Cicerbita alpina – Alpine blue sow-thistle

Royal Botanic Garden Edinburgh

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- At brink of extinction in the UK
- Categorised Vulnerable in Red Data List for Great Britain
- Protected under the Wildlife and Countryside Act 1981
- A priority species in the Scottish Biodiversity Route map to 2020
- Included in the Cairngorms Nature Action Plan
- Threatened by grazing, landslides, climate change

Flagship for species recovery through changed land management

Cicerbita alpina – Field work

Corrie Kander

Why no reproduction?

- Overgrazing?
- Lack of pollinators?
- At edge of distribution range?
- Climate change?
- Genetic problems?

Lochnagar

Caenlochan

Corrie Fee

Cicerbita alpina – Field work

Corrie Kander

Data collection

- Counts / monitoring
- Collect plants for *ex-situ* collections
- Collect leaves for genetic analyses

Lochnagar

Caenlochan

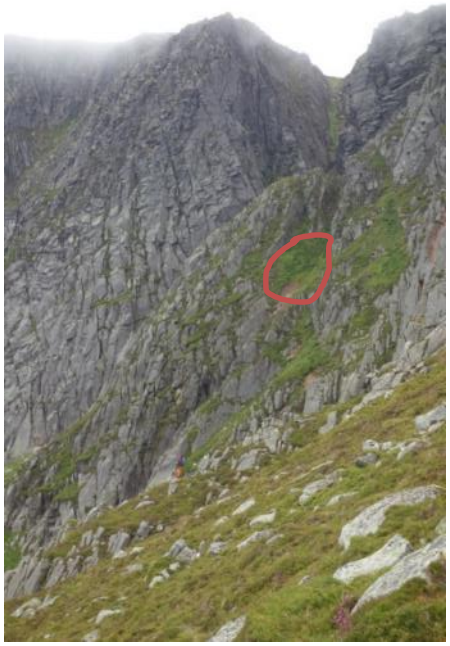
Corrie Fee

Conservation Genetics

Corrie Kander
≥ 7 plants

Genetic Data

High Relatedness between individuals



Lochnagar
≥ 8 plants

Caenlochan ≥ 3 plants

Corrie Fee ≥ 13 plants

Cicerbita alpina – Ex-situ conservation

Plant Conservation Nursery

Cicerbita alpina – Ex-situ conservation

Plant Conservation Nursery

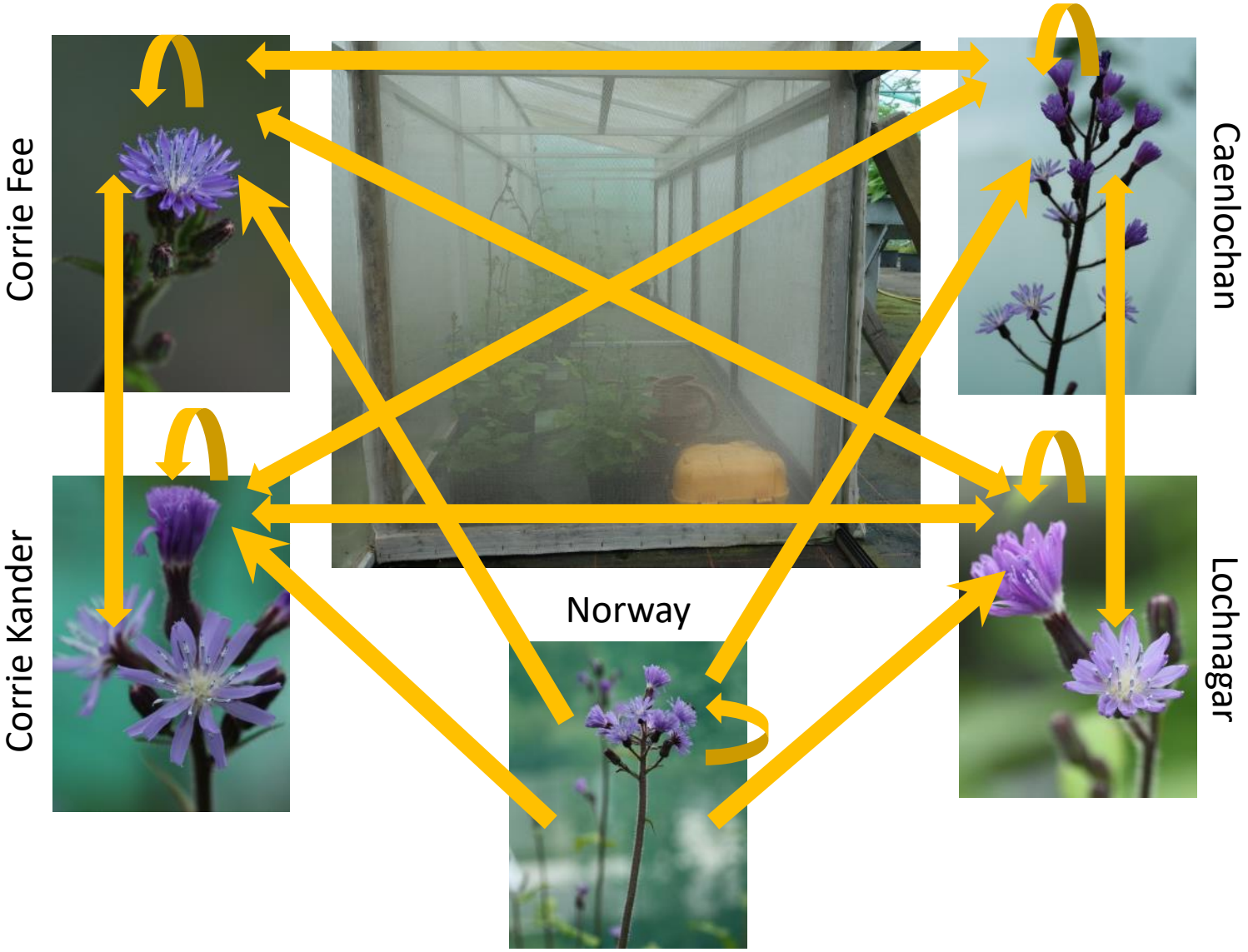
Bulking up rootstocks for recovery

Research on reproductive biology

Biosecurity

Cicerbita alpina – Ex-situ conservation

Cross-pollination experiments



Cicerbita alpina – Ex-situ conservation

2017 + 2018 cross pollination experiments, PRELIMINARY results:

375 seedlings in total

- Crosses between populations
  5% germination success
  Leaf area size: 35.7 cm
  92% survival after 1 year

- Crosses within populations
  4% germination success
  Leaf area size: 30.6 cm
  96% survival after 1 year

- Selfing
  3**% germination success**
  Leaf area size: 26.8 cm
  82% survival after 1 year

→ Species is self-compatible
→ Crossings between populations increases fitness?

Cicerbita alpina – Translocations

2017 Conservation Translocations

1. Morrone Birkwood

2. Mar Lodge

3. Corrie Fee

Plants from 2 provenances were used for translocations – Corrie Kander and Lochnagar

Cicerbita alpina – Translocations

Cicerbita alpina – Translocations

Monitoring

Corrie Fee

Cicerbita alpina – Translocations

Cicerbita alpina – Alpine blue sow-thistle

In a nutshell

Genetics

- Only few individuals remain (<50)
- Scottish sites highly inbred & low genetic diversity
- Cross pollinating increases germination, plant size and survival
- Self-compatible

Translocations

- Survival at all 3 locations
- Additional fencing needed at easy accessible sites
- Flowering stage reached only at protected sites
- Lochnagar provenance higher survival rates

Conclusion

- Grazing has the most imminent impact on plants
- Following long-term isolation inbreeding has an additional impact on reproduction
- Ongoing monitoring and research needed
- The case of *C. alpina* represents a wider conservation issue that many other species are facing in the UK

Thank You

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