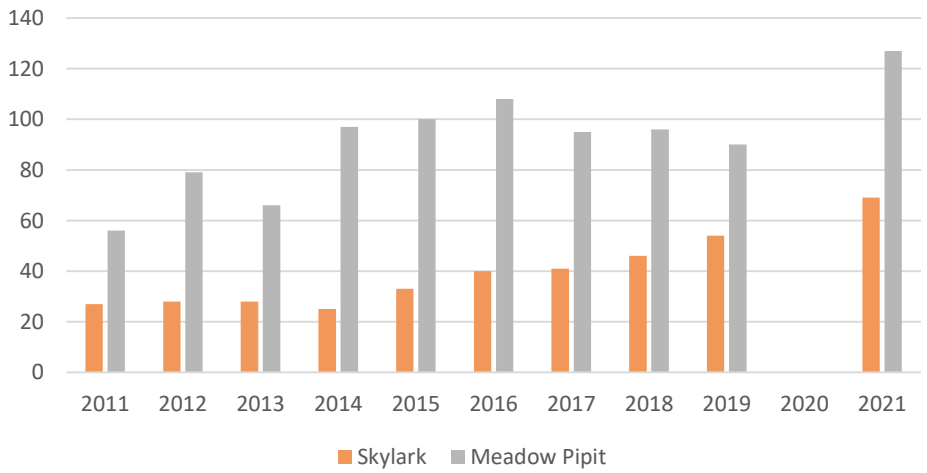
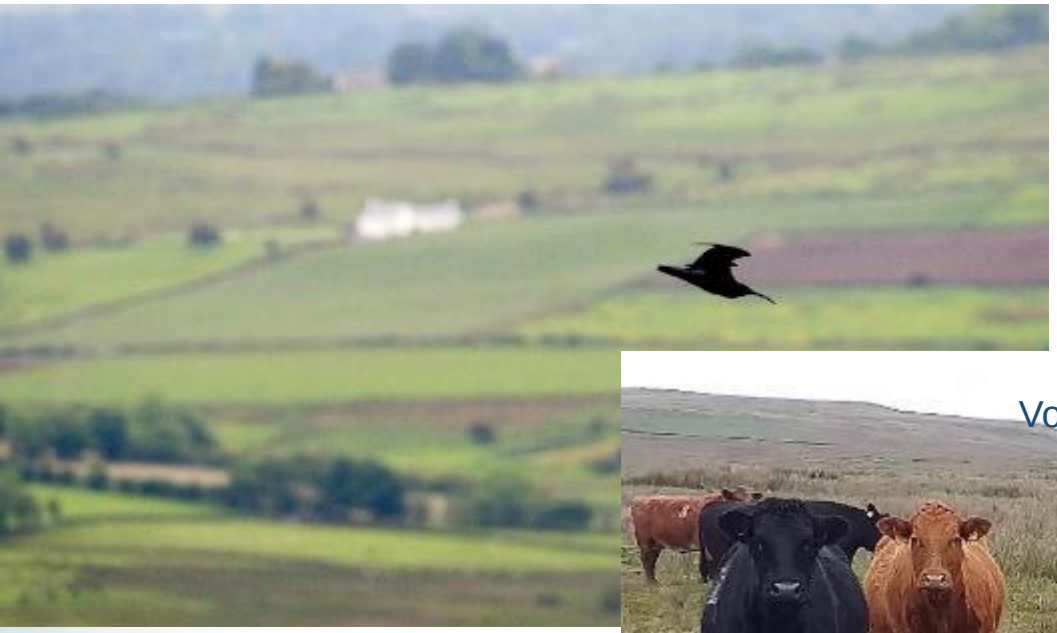


Photo courtesy of Michael Latham

Breeding Wader Site



Vogie Wader Unit – 17/11/21, slim club

Creeve Park – Feb 2021 Provision of multiple water sources - mineral soil scrapes & moorland dams

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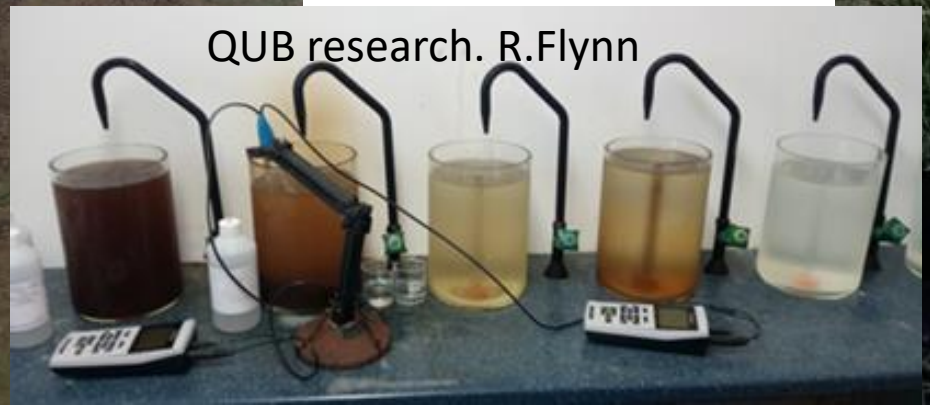
Water Quality (Colour – DOC)

Treatment cost/ha ~£90 pa

(R.Flynn & students QUB)



QUB research. R.Flynn

Creeve Moor Nov 2021 – “relatively” intact moor treatment cost ~ £18/ha

Flood Alleviation

Example - 5mm precipitation event in November

Heavily modified site of low water table, high storage capacity

VERSUS

“minor modified” moorland of high water table, low storage capacity

Time	Deeply & Intensively Drained	“Relatively” Intact Bog
Hours to reach peak flow	2	15
Hours to return to base flow	25	72

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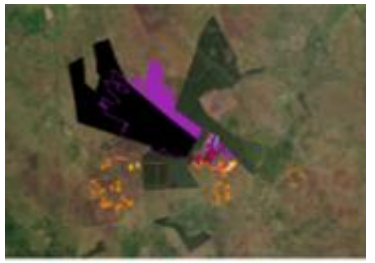
Wildfire Prevention

- Response Plan
- Prevention Strategy
- Grazing control & cutting, burning, firebreaks, re-wetting



Heather Resource Map
by bellja@NIGOV
Created: 30 Sep 2021
Updated: 26 Oct 2021

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Service Information Note

No. LD-IN-
Document Overview

Wildfire response Plan - Glenwherry Hill Farm

The following areas are covered by this document:
- Contact names and telephone numbers
- Communications
- Rendezvous points
- Important hazards
- Access points
- Water supplies
- Equipment
- Priority protection areas
- Neighbouring landowners
- Helicopter authorisation
- Audit, monitoring and quality assurance
- Data Protection Act 2018 - privacy statement
- Further documents
- Appendices 1, 2 and 3 - Wildfire Fire Plan Maps

Document Control

Version	Date	Author	Reasons for Change
001		Colum McDaid Robert Beggs	New Document
002			

Sign-Off List

Position
NIEA : Wildfire Officer
CAFRE : Farm Director
NIFRS : Wildfire Officer

Approved By (to be completed by author)

Department	Req ([])	Date
NIEA		
CAFRE		
NIFRS		
Other		
Comment	Dept. Manager (Info Note)	

Readership

Personnel	
Operational	☐
Non-Ops	
Non-Ops with Ops Reference	☐
Fire Control	☐
NIEA	

Risk Assessment

Completed ([])

Equalities Impact Assessment

Completed ([])

FOI Exemption Required?	Yes		Reason
	No	☐	

Security Level	N/A

Review Date	1/10/2021

Version 001 (Review 01.2023) Page 1 of 4

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Peat Carbon Storage

QUB Archaeology /Paleoecology; carbon dating layers ~last 500 years

1m depth peat ~ 400t/ha C , ~ 1468 t/ha CO2 eq
Peat C storage at Cafre ~ 1 – 2million t CO2 eq

Peat Bulk Density refs 0.06-0.16g/cm3
C~51-55% of peat BD

10000m2 @ 0.07 @0.51 =357 tC /ha
As C – CO2 eq = 1310 t /ha

Cafre Hill Farm
440ha @ 2m depth (1-4m)
250ha @0.3m depth

~950x 357 = 339150 t C
~1,245,000 t C/CO2 eq

@0.11BD ~ 0.55 = 605 t C/ha
~950x 600 = 570,000 t C
~2,000,000 t C/CO2 eq

CAFRE Carbon Zero Target

Hill Farm C Budget

- Livestock emissions
- Mineral soil C sequestration

- **Peatland emissions** versus Peatland Accumulating Condition
- **~3000 t CO2 eq**

(IUCN UK Peatland Emissions Factors & UK Peatland Code Protocol)

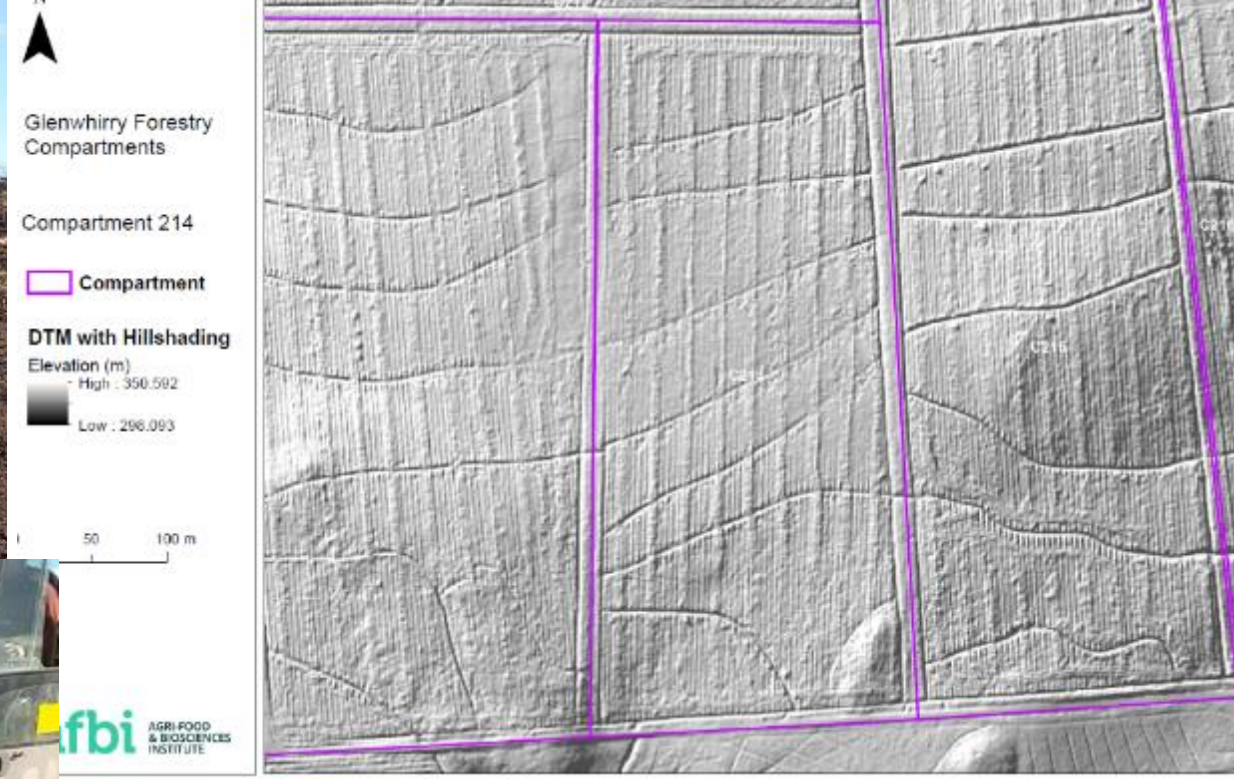
Forest to Bog

1. **Minimise emissions.** **9.91t CO2eq/ha**
2. Return to PAC Peatland Accumulating Condition (WTD)
3. Invertebrate & bird habitat – removal of predatory radii
4. Wildfire control

Why? - Protect C store for current & future weather, Water Quality, C sequestration, Biodiversity, Wildfire prevention.

Forest to Bog (57 + 5 + 2)

214 - Jan 2021 Forest to Bog



214 – “Dry” July 2021. Forest to Bog

Value of utilising furrow vegetation

212 Lodgepole - Oct 2021.

40 year old mole drains, trenched, dammed & bunded.

Rewetting open moor

1. **Minimise C emissions.** **10cm reduction WTD = 3 t CO2 eq**
2. Aim for PAC Peatland Accumulating Condition (WTD)
3. Maintain vegetation cover & control by WTD, grazing or other.

Why? - Protect C store for current & future weather, Water Quality, C sequestration, Biodiversity – multiple water sources, Wildfire prevention.

Feb 2021 Creeve Moor – using peat pipes to create water sources & raise WTD.

April 2021 Creeve Moor – WTD, Water Quality, Multiple water sites for birds

Front Point April 2021 - Rewetting Open Moor

Emissions Factor 3.4 T CO2 eq/ha
WTD reduction 10cm = 3 T
Summer v Winter
Control v Demo > 10cm

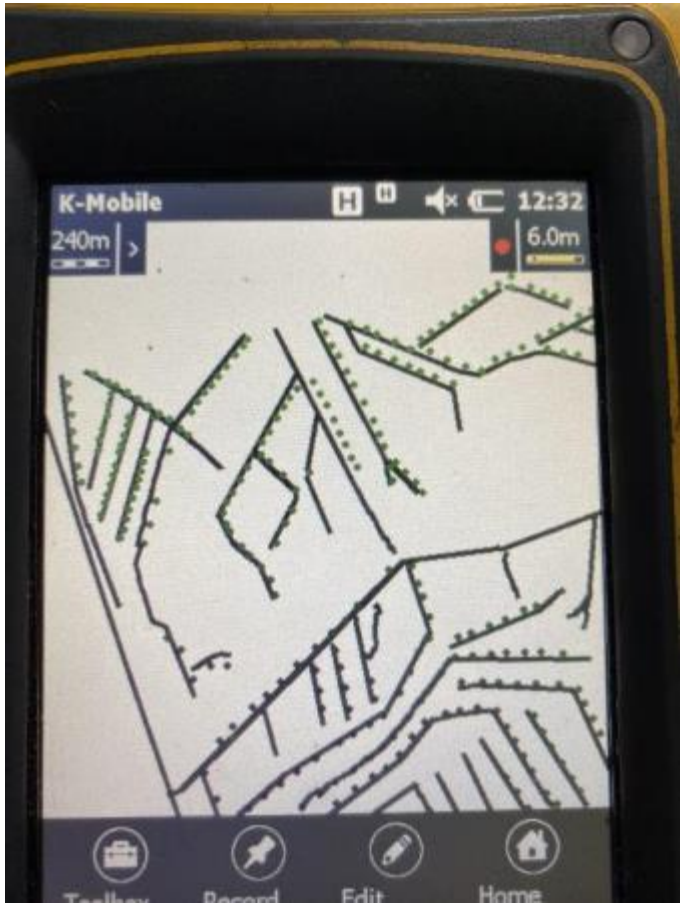
Front Point – Dec 2021

Peat dams
Plastic insert
Plastic piling
Wood

Main drains
- Timber waste

- **Check emissions factors by monitoring fluvial & gas C losses**

(QUB, UU, CEH)



CAFRE HILL FARM OUTPUTS

Livestock
Biodiversity
(1. the site
2. As a Nature Recovery Area to spill over)
Water Quality
Flood Alleviation
Carbon Storage
Wildfire Prevention
Carbon Sequestration

Activities

Education
Technology
Demonstration
Monitoring &
Research site

Environmental Measurements

- Wader, passerine, grouse, raptor, hare counts.
- Water Quality
- Flow discharge
- Carbon fluvial losses
- GHG Flux
- WTD
- Vege analysis – PAC
- COSMOS Weather station

Research Partners
QUB, UU, Afbi, CEH