Causes and consequences of differential attack by Heather Beetle *Lochmaea suturalis* at a landscape scale

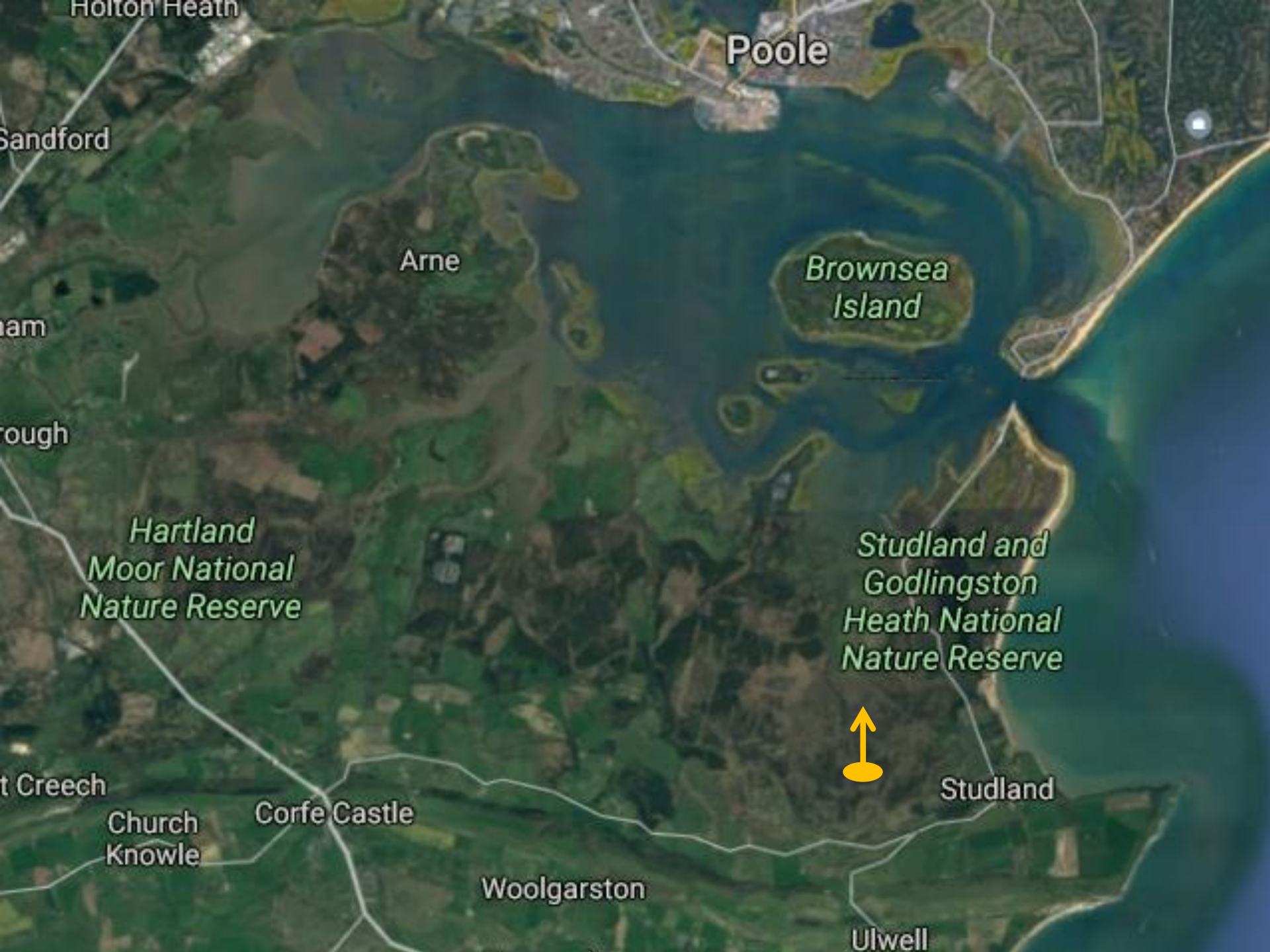
Anita Diaz, L. Franklin, M. Brown, A. Harvey, L. Bailey & K. Rickard

Bournemouth University

rspb

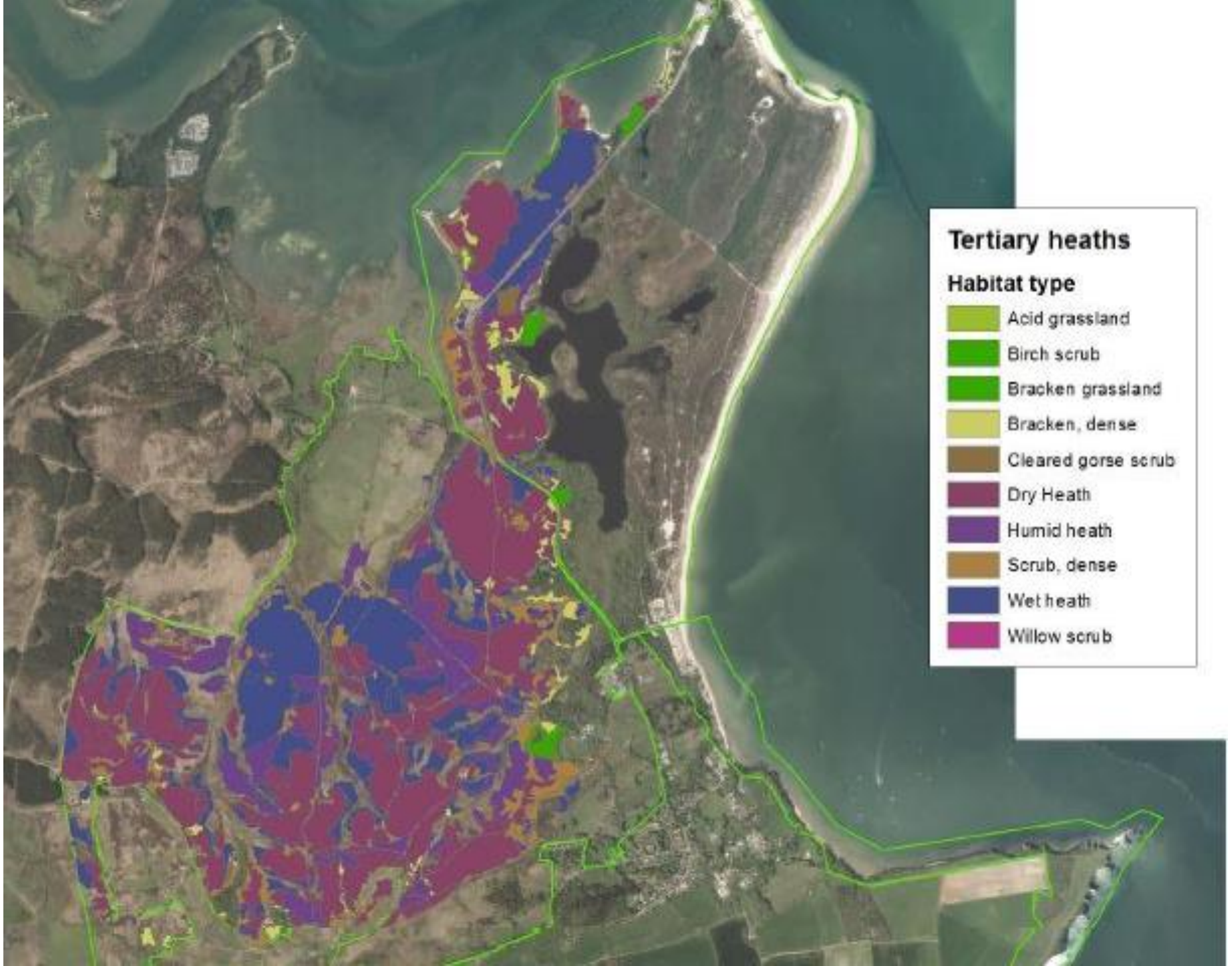
National Trust

Study site – the Poole Basin Heaths


Holton Heath
Poole
Sandford
Arne
Brownsea Island
Hartland Moor National Nature Reserve
Studland and Godlingston Heath National Nature Reserve
Studland
Corfe Castle
Church Knowle
Woolgarston
Ulwell


Holton Heath
Poole
Sandford
Arne
Brownsea Island
Hartland Moor National Nature Reserve
Studland and Godlington Heath National Nature Reserve
Studland
Corfe Castle
Church Knowle
Woolgarston
Ulwell


Holton Heath
Poole
Sandford
Arne
Brownsea Island
Hartland Moor National Nature Reserve
Studland and Godlington Heath National Nature Reserve
Studland
Corfe Castle
Church Knowle
Woolgarston
Ulwell


Tertiary heaths
Habitat type
Acid grassland
Birch scrub
Bracken grassland
Bracken, dense
Cleared gorse scrub
Dry Heath
Humid heath
Scrub, dense
Wet heath
Willow scrub

Monitoring network includes 30 wet heath and 30 dry heath sites

First set up in 2015

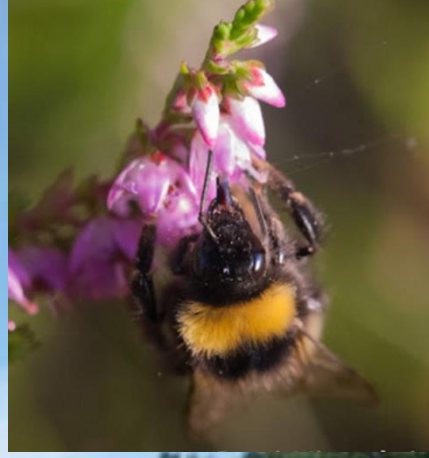
20m x 20m plots

Range of growth stages

Annual monitoring by Student Environment Research Teams (SERTs)

Heather beetle attack 2015

Lochmaea suturalis

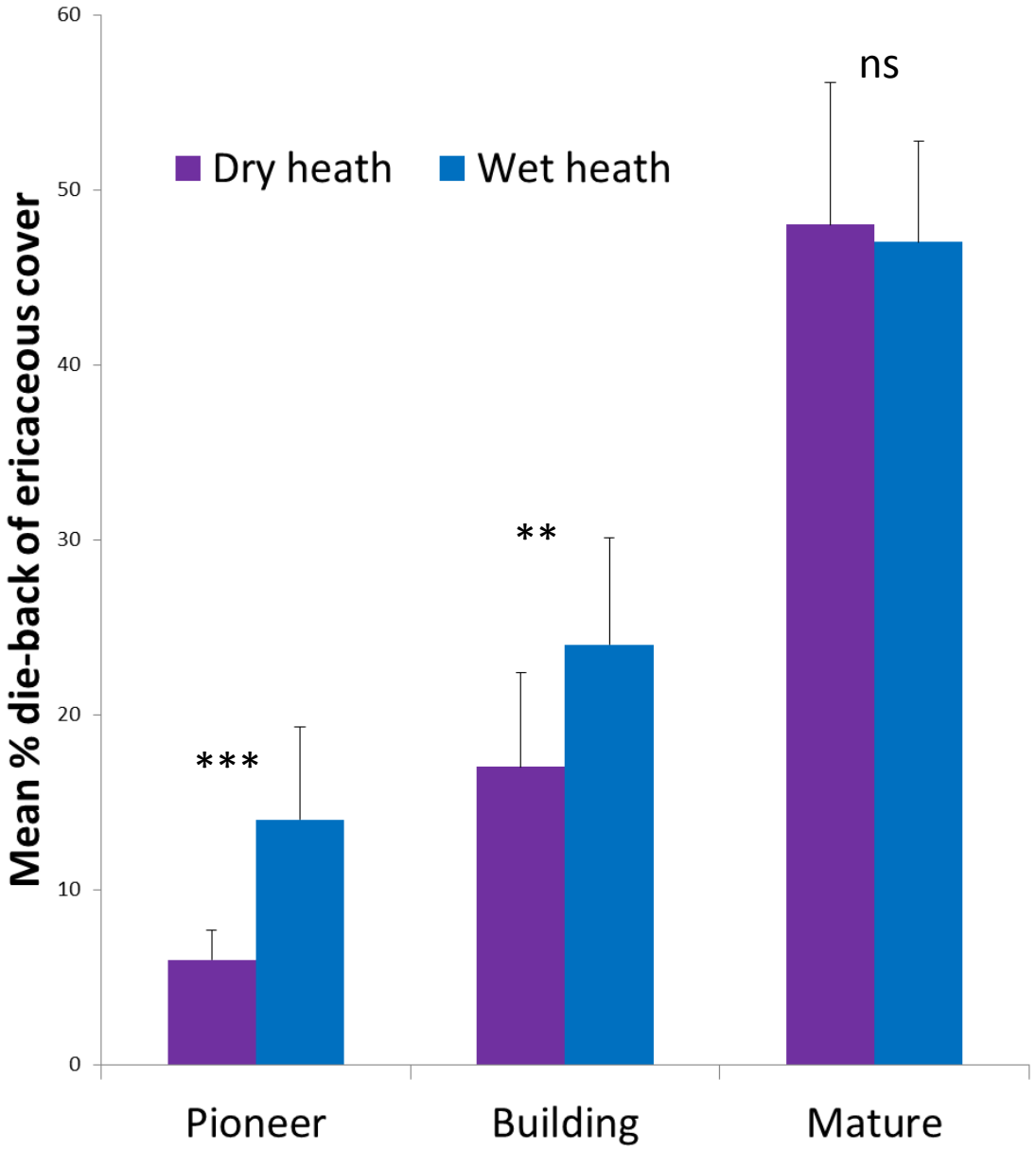


Questions

1. Do wet and dry heaths of different ages vary in the extent to which they are attacked by *Lochmaea suturalis*?
2. What is the impact of *L. suturalis* on the flowering success and vegetative regeneration of different ericaceous species?
3. What is the impact of *L. suturalis* on floral resource availability for foraging bumble bees and honey bees?

Questions

1. **Do wet and dry heaths of different ages vary in the extent to which they are attacked by *Lochmaea suturalis*?**
2. What is the impact of *L. suturalis* on the flowering success and vegetative regeneration of different ericaceous species?
3. What is the impact of *L. suturalis* on floral resource availability for foraging bumble bees and honey bees?



*** P<0.001
** P< 0.01
• P <0.55

Mature dry and wet are the most attacked
Mann Whitney U
P **

Dry heath with 50 % dieback

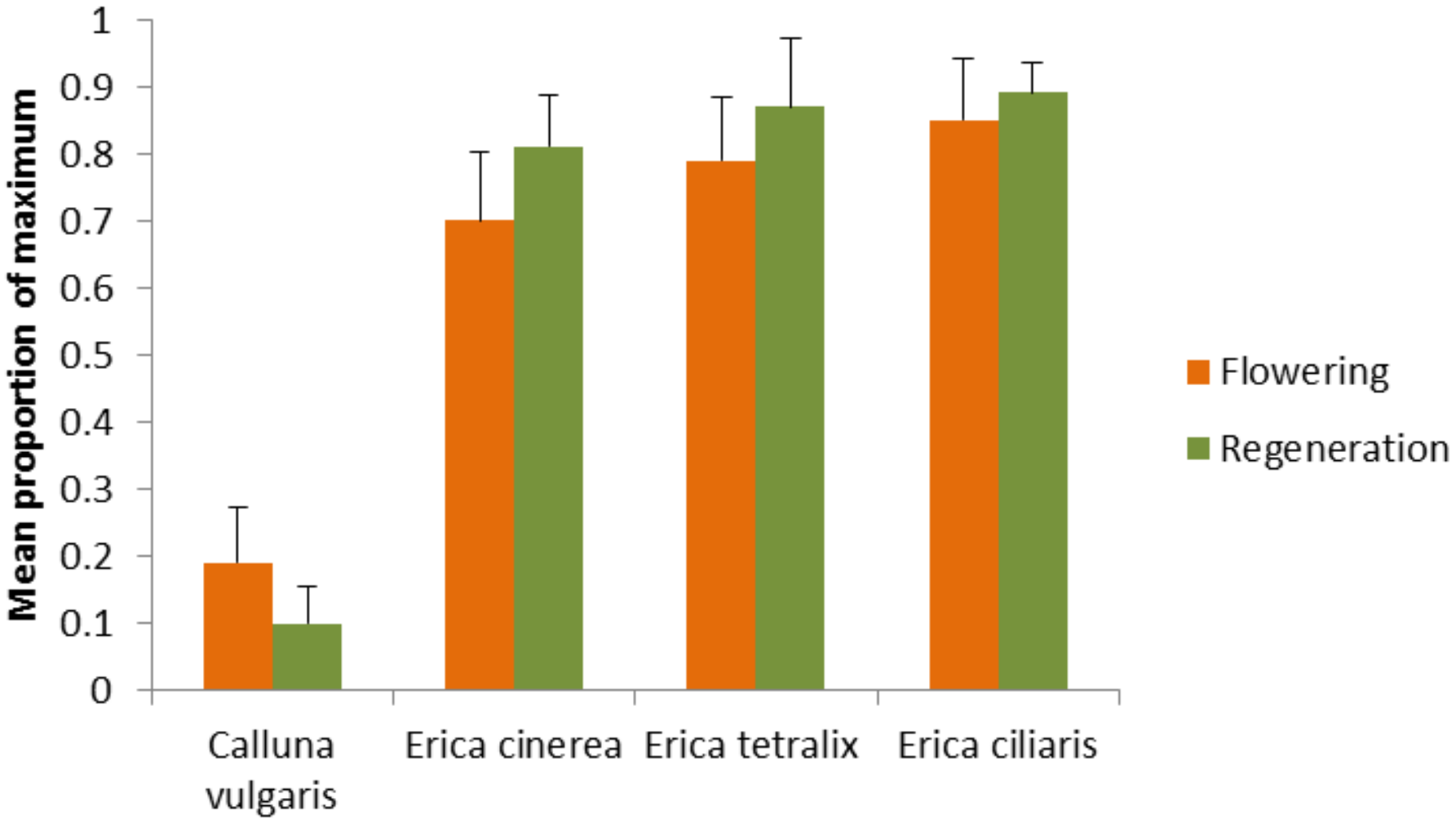

Hypnum cupressiforme


Dicranum scoparium


Campylopus introflexus

Questions

1. Do wet and dry heaths of different ages vary in the extent to which they are attacked by *Lochmaea suturalis*?
2. **What is the impact of L. suturalis on the flowering success and vegetative regeneration of different ericaceous species?**
3. What is the impact of *L. suturalis* on floral resource availability for foraging bumble bees and honey bees?



Impact on *Calluna* significantly more than on species of Erica in terms of both reduction of flowering*** and reduction of regeneration***

Early successional states are *Erica spp.* dominated

←

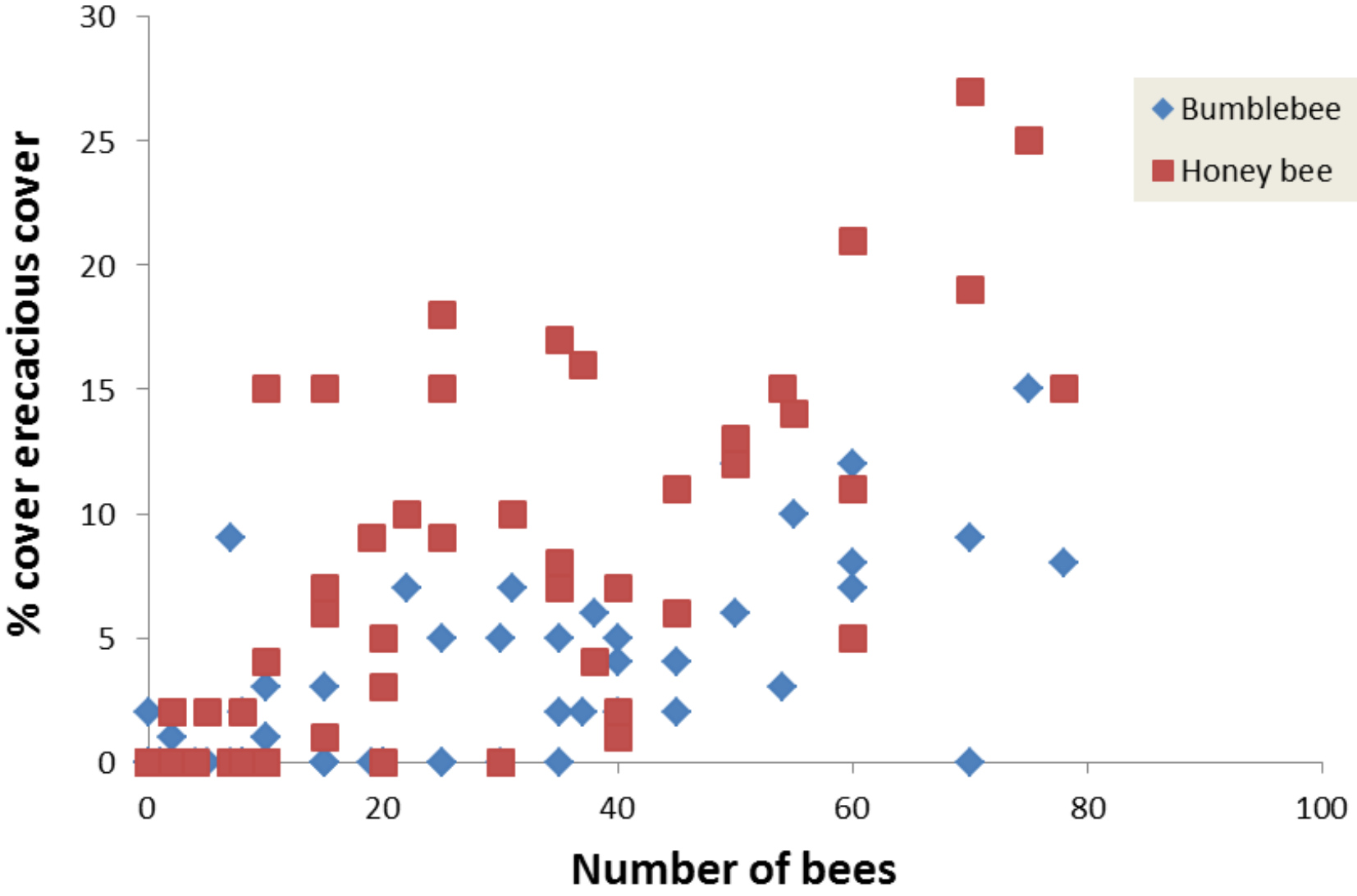
Later successional states are *Calluna vulgaris* dominated

→

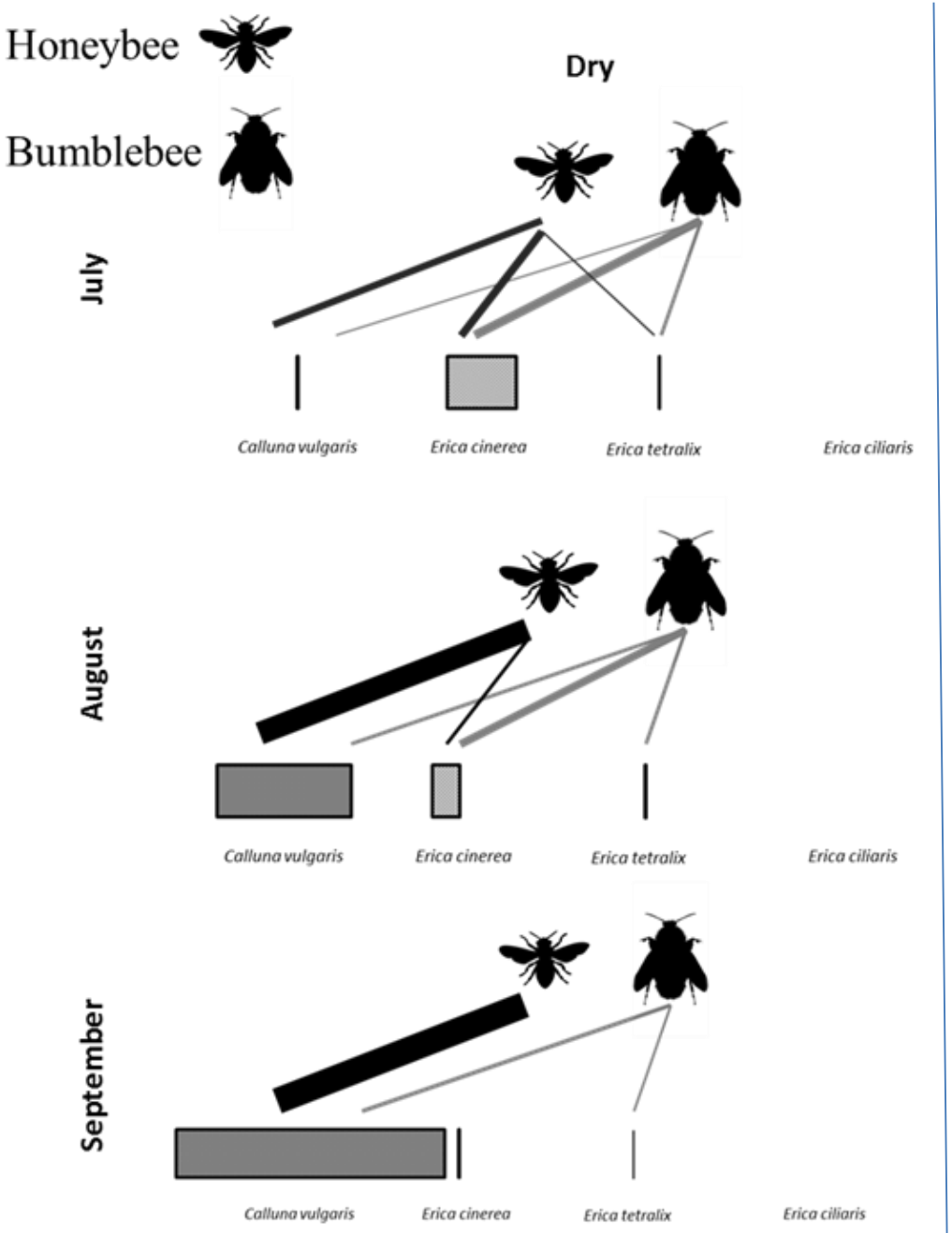
Cyril Diver Survey 1930s – abundant early successional sites

Questions

1. Do wet and dry heaths of different ages vary in the extent to which they are attacked by *Lochmaea suturalis*?
2. What is the impact of *L. suturalis* on the flowering success and vegetative regeneration of different ericaceous species?
3. **What is the impact of *L. suturalis* on floral resource availability for foraging bumble bees and honey bees?**



Also, over whole season significantly reduced foraging by both bumblebees*** and honey bees* on Erica species but by just honey bees on Calluna***.
[Pearson correlation, ***P<0.001; **P<0.01; *P<0.5]


Honeybee
Bumblebee
Dry
Wet
July
August
September
Calluna vulgaris
Erica cinerea
Erica tetralix
Erica ciliaris
Cal
E. cin
E. tet
E. cil

Conclusions

- The immediate and long term impact of *L. suturalis* on hymenopteran pollinators is greatest where heathland consists of stands dominated by mature *Calluna vulgaris*
- Impact may be mitigated by maintaining a landscape mosaic of heathland and other habitats including a high abundance of early successional stages heathland.

Thank you !