Conservation Grazing in the Uplands

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Teagasc Signpost Series

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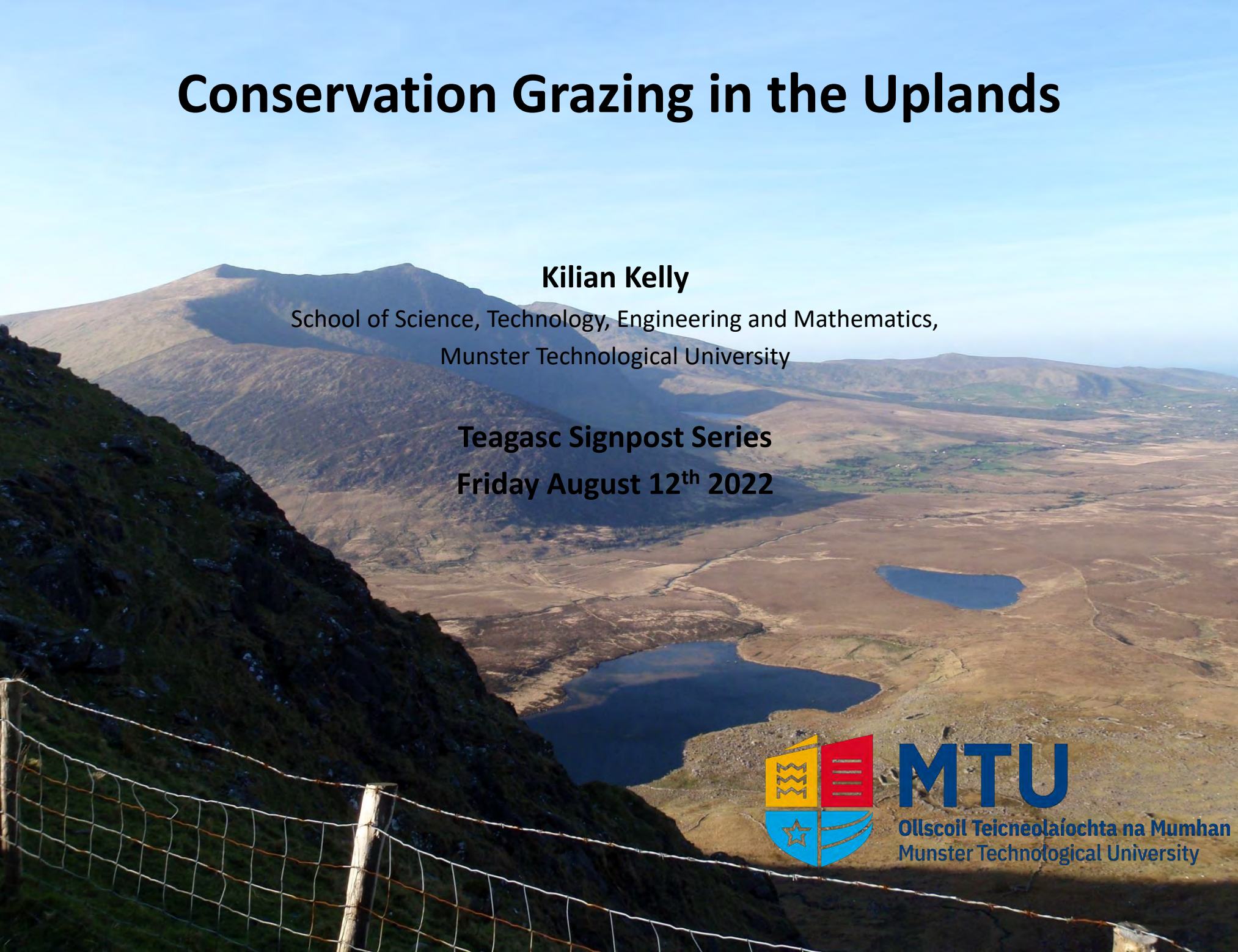

MTU

Ollscoil Teicneolaíochta na Mumhan

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What is conservation grazing?

Upland habitats & species – threats, conservation status (briefly)

Conservation Grazing research in Kerry


Conservation grazing?

Grazing and wildlife conservation

- **Use of grazing animals to maintain and enhance biodiversity**
- **A tool** for managing habitats
- Focus on **semi-natural landscapes** with **domestic animals**
- Dunes – **Uplands** – Woodlands & Traditional Orchards – Heaths – Grasslands
- Why use grazing for conservation?
  - Many of our semi-natural landscapes have developed with grazing
  - Some habitats benefit from grazing to maintain open structure
  - May be habitat or species focussed
  - In Ireland, general **succession to woodland** unless some management is in place (note: succession to woodland is often desirable and may be a management goal)



Exmoor ponies

Burren winterage

Buffalo, Pembrokeshire

Traditional Orchards in the Wyre Forest

Konik Ponies, Wicken Fen

Wide range of species and breeds depending on ‘the job’

- Site management involves selecting appropriate species & breed, managing stocking rates, extensive grazing, mob grazing
- Dependent on habitat availability and distribution of habitat patches
- **Cattle** e.g. Shorthorns, Belted Galloway, Dexter, Highland, Irish Moiled, Kerry, North Devon
- **Sheep** e.g. Hebridean, Jacob, Soay, Cotswold
- **Equines** e.g. Dartmoor, Fell Pony, Shetland, Koniks
- Goats and Pigs

How do grazers influence habitats?

1. **selective defoliation** (physical form/anatomy of plants – plant chemistry – seasonality)
2. **poaching**
3. **dunging** & **urine**

- **Effects on ecosystem processes** such as productivity, distribution of nutrients
- It can cause **cascading effects on the** structure of ecosystems
- **Influences structure and species composition** of habitats, with consequences for plant animal communities (e.g. invertebrates & birds)

Physical attributes & impact on biodiversity

- **Physiological differences**

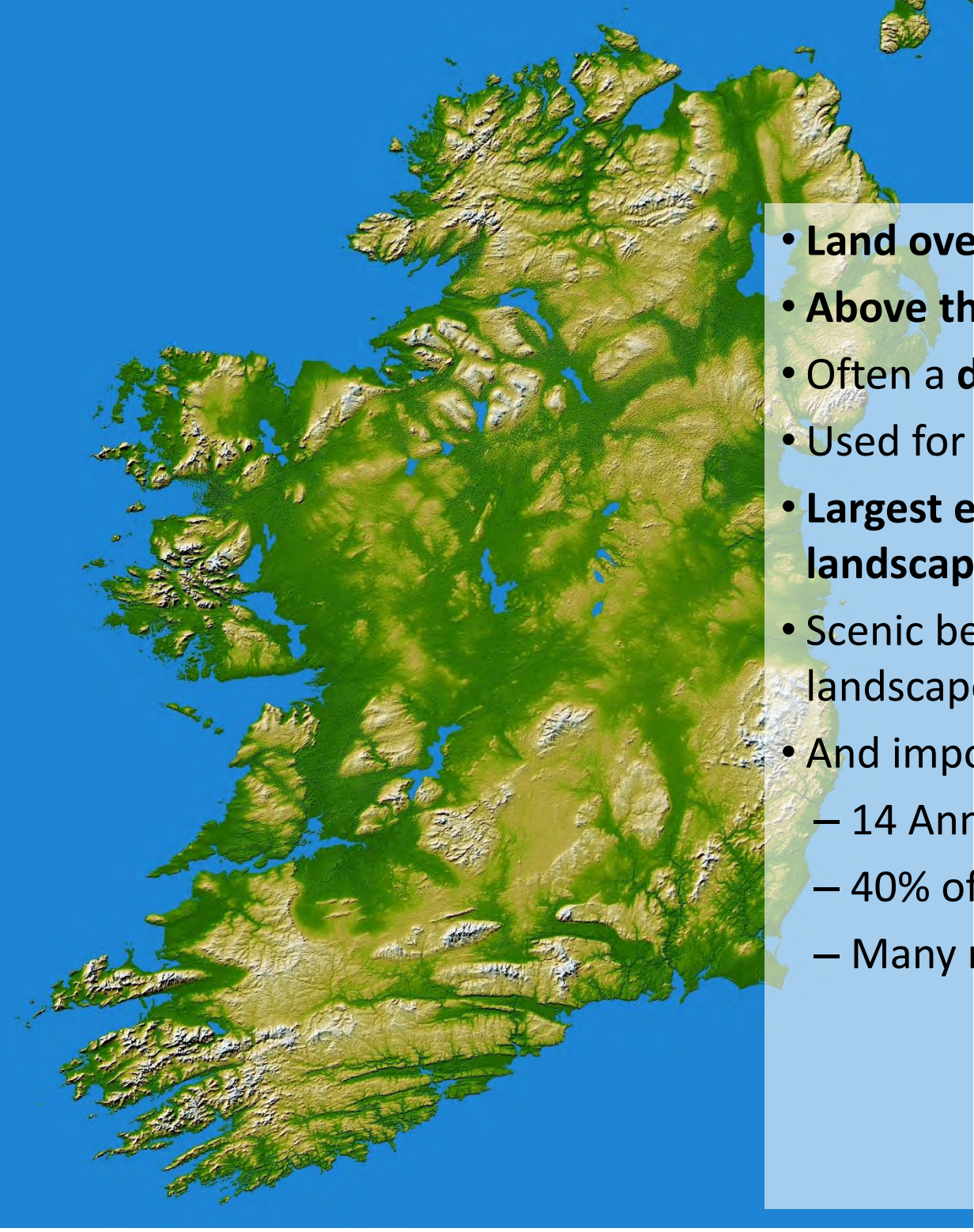
-> differences in grazing behaviour

-> differences in ability to be selective

- Differences in ability to be selective has impacts on sward characteristics and biodiversity

- **Sheep** are dominant herbivores in the Irish uplands
- Small mouths and highly curved incisors - selective feeders
- Graze close to ground and bite off desirable portions of the plants
- Greater ability than cattle to select high quality plant parts such as flowers, pods and young shoots

- **Cattle** use their tongues and dental pad when grazing
- Pull tufts of vegetation, leaving tussocks.
- This pulling and tearing = low ability to be selective
- Can be beneficial in the control of dominant upland grasses species such *Molinia caerulea*

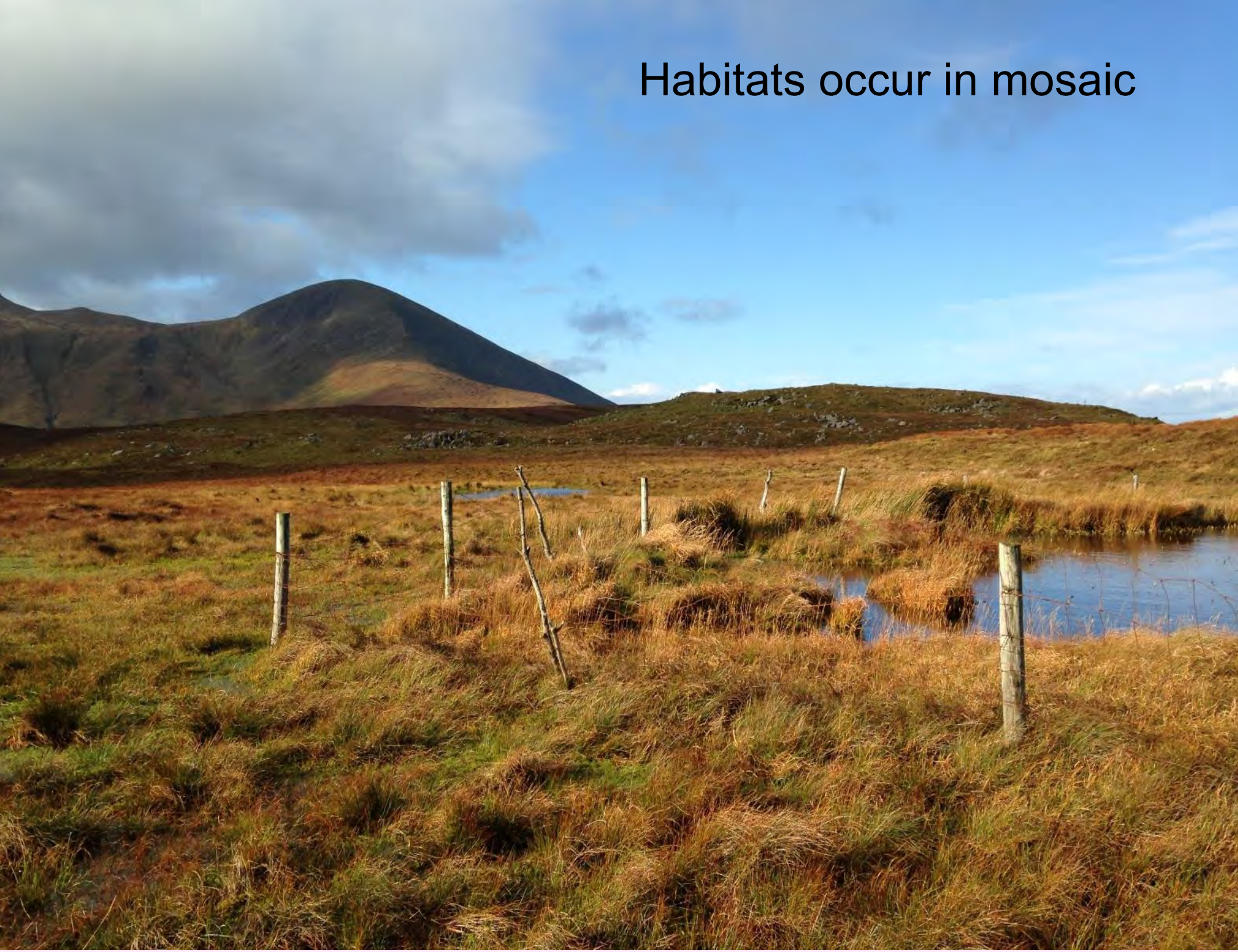


The Uplands

- **Land over 150 m** (almost 1/3rd of Ireland)
- **Above the limits of enclosed farmland**
- Often a **distinct vegetation boundary**
- Used for **rough grazing**
- **Largest expanses of semi-natural landscapes**
- Scenic beauty, recreation, working landscapes
- And important for conservation
  - 14 Annex habitats (Habitats Directive)
  - 40% of our SAC network
  - Many rare and threatened species

Annex I habitats occurring in the Irish uplands. From National Survey of Upland Habitats (Perrin et al., 2014)

1. **Northern Atlantic wet heaths with *Erica tetralix***
2. **European dry heaths**
3. Alpine and boreal heaths
4. Species rich Nardus grassland
5. ***Blanket bog**
6. Transition mires and quaking bogs
7. Depressions on peat substrates of the *Rhyncosporion*
8. Alkaline fens
9. Siliceous scree of the montane to snow levels
10. Calcareous and calcshist screes of the montane to alpine levels
11. Calcareous rocky slopes with chasmophytic vegetation


Habitats occur in mosaic

Habitats Directive Article 17 Reports
The Status of Protected Habitats in Ireland 2013 & 2019

Blanket Bog (7130)

2.8 Conclusions (assessment of conservation status at end of reporting period)	
2.8.1 Range	assessment Favourable (FV) qualifiers N/A
2.8.2 Area	assessment Bad (U2) qualifiers declining (-)
2.8.3 Specific structures and functions (incl Species)	assessment Bad (U2) qualifiers declining (-)
2.8.4 Future prospects	assessment Bad (U2) qualifiers declining (-)
2.8.5 Overall assessment of Conservation Status	Bad (U2)
2.8.6 Overall trend in Conservation Status	declining (-)

Wet Heath (4010)

2.7.5 Other relevant information	Area of habitat within SAC network = 771.51 km2 Area of habitat outside SAC network = 658.15 km2 Area of habitat within SAC network that is QI = 608.25 km2 Area of habitat within SAC network that is not QI = 163.26 km2
2.8 Conclusions (assessment of conservation status at end of reporting period)	
2.8.1 Range	assessment Favourable (FV) qualifiers N/A
2.8.2 Area	assessment Inadequate (U1) qualifiers declining (-)
2.8.3 Specific structures and functions (incl Species)	assessment Bad (U2) qualifiers improving (+)
2.8.4 Future prospects	assessment Bad (U2) qualifiers stable (=)
2.8.5 Overall assessment of Conservation Status	Bad (U2)
2.8.6 Overall trend in Conservation Status	stable (=)

Dry Heath (4030)

2.8 Conclusions (assessment of conservation status at end of reporting period)	
2.8.1 Range	assessment Favourable (FV) qualifiers N/A
2.8.2 Area	assessment Inadequate (U1) qualifiers declining (-)
2.8.3 Specific structures and functions (incl Species)	assessment Bad (U2) qualifiers improving (+)
2.8.4 Future prospects	assessment Bad (U2) qualifiers stable (=)
2.8.5 Overall assessment of Conservation Status	Bad (U2)
2.8.6 Overall trend in Conservation Status	stable (=)

NPWS (2013, 2019). *The Status of EU Protected Habitats and Species in Ireland*. Habitats Assessments Volume 2.

Conservation Grazing in Kerry

Identify home range and habitat use of cattle

Assess their impact on upland habitats

Provide management recommendations

The Dingle Dexter Beef Company

Institute of Technology Tralee

Institutes of Technology Ireland

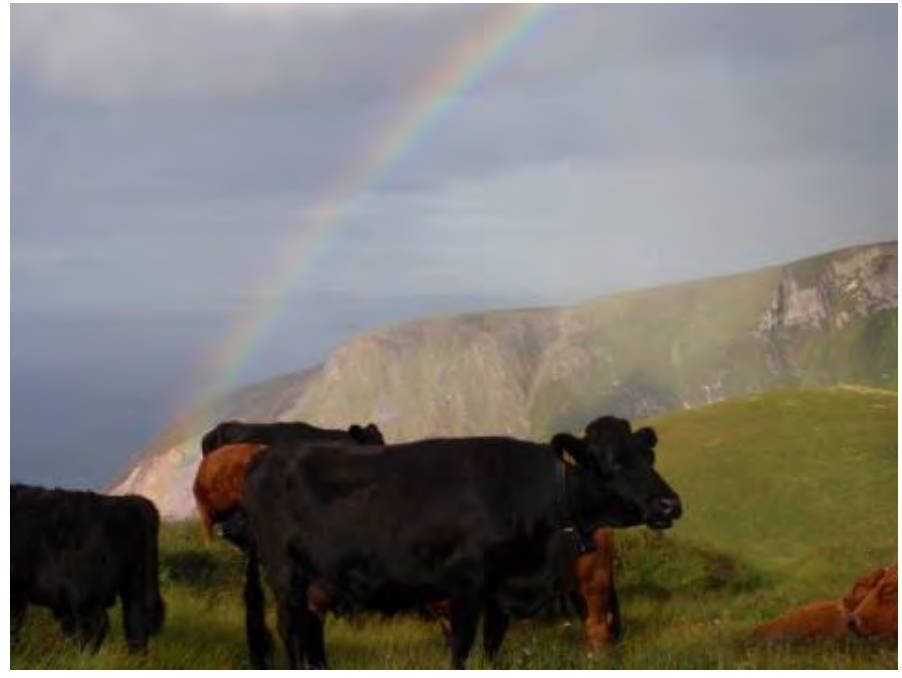
National Parks & Wildlife Service

Outline

Grazed the site with Dexters from July – September

Identified home range and habitat selection of cattle – **GPS tracking**

Assess their impact on upland habitats



- The Site

THE DINGLE PENINSULA

This mountainous promontory of North Kerry, built up of Devonian slates and sandstones, forms the most westerly outpost of the continent of Europe. It is a very mild, very wet, very exposed area, with the grand cliff-seamed mountain of Brandon (3,127 feet) set across the centre, and a wilderness of other hills.

- Mt Brandon Nature Reserve: 462 hectare state-owned reserve
- Unenclosed upland landscape – peat soils on sandstone
- **Blanket Bog** – **Wet and Dry Heath** – **Grasslands** – Scree Slopes - Sea Cliffs – Eroding Rivers
- Wet – Windy - Exposed – Atlantic

Snowdon. There is a galaxy of mossy saxifrages here, very difficult to disentangle, and many other rare plants; Ravens and Peregrines haunt the cliffs, while Choughs prefer the coastal grounds.

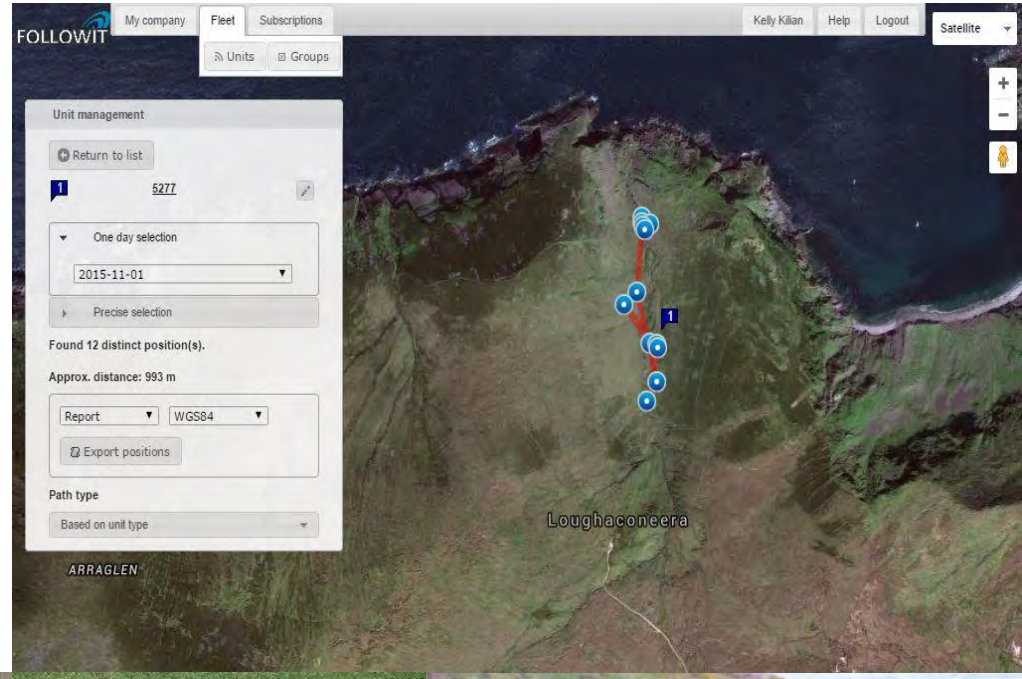
Praeger, R.L. (1950). *Natural history of Ireland. A sketch of its flora and fauna.* Collins, London. p116.

GPS tracking

30 animals July – late Sept

Selected animals fitted with tracking units (www.followit.se)

GPS fix every 2 hours



Analysis: GPS study

1. Estimate Home Range using GPS data

2. Habitat Selection using home range estimates and habitat data

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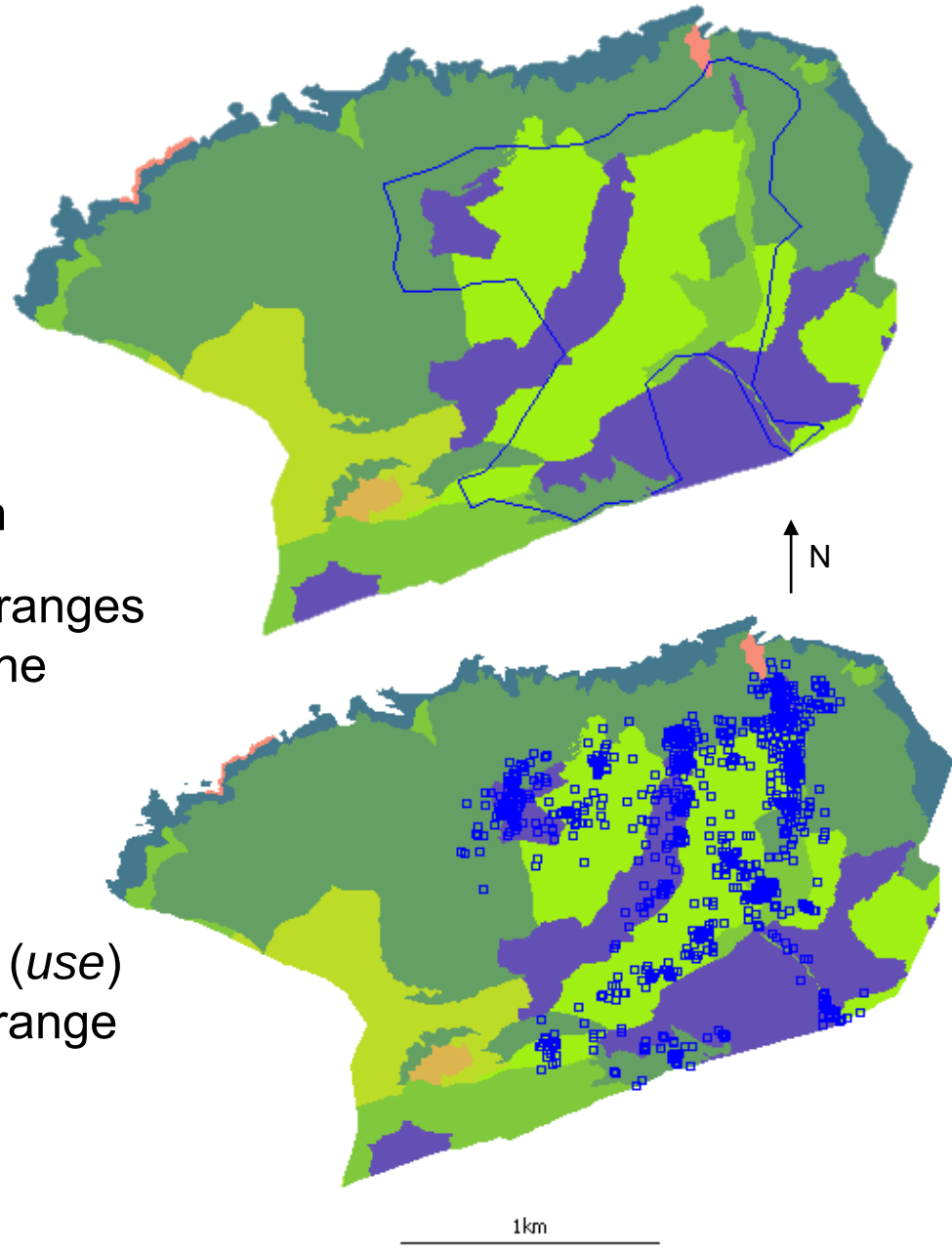
Habitat Selection using a two-step approach

I. Compare habitat composition of home ranges (i.e. *use*) against overall *availability* in the study area

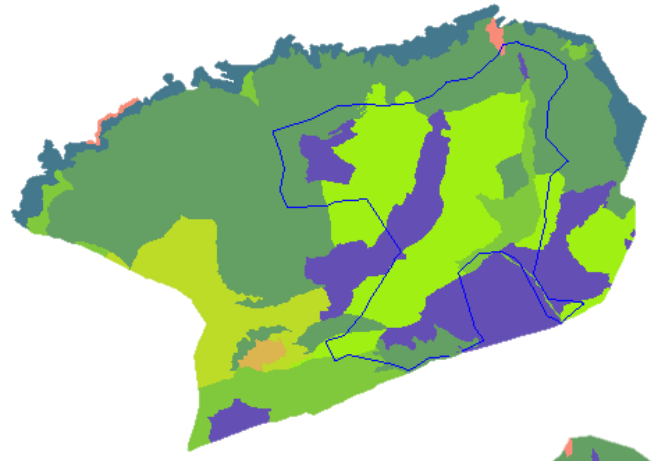
II. Compare habitat at individual locations (*use*) against the various estimates of home range (*availability*)

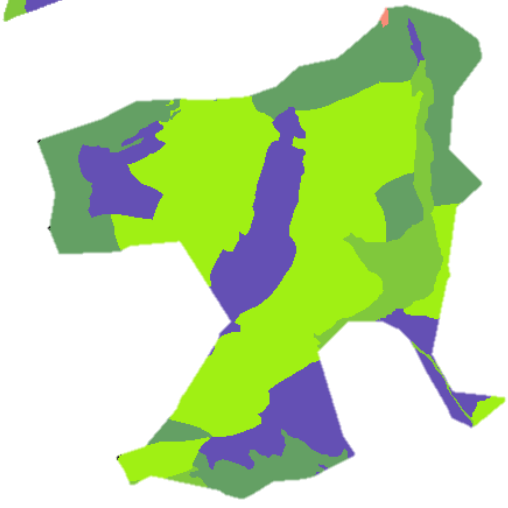


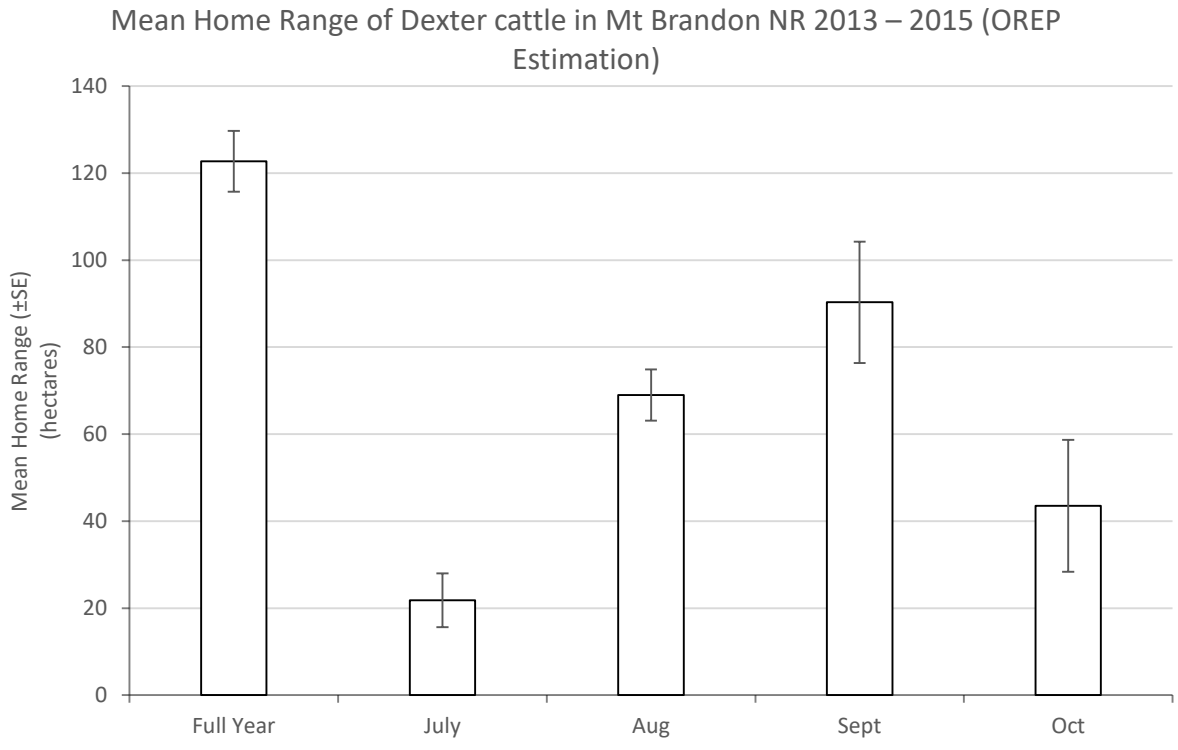
Results

<u>Summary stats</u>:

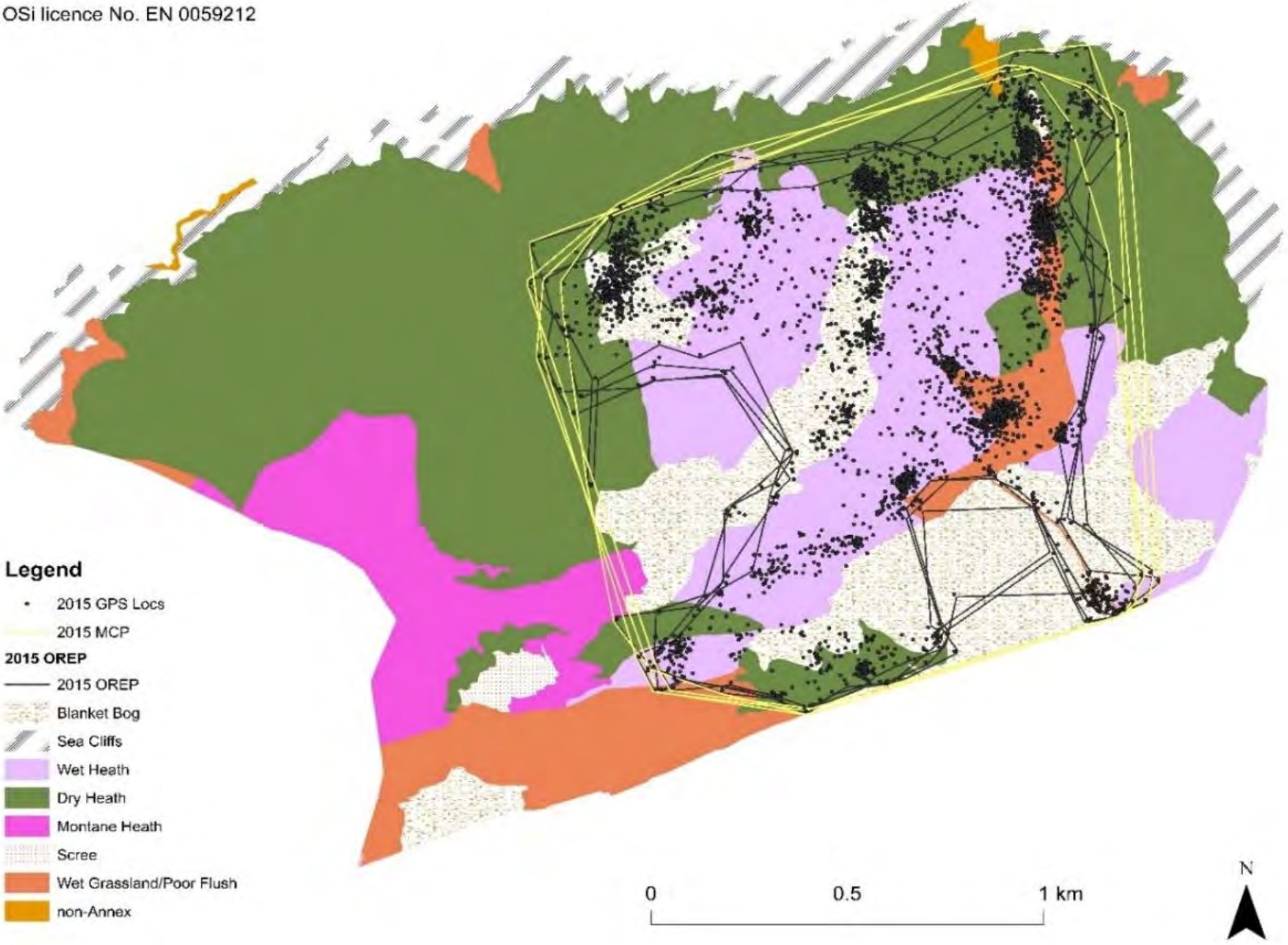
- Mean distances travelled
  - Over season = 144.23 km (±20.18)
  - Per day = 1.37 km (± 0.29)
  - Per week = 9.71 km (± 2.11)





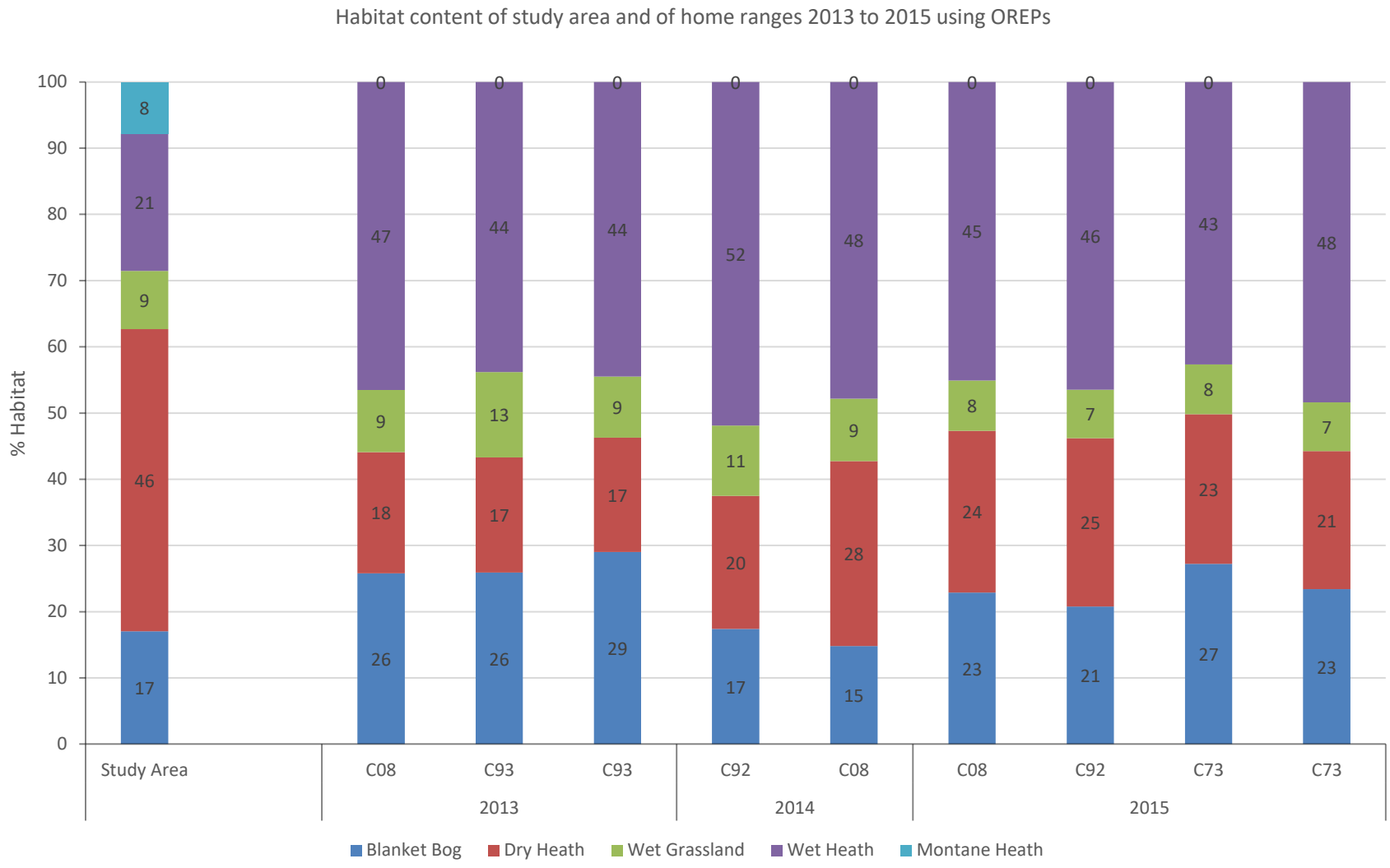


Home Range


OSi licence No. EN 0059212
Legend
2015 GPS Locs
2015 MCP
2015 OREP
2015 OREP
Blanket Bog
Sea Cliffs
Wet Heath
Dry Heath
Montane Heath
Scree
Wet Grassland/Poor Flush
non-Annex
0
0.5
1 km
N

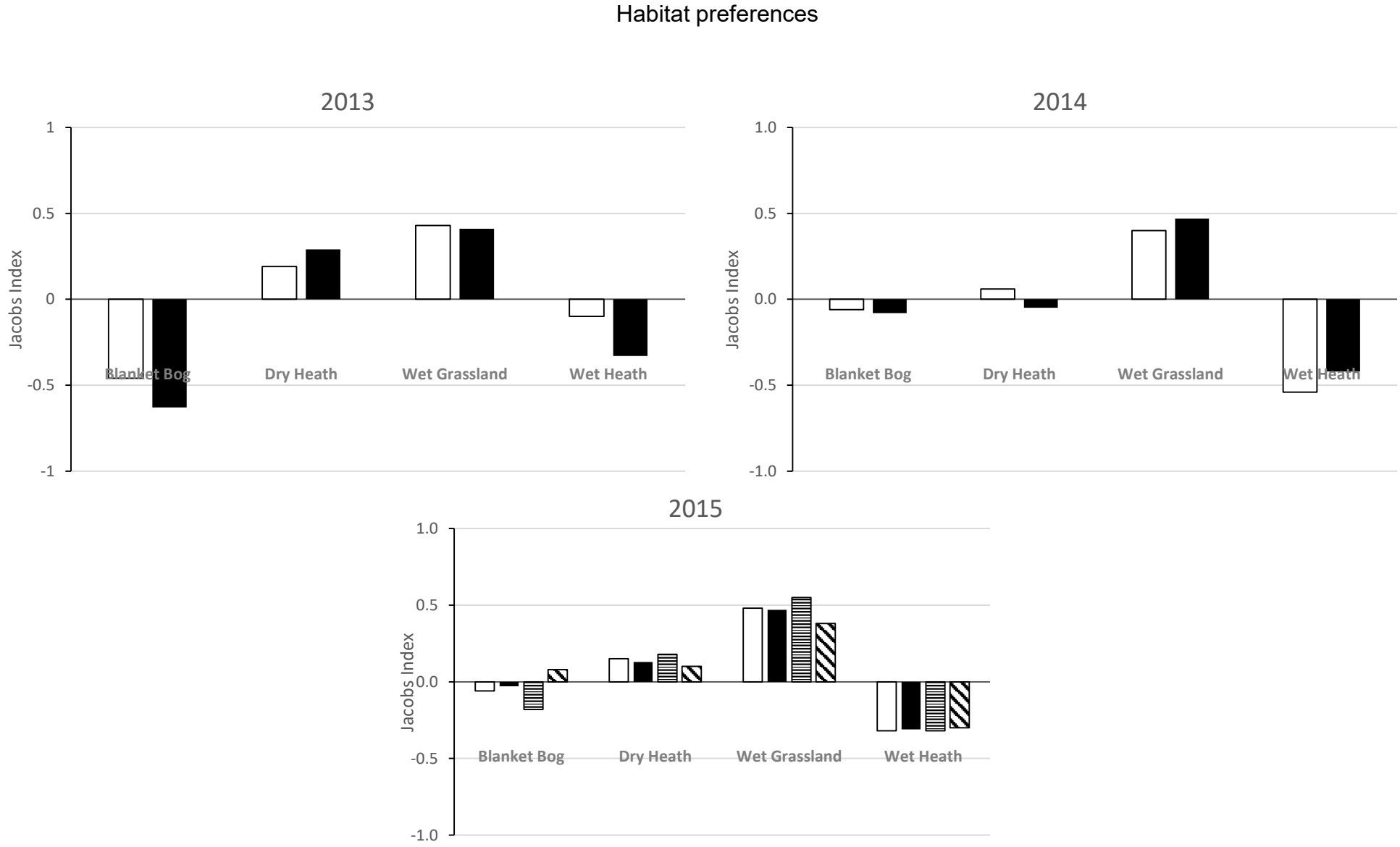

OSi licence No. EN 0059212
Legend
2015 GPS Locs
2015 MCP
2015 OREP
2015 OREP
0
0.5
1 km
N

Results – Habitat Selection



i.e. Broad Selection Level, or Johnsons (1980) "*Second Order Selection*"

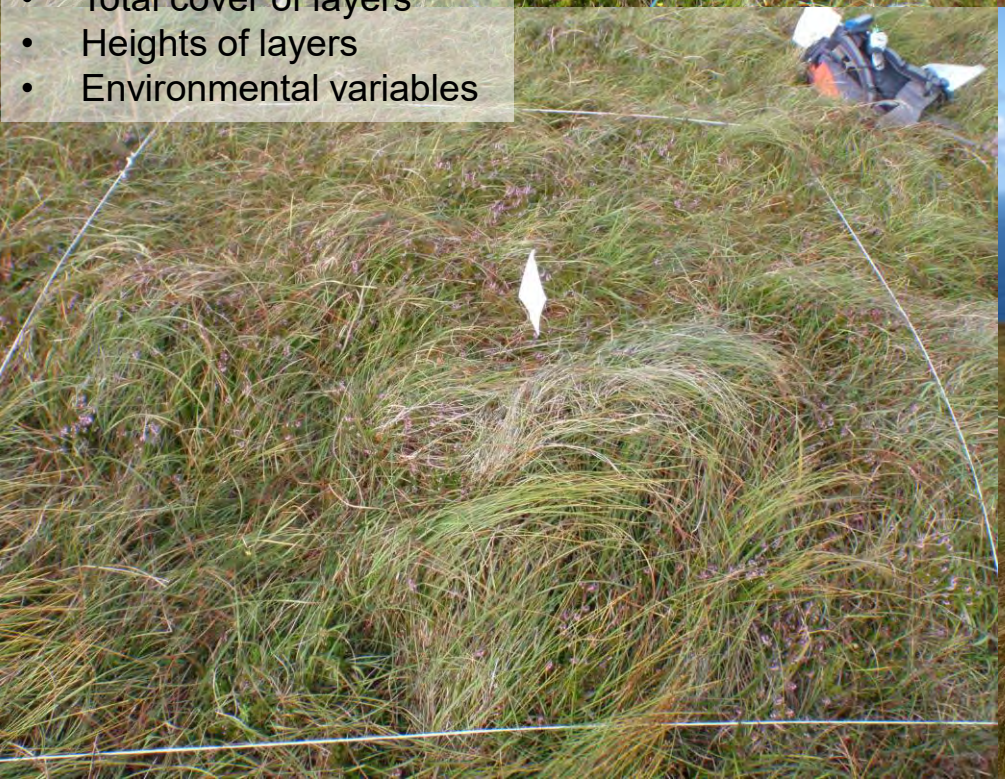
Results – Habitat Selection Using Jacobs Index



*Jacobs Index: D = (r-p)/[(r+p)–2rp], where r is the proportion of habitat used and p the proportion of habitat available.
-1 indicates complete avoidance and +1 indicates exclusive use (A = Avoid, P = Prefer).
(Jacobs, J. 1974. Quantitative measurement of food selection – a modification of forage ratio and Ivlev's electivity index. *Oecologia (Berl.) 14: 413-417).*

Vegetation Sampling Methods

- 2 x 2 m quadrats
- % cover of each species
- Total cover of layers
- Heights of layers
- Environmental variables



Conservation Status Assessments

1. Range
2. Area
3. **Structure and Functions**
4. Future Prospects

Conservation Status	Favourable (F)	Unfavourable Inadequate (U-I)	Unfavourable Bad (U-B)
Criteria	No stop failures	1 – 25% of stops failed	> 25% of stops failed

Table 2 Applicable monitoring criteria for Northern Atlantic Wet Heath with *Erica tetralix*.

	Criterion	Scale of assessment
1	*Erica tetralix* present	20 m radius
2	Cover of positive indicator species* ≥ 50%	4 m^2
3	Total cover of: *Cladonia* sp. *Sphagnum* sp., *Racomitrium languinosum* and pleurocarp mosses ≥ 10%	4 m^2
4	Cover of ericoid species ≥ 15%	4 m^2
5	Cover of dwarf shrub species < 75%	4 m^2
6	Cover of neg. indicators: *A. capillaris*, *H. lanatus*, *R. repens*, collectively < 1%	4 m^2
7	Cover of non-native species < 1%	4 m^2
8	Cover of non-native species < 1%	Vicinity
9	Cover of *Pteridium aquilinium* < 10%	Local vicinity

**B. chrysocoma*, *C. vulgaris*, *Carex* sp., *D. albicans*, *Drosera* sp., *E. tetralix*, *E. angustifolium*, *N. ossifragum*, non-crustose lichens, *P. sylvatica*, *P. purpurea*, *P. serpyllifolia*, *P. erecta*, *Sphagnum* spp., *S. pratensis*, *T. germanicum*.

Conservation Status Assessments

Plot	Plot code and comment	Grazing Level (KDE)	2013	2014	2015	Comment (reasons for failed stops)
1	u1/whex. Exclosure.	0 (none)	U-I: 13% (2/15 fails)	F	U-I: 13% (2/15 fails)	• Cover of positive indicator sp. • Bryophyte cover • Ericoid cover
2	u2/whvex. Ungrazed	0 (none)	Not sampled	U-I: 13% (2/15 fails)	Favourable	• Cover of negative indicators (*A. capillaris* = 5%)
3	g1/wh15. Grazed plot	5% (low)	U-I: 20% (2/10 fails)	F	F	• Bryophyte cover • Cover *A. capillaris* (neg' ind') • Ericoid cover
4	g2/wh60	44% (med)	U-I: 20% (2/14 fails)	F	F	• Cover of bare ground = 20% in two 2013 plots
5	u3/dhvex. Reclassified from DHex.	0 (none)	F	F	F	
11	g5/bb51. Reclassified as WH quadrats from a BB plot	55% (medium)	U-I: 11% (1/9 fails)	F	F	• One stop fail for bare soil and ericoid cover
12	g6/bb02. Reclassified WH	16% (low)	Not sampled	U-I: 13% (2/15 fails)	F	• Bare ground • Bryophyte cover
16	g9/wg69 Transition habitat Valley floor	90% (high)	U-B: 36% (5/14 fails)	U-B: 50% (7/14 stop fails)	U-B: 43% (6/14 stop fails)	• Inadequate ericoid cover • Negative indicator species (*A. capillaris*), • Bryophyte cover • *J. effusus* cover too high
17	g10/wg63 Transition habitat from WG to WH to DH. Valley floor	90% (high)	U-I: 53% (8/15 stop fails)	U-B: 35% (3/8 stop fails).	U-I: 13% (1/8 stop fails)	• Cover of negative indicators (*A. capillaris*) • Cover of positive indicators inadequate • Cover of ericoid inadequate • Inadequate bryophyte cover

Northern Atlantic Wet Heath with *Erica tetralix:* trending towards favourable
European dry heath: being maintained in favourable conservation status
Blanket bog: being maintained in favourable conservation stutus

NOTE: the site was in good conservation status at the beginning of the study

Summary

- Wet Grassland was selected most
- Blanket Bog and wet heath were selected least
- Cattle appear to target and reduce cover of *Molinia caerulea*
- No detectable increase in dwarf shrub cover in this study
- Plant community richness and diversity unchanged in period of study
- Trends in the conservation status of Annex habitats is towards favourable at current stocking densities **at this site**
- A return to cattle grazing may have a role to play
- **Management plans for uplands should consider habitat availability and distribution of patches**


Thank you