Ecology and management of invasive *Poa annua* on sub-Antarctic Macquarie Island

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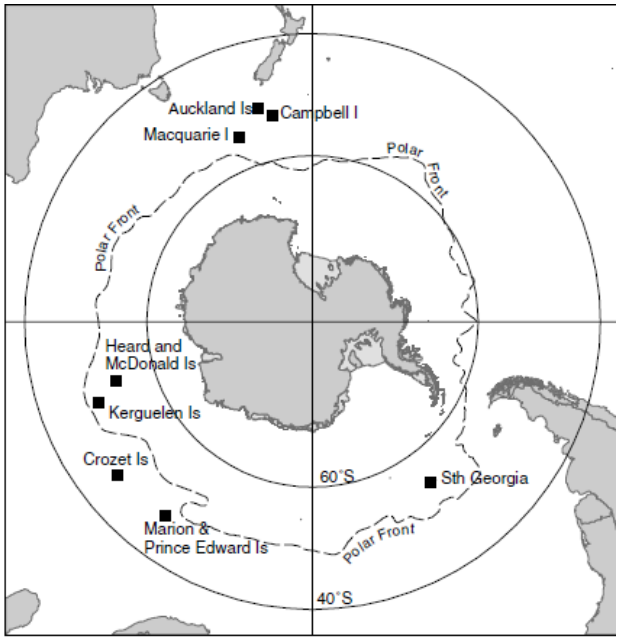
Sub-Antarctic

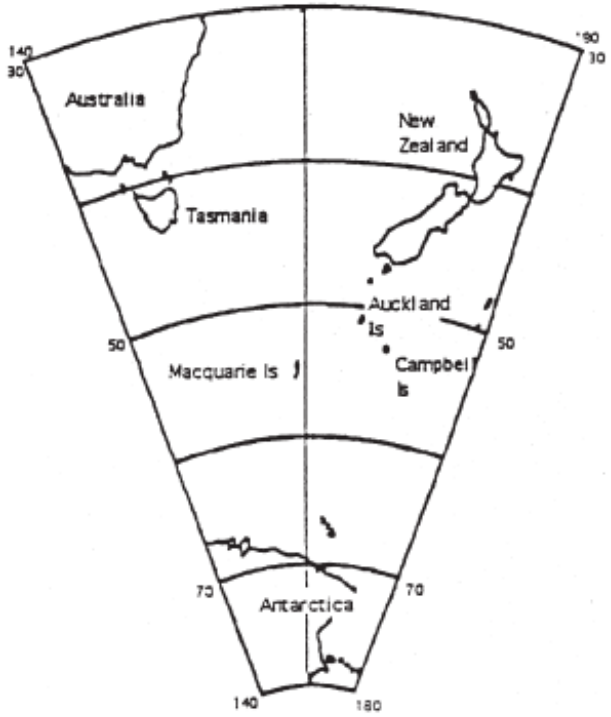
- 45-60 °S
- Wet, windy and cold
- Depauperate flora and faunas > isolation and harsh climate
- High conservation value > wildlife, endemics, unique environments



Getting there….

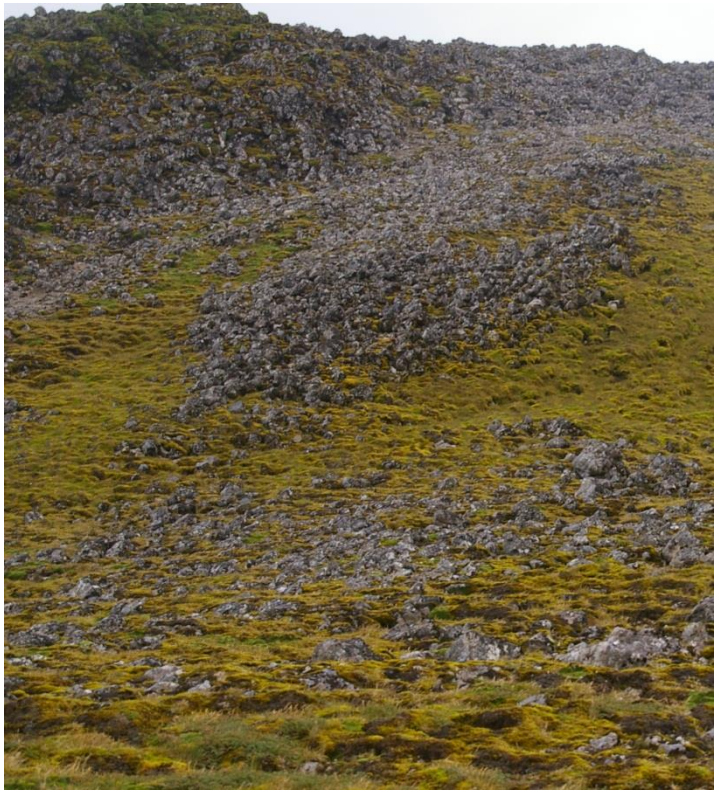
Macquarie Island: Location

- 54°30’S, 158°57’E
- Southern Ocean
- Between Tasmania and Antarctica



Macquarie Island: Natural history

- Climate: wet, windy, cold
- Biogeography: elongated, undulating plateau, oceanic origin
- Soils: peats, dry tundra
- Flora: 42 vascular plants, many bryophytes, 3 aliens
  Fauna: seals, albatross, penguins, seabirds



Macquarie Island: History

- Discovered in 1810
- 100 years of wildlife exploitation
- First botanical collections made in 1824
- Proclaimed a Wildlife Sanctuary in 1933
- ANARE station established in 1948
- World Heritage Listed in 1997
- Managed by TasPWS

- Wildlife harvesting, disturbance, introduction of alien flora and fauna

Invasive species in the sub-Antarctic

- Biological invasions substantially affect the structure and function of ecosystems
- Most serious threat to the conservation of the sub-Antarctic
- Over 108 alien vascular plants
- Majority are transient/persistent and restricted, some aggressively spreading and invading
- Risk of invasion increasing

Poa annua

- Most widespread sub-Antarctic weed
- Mediterranean origin > cosmopolitan
- Classified as an invasive alien
- High phenotypic and genotypic variability, high fecundity, adapted to many habitats, highly tolerant
- Infests disturbed areas

Poa annua on Macquarie Island

- Common and widespread
- First recorded in 1873
  Colonises disturbed sites
- Competes with native species for space
- Maybe outcompeted with removal of herbivores

Ecology and management of *Poa annua* on Macquarie Island

- **Aim to understand the ecology of *Poa annua* in the sub-Antarctic environment**

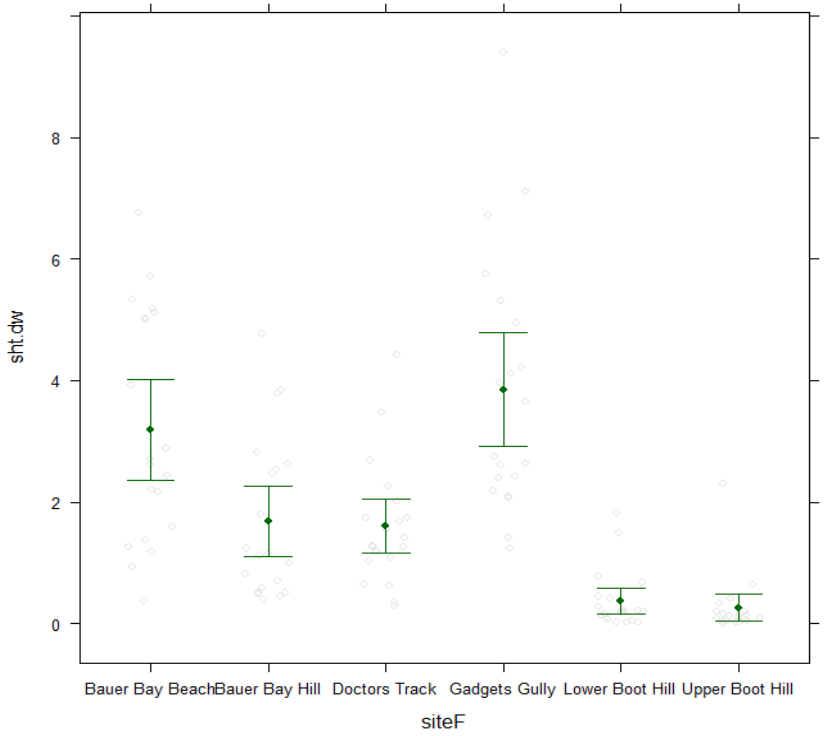
- **And to investigate the effectiveness of a range of management techniques**

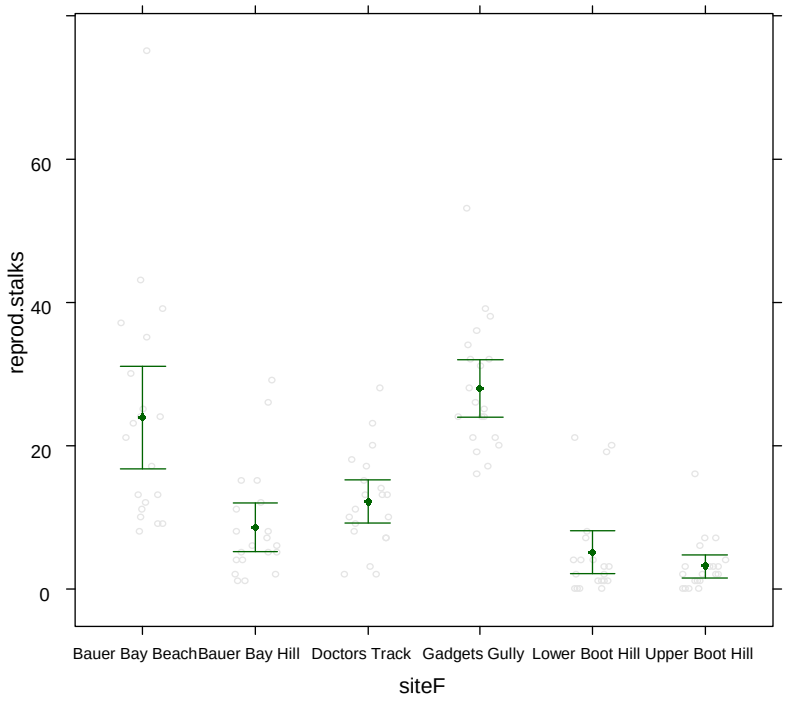
Ecology – community floristics

– Vegetation surveys

Ecology – biomass partitioning

– Roots vs shoots vs reproductive material at different infestation levels





Ecology – longevity

– Tagged individual plants (annual vs perennial)

Ecology – seed bank

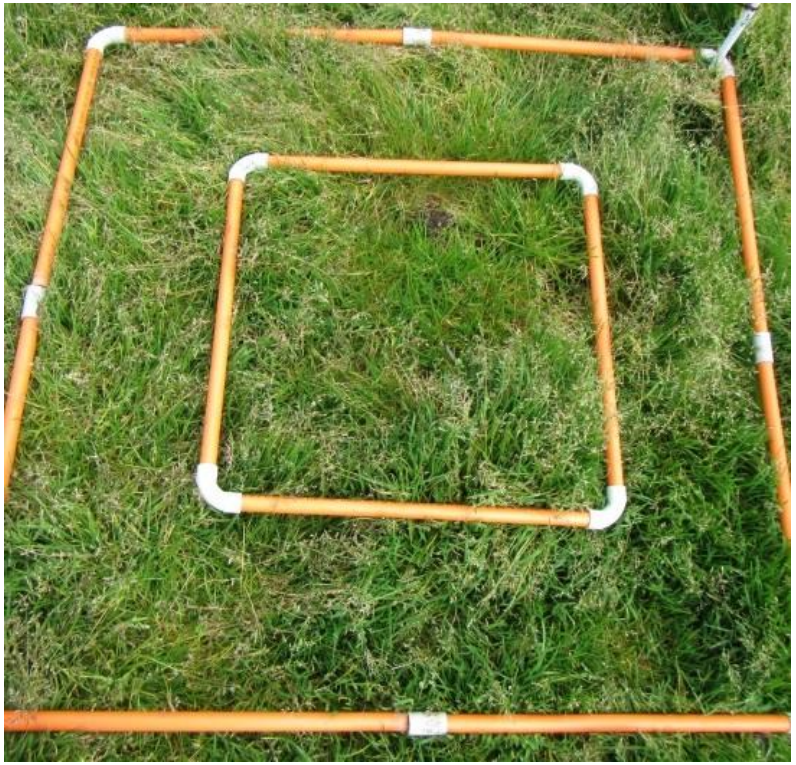
– seed viability, longevity, distribution

Ecology – competition

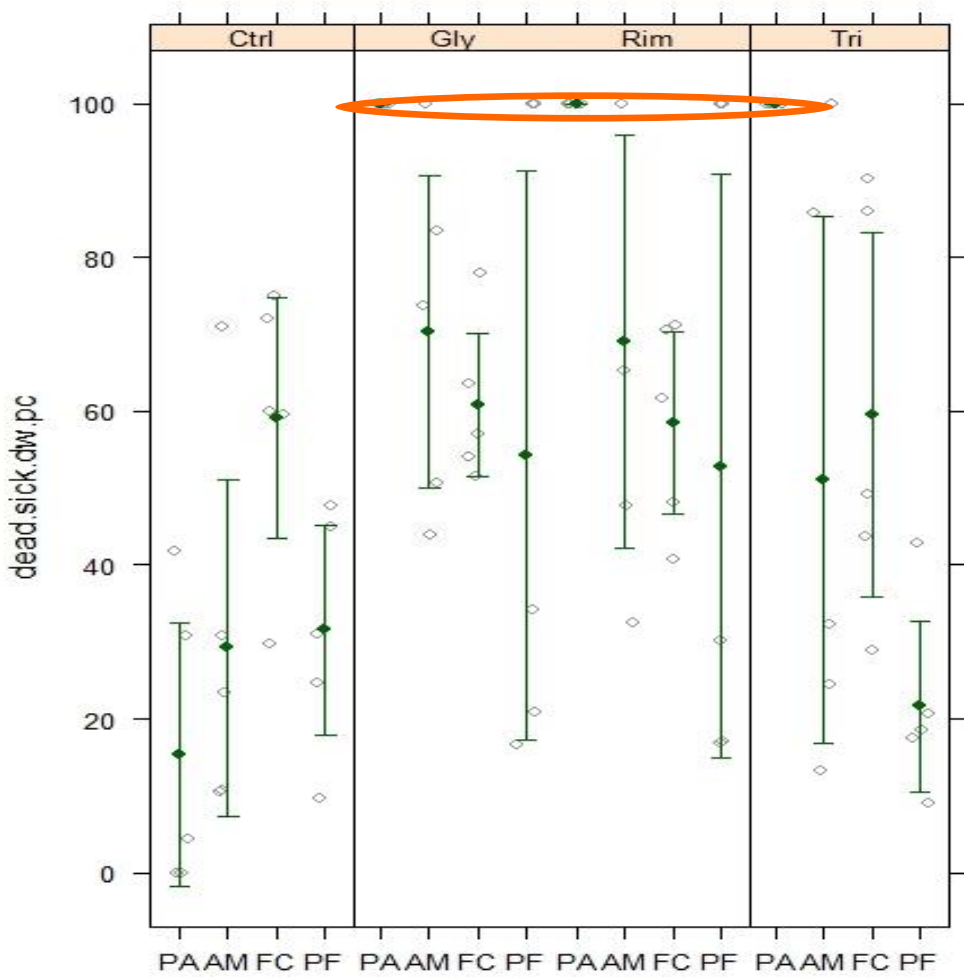
– between *Poa annua* and native grasses

Management – physical disturbance

- Manual removal of biomass



Management – herbicide efficacy



Management – herbicide retention and movement

Challenges...

Resupply and homeward...