

# Ecosystems Services at CAFRE Hill Farm, Glenwherry





Point

Creeve

Glen

Vogie

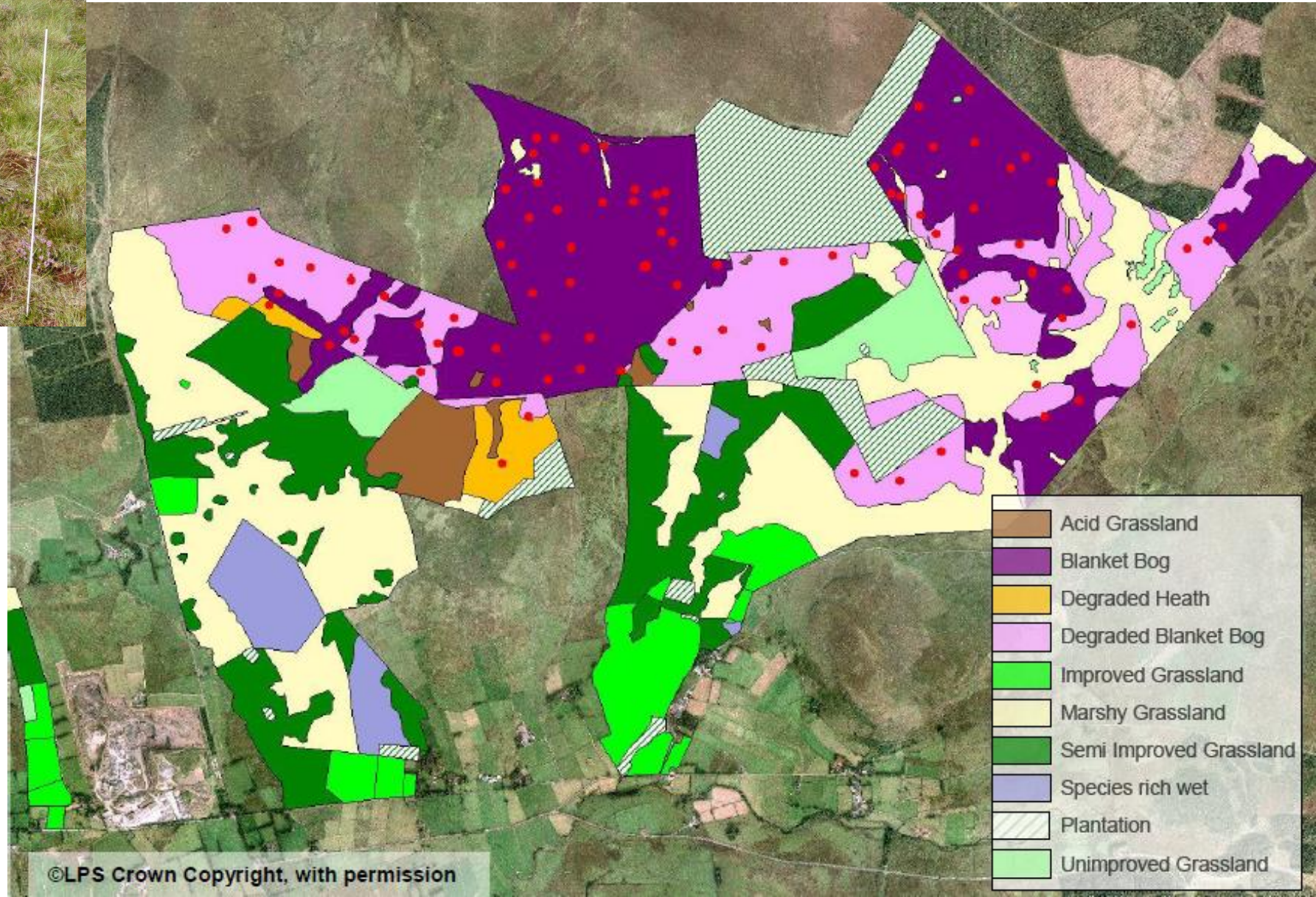
Sheep yard

Glenhead

Cattle yard

- 960 ha's
- Peat/Mineral split
- 300-1000ft
- In Bye v Park & Hill
- Killylane Reservoir

# Vegetation Classification & Monitoring - Habitat Mosaics



- Acid Grassland
- Blanket Bog
- Degraded Heath
- Degraded Blanket Bog
- Improved Grassland
- Marshy Grassland
- Semi Improved Grassland
- Species rich wet
- Plantation
- Unimproved Grassland

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## 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	2018/1 9	2017/1 8	2016/1 7	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

**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

	2019/20	2018/1 9	2017/1 8	2016/1 7	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 tugging (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 tugging (kg)	61.18
Total weight lambs weaned (Kg)	50442
Total mature ewe weight (Kg)	67848
Efficiency (kg lamb/kg ewe mated)	0.74

## 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



Irish Grouse Conservation Trust





## Introduction to Gamekeeping course

### Introduction to Gamekeeping Course

CAFRE together with the Irish Grouse Conservation Trust (IGCT) supported by the British Association for Shooting and Conservation (BASC) are currently recruiting for an introduction to gamekeeping course.



The course covers a wide range of game-related topics including habitat management, game and rough shooting and the role of gundogs. The course is nine days in total spread over six months and starts in September.

This practical course formally titled "Principles of Live Quarry Shooting" is accredited by City & Guilds. Additional opportunities are provided to achieve BASC certificates in Safe Shot and Rifle Safe Shot.

Applicants must be 16 years of age or older.

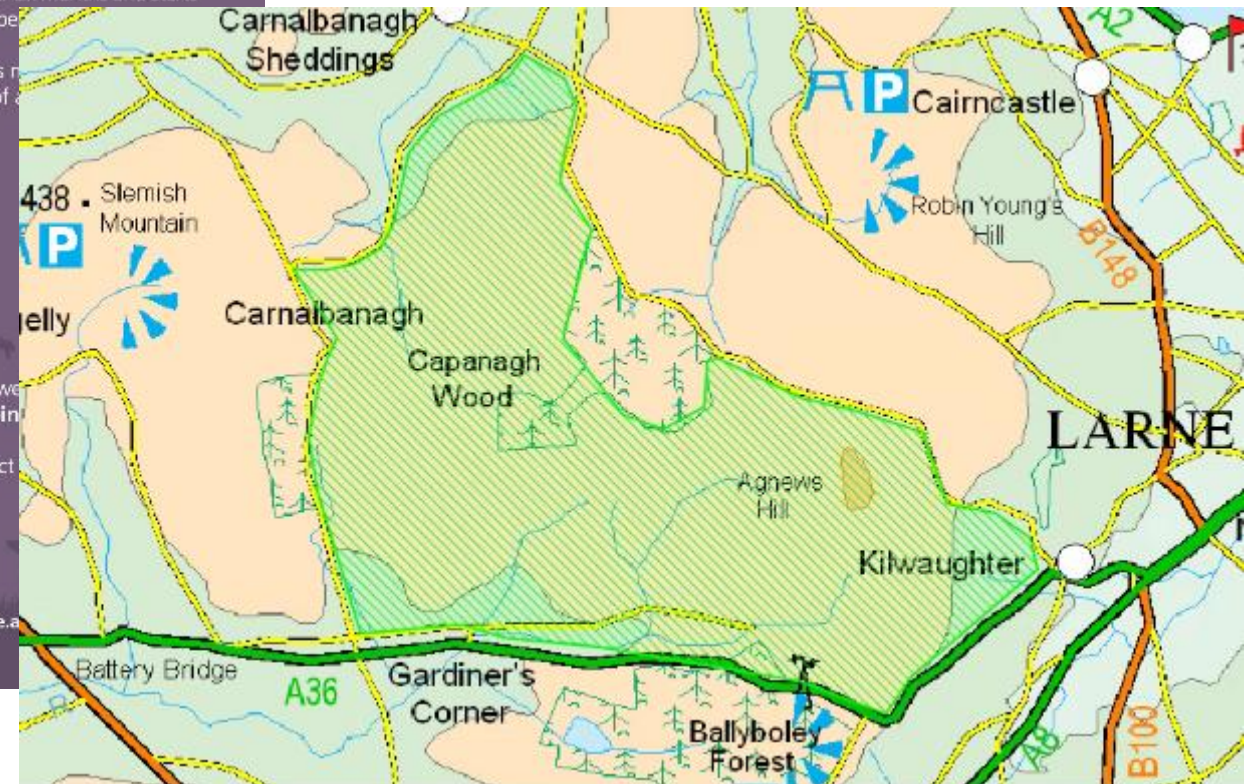
To apply for the course please visit the CAFRE website at [www.cafre.ac.uk/short-courses/gamekeeping](http://www.cafre.ac.uk/short-courses/gamekeeping)

If you require further information please contact Bryan Irvine on Tel: 028 9442 6825 or Email: [bryan.irvine@daera-ni.gov.uk](mailto:bryan.irvine@daera-ni.gov.uk)

Discover CAFRE  

[www.cafre.ac.uk](http://www.cafre.ac.uk)

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





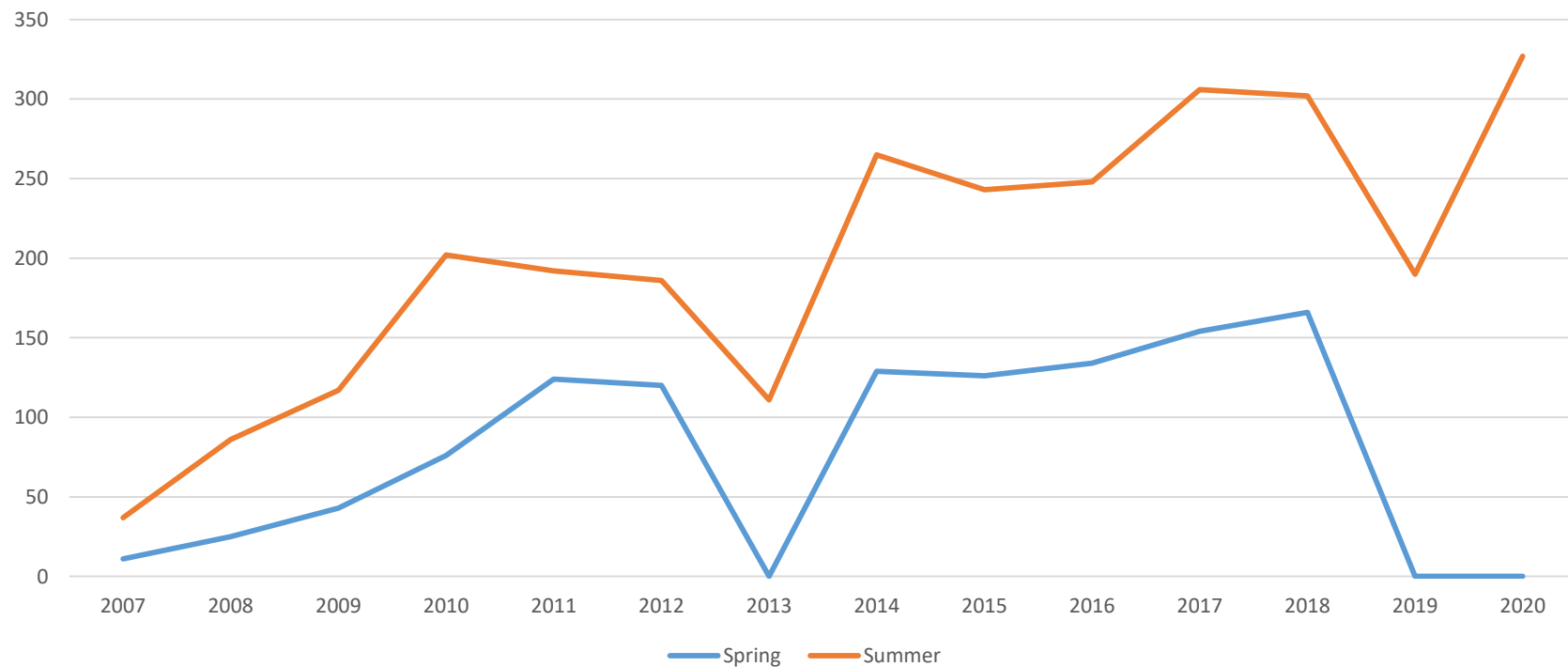


# Red Grouse

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

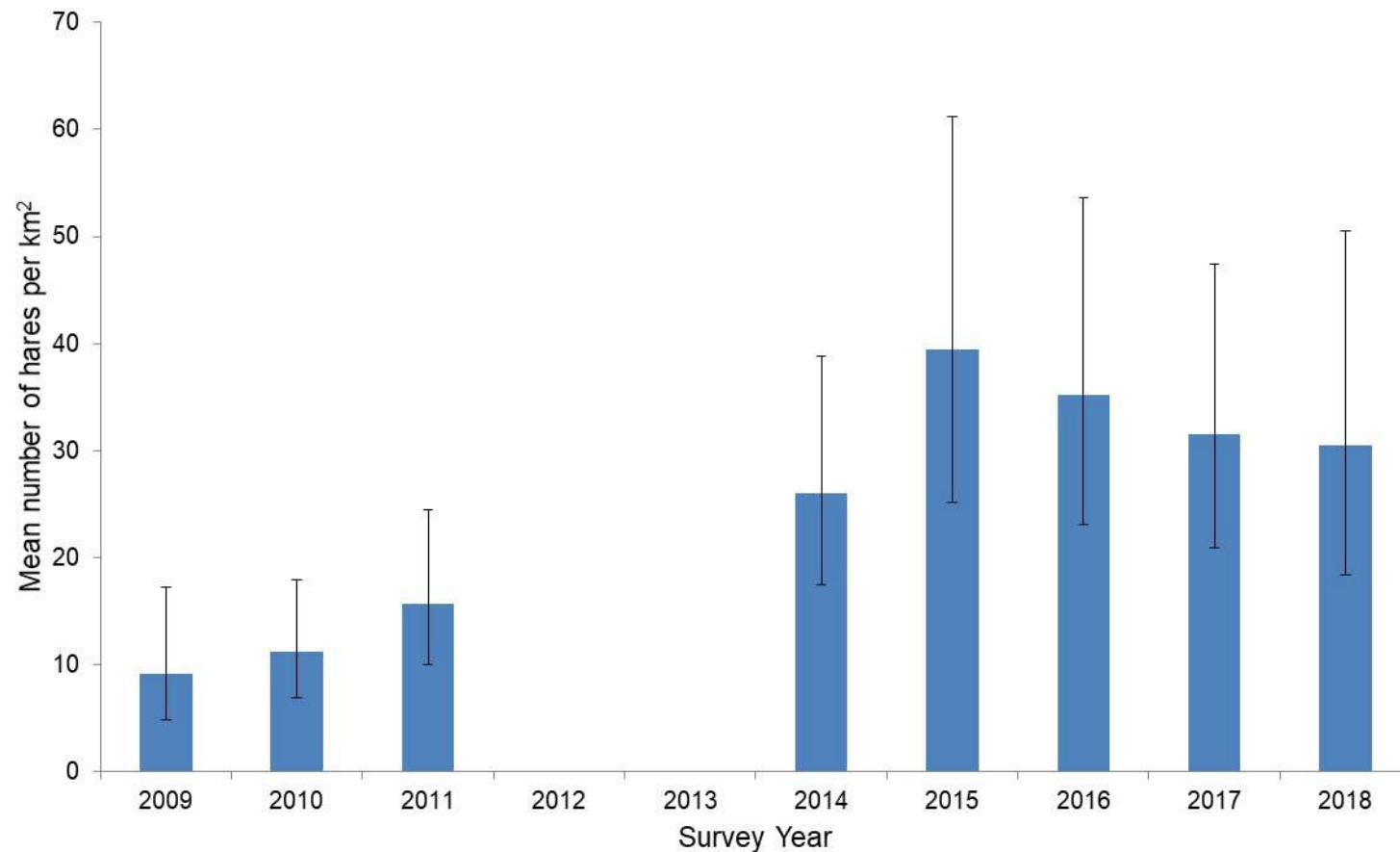


**IGCT SPRING/SUMMER GROUSE COUNT  
2007-2020**



Irish Grouse Conservation Trust

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



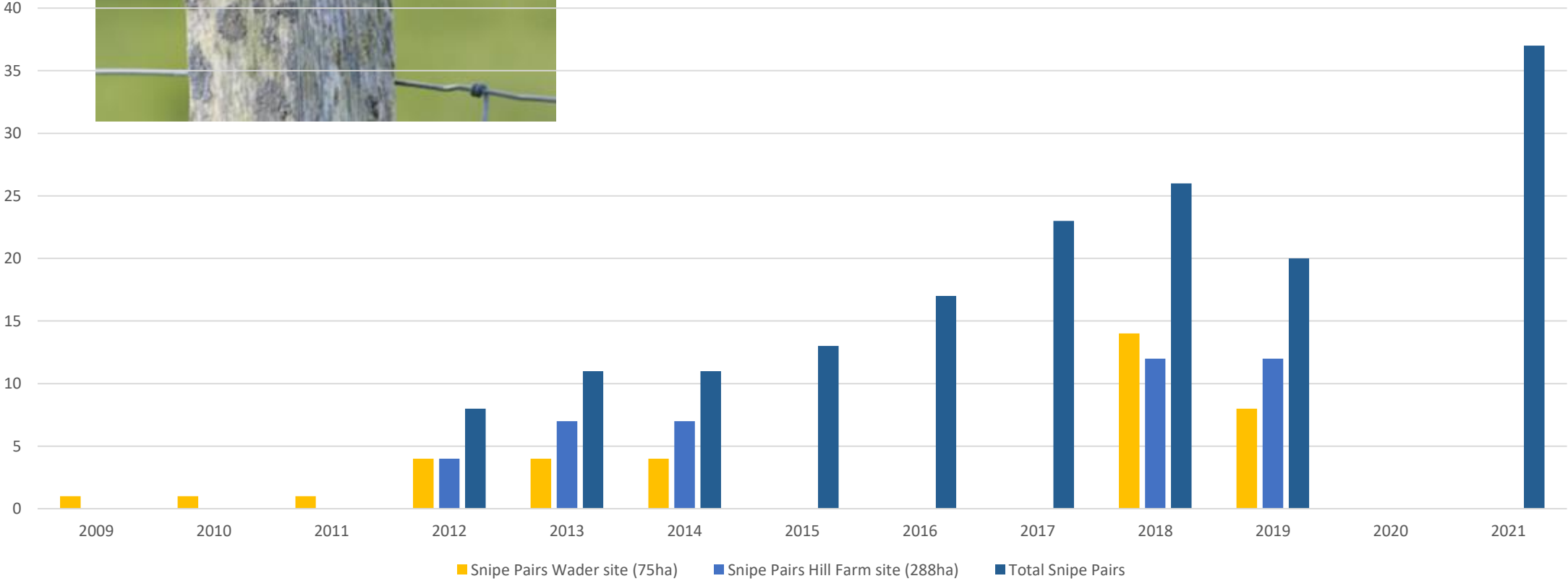
- Predators
- Habitat heterogeneity
- Irish average 2006-2007 3.3 – 7/km<sup>2</sup>



Photos. I.Montgomery



CAFRE Hill Snipe Pairs 2009-2021





CAFRE Hill Curlew & Lapwing 2009-2021

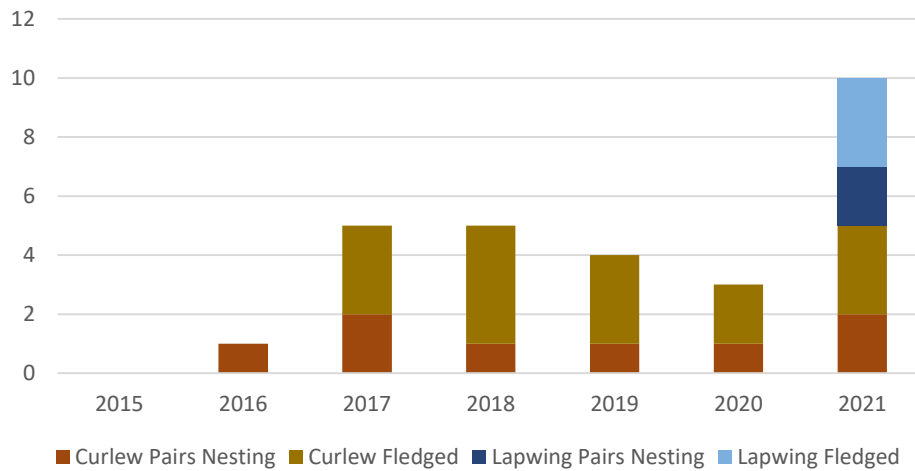


Photo courtesy of Neal Warnock

CAFRE Hill Skylark & Meadow Pipit 2011-2021

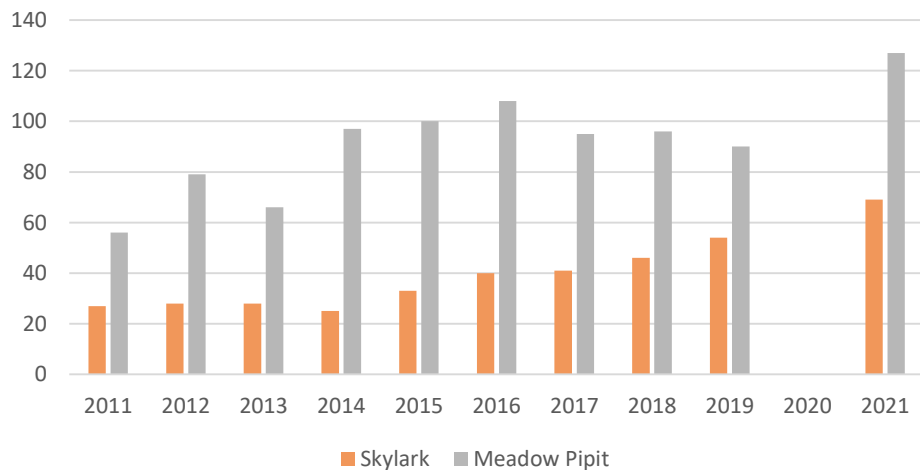


Photo courtesy of Michael Latham

# Breeding Wader Site



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

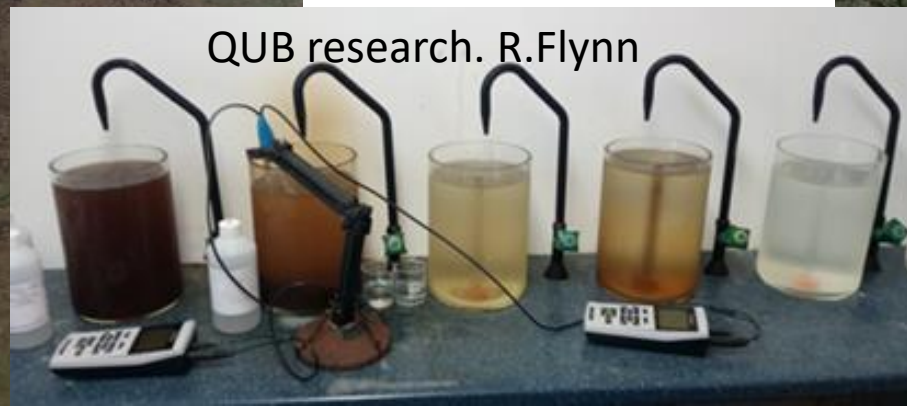


Creeve Park – Feb 2021      Provision of multiple water sources - mineral soil scrapes & moorland dams



# Water Quality (Colour – DOC)

Treatment cost/ha ~£90 pa  
(R.Flynn & students QUB)



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

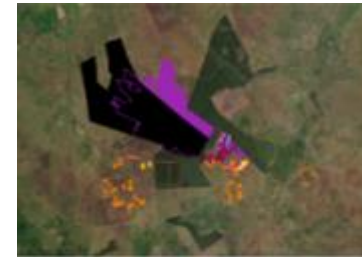
VERSUS

“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

# 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

College of Agriculture Food and Rural Enterprise & Northern Ireland Environment Agency

**Service Information Note**

Wildfire response Plan -  
Glenwherry Hill Farm

**No. LD-IN-  
Document Overview**

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	Approved By (to be completed by author)		
	Department	Reg (I)	Date
NIEA : Wildfire Officer	NIEA		
CAFRE : Farm Director	CAFRE		
NIFRS : Wildfire Officer	NIFRS		
	Other		
	Comment	Dept. Manager (Info Note)	

**Readership**

Personnel	
Operational	<input type="checkbox"/>
Non-Ops	<input type="checkbox"/>
Non-Ops with Ops Reference	<input type="checkbox"/>
Fire Control	<input type="checkbox"/>
NIEA	<input type="checkbox"/>

**Risk Assessment**

Completed (I)
<input type="checkbox"/>
Equalities Impact Assessment
Completed (I)
<input type="checkbox"/>

FOI Exemption Required?	Yes	No	Reason
	<input type="checkbox"/>	<input type="checkbox"/>	

Security Level	N/A
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Review Date	1/10/2021
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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/cm<sup>3</sup>  
 C~51-55% of peat BD

10000m<sup>2</sup> @ 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 CO<sub>2</sub> eq**

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

# Forest to Bog

1. **Minimise emissions.**      **9.91t CO<sub>2</sub>eq/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)



Ploughed 1m deep, minor drains 3m apart, main drains 50m apart & 2m deep



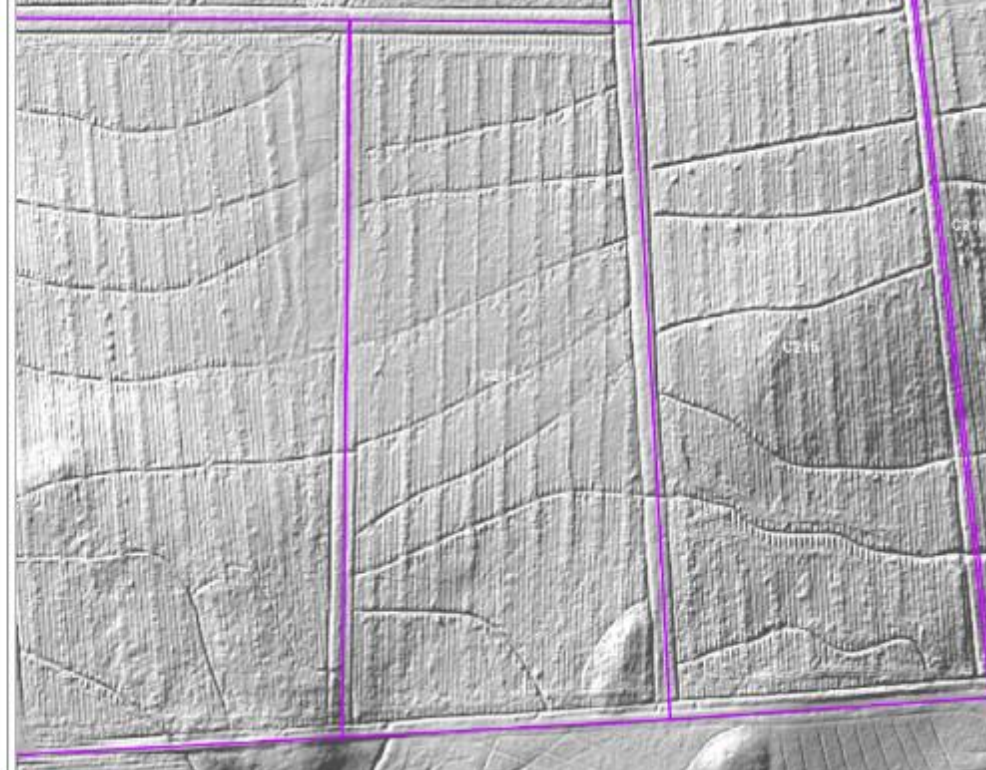
212 Sitka Oct 2021

Using stump flipping, ground smoothing, peat bunds, peat dams, turf relocation, cell bunding, drain blocking



214 - Jan 2021

# 214 - Jan 2021 Forest to Bog



214 – “Dry” July 2021. Forest to Bog

Value of utilising furrow vegetation

214 August 2021





# 212 Lodgepole - Oct 2021.



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

# Rewetting open moor

1. **Minimise C emissions.**      **10cm reduction WTD = 3 t CO<sub>2</sub> 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 CO<sub>2</sub> eq/ha  
WTD reduction 10cm = 3 T  
Summer v Winter  
Control v Demo > 10cm



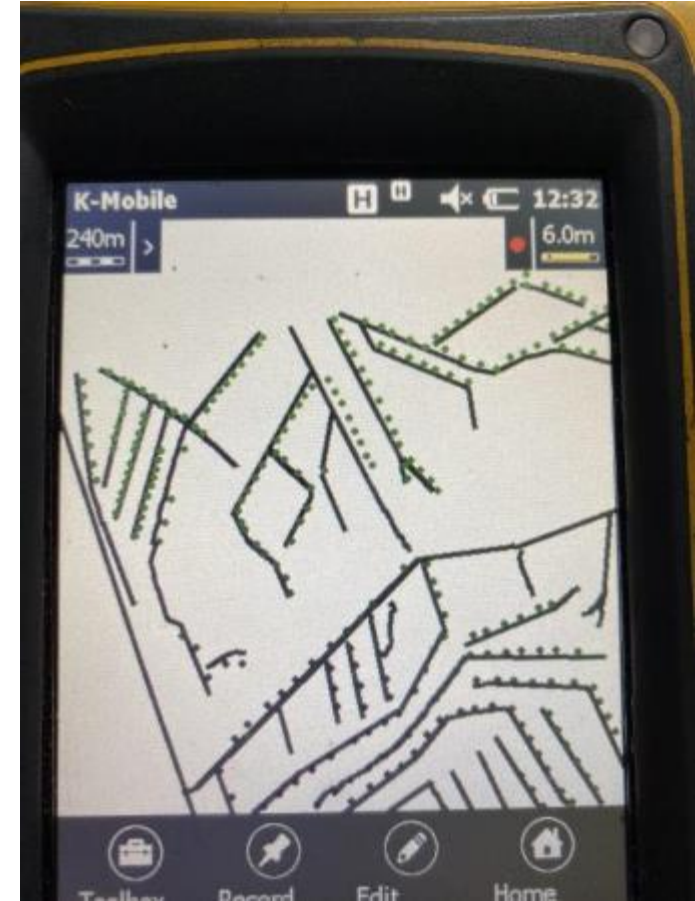
# Front Point – Dec 2021



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

