



Pushing the envelope – increasing our capacity for managing pest species on islands





Of 70,000 species assessed for IUCN Red List...

- 40% of amphibians
- 25% of mammals
- 13% of birds
- 33% of warm-water corals
- 34% of conifers...

...are threatened

Global biodiversity decline



Extinction rates for birds

- ancient bird extinction rates ~ 1 species per hundred years
- Recent extinction rate 1 species per year
- Data for endangered birds predict 10 species per year if not actively protected

Global biodiversity decline



Habitat loss

- Deforestation of tropical forest – Brazil/Indonesia
- 5 football fields cleared illegally every minute between 2000 and 2012
- 200,000 square kilometres
- Driven by EU and US demand for beef, leather and timber



Global biodiversity decline



Habitat loss

Solutions to deforestation are largely:

- ☐ political
- ☐ economic
- ☐ cultural



Global biodiversity decline

Climate change



Global biodiversity decline

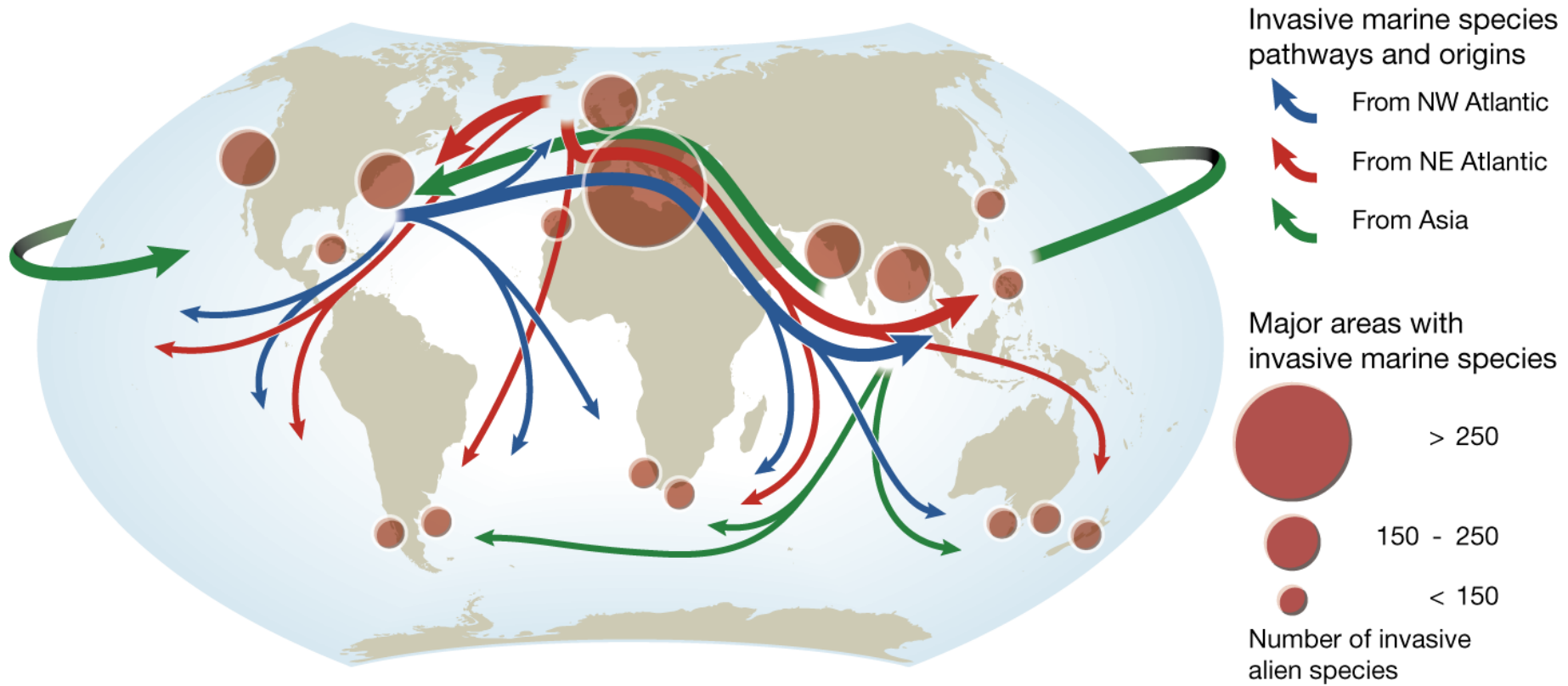


Invasive species

- Invasive species continue to spread around the globe
- Rate of invasions increases with global trade
- Major contributors to biodiversity loss through competition, predation and habitat modification
- Responsible for ~60% of island animal extinctions



Global biodiversity decline



Progress globally



- *Guidelines for Invasive Species Management* in the Pacific (Pyeongchang October 2014) – states prepare National Invasive Species Strategies
- *Aichi Biodiversity Target 9* – invasive species pathways identified & prioritised
- *UN guidelines to minimise risk of invasive species targeting pets & aquarium species* (Oct 2014)

Strategies underway



- Australia has had at least 36 invasive species entering the country since 2000
- Senate Enquiry into Environmental Biosecurity – due to report December 3rd 2014
- ‘Inquiry into preventing invasive species harmful to the natural environment’

Strategies underway



Despite the efforts of countries around the world, the trend of invasive species invasions shows no signs of slowing down.



Progress globally



Islands are important for conservation

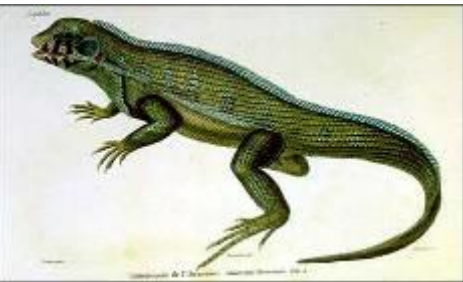
- 3% of earth's land area
- 20% of all species
- 50% of endangered species



Most extinctions (80%) are on islands



95% bird extinctions



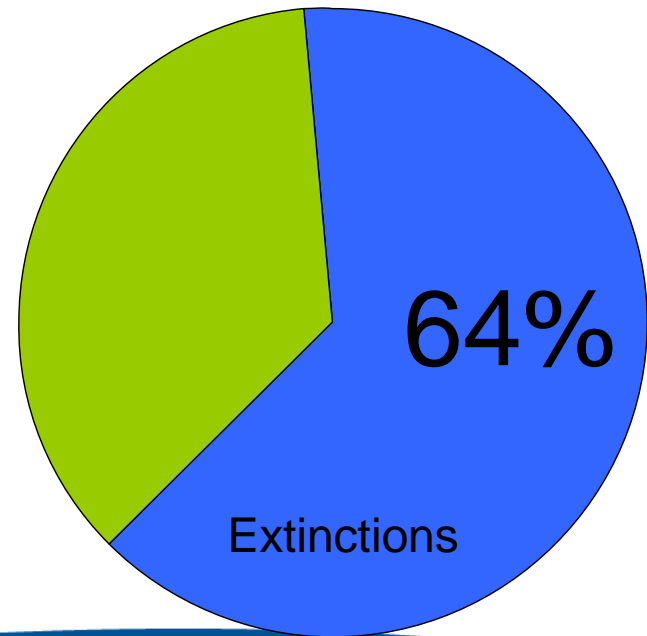
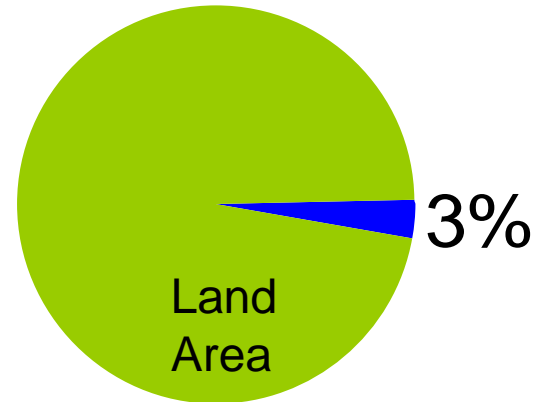
90% reptile extinctions



69% mammal extinctions



68% plant extinctions

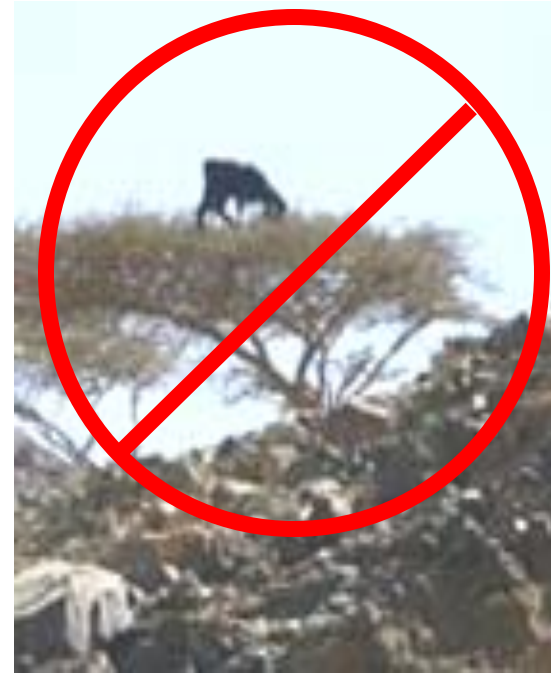


Islands



Mainland

(IUCN data)



Invasive species can be removed

Ecosystems can recover

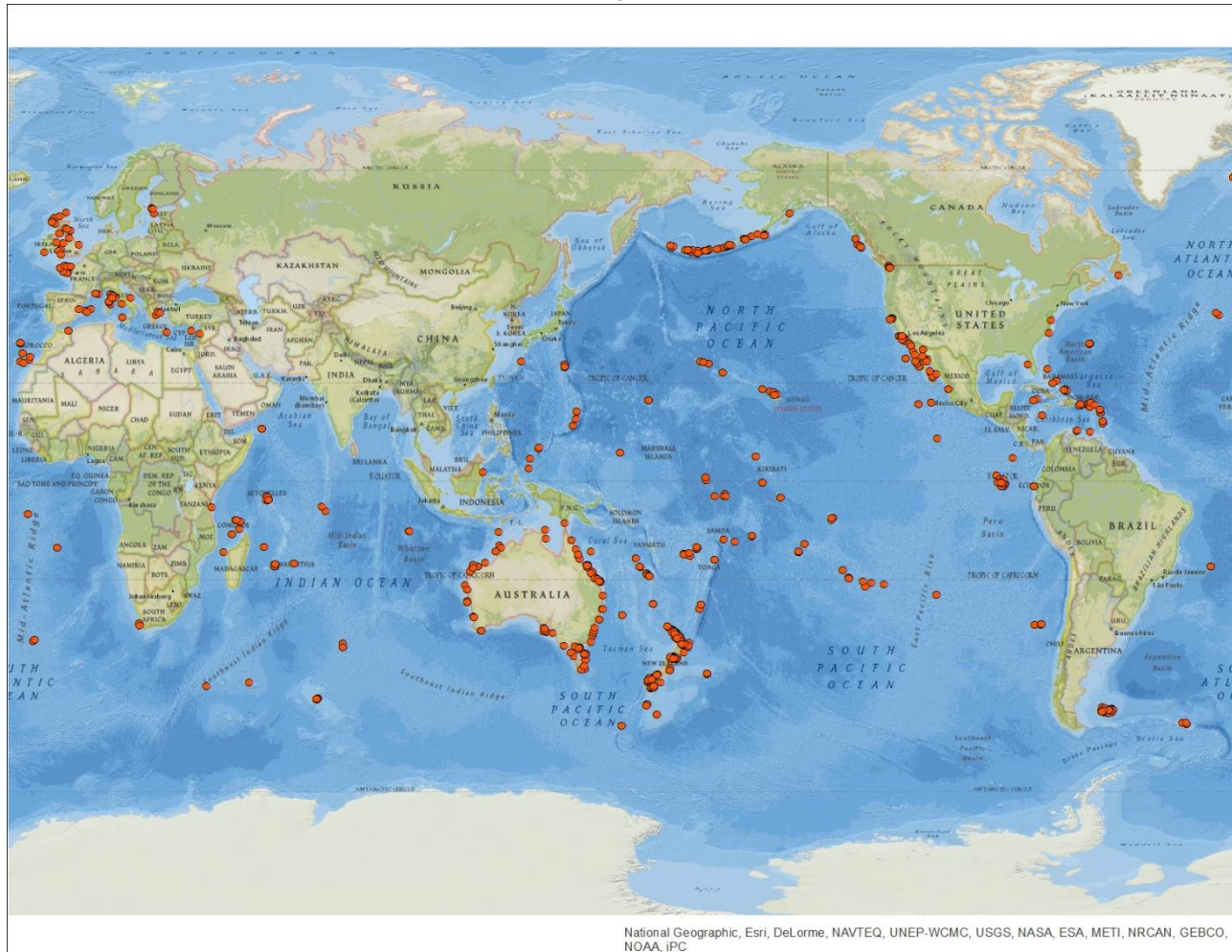
Islands are conservation opportunities



- 5 criteria for successful eradication
- Methods developed for many mammal and bird species
- Strong potential for ecosystem and species recovery



Islands are conservation opportunities



Global island eradications



- Partners with Mexican govt and various Mexican institutions
- Achieved the removal of 48 invasive species from 31 islands of NW Mexico totalling >50,000 ha
- Current pace would see all invasive species removed from all Mexican islands by 2025





- USA – based
- Partners with governments, institutions and other NGOs
- Worked on 52 islands worldwide
- Specialise in removing invasive species from islands



Preventing Extinctions



Island Conservation



- Active in the UK and UK Overseas Territories (Caribbean, Pacific, South Atlantic)
- Published paper outlining priorities for pest eradication in UKOT
- Planning mouse eradication on Gough Island, rats on Henderson



giving
nature
a home

RSPB



- History of island pest eradications and species reintroductions
- Department of Conservation
- Community groups



- 48 mainland and 14 near-shore sanctuary sites 53,000 ha
- pest-free islands 36,480 ha

Total area 89,530 ha

New Zealand

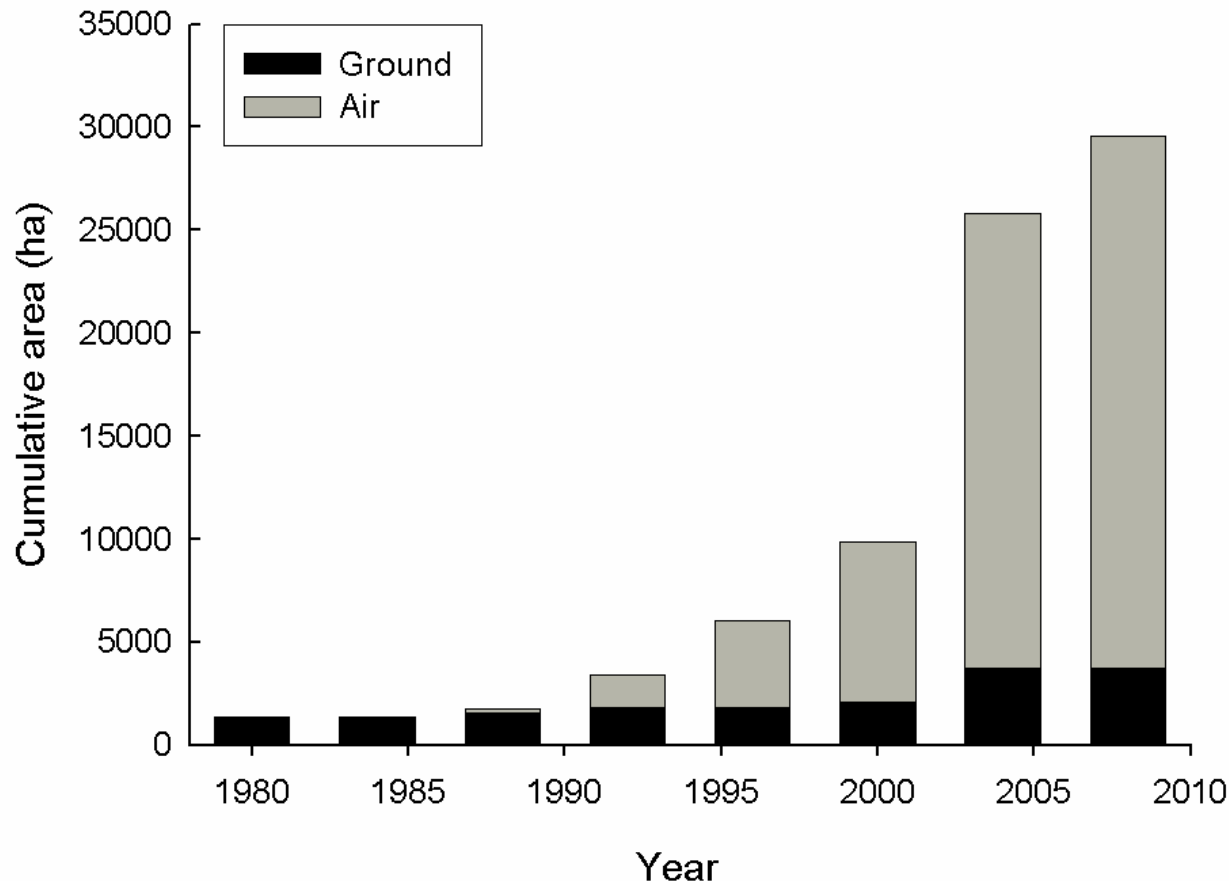


- Island eradication efforts more fragmented
- State by state initiatives
- Western Australia/Tasmania /NSW



Island eradications

Ground (<i>n</i> islands)	10	12	15	23	23	24	24	24
Air (<i>n</i> islands)	0	0	1	20	28	36	41	47

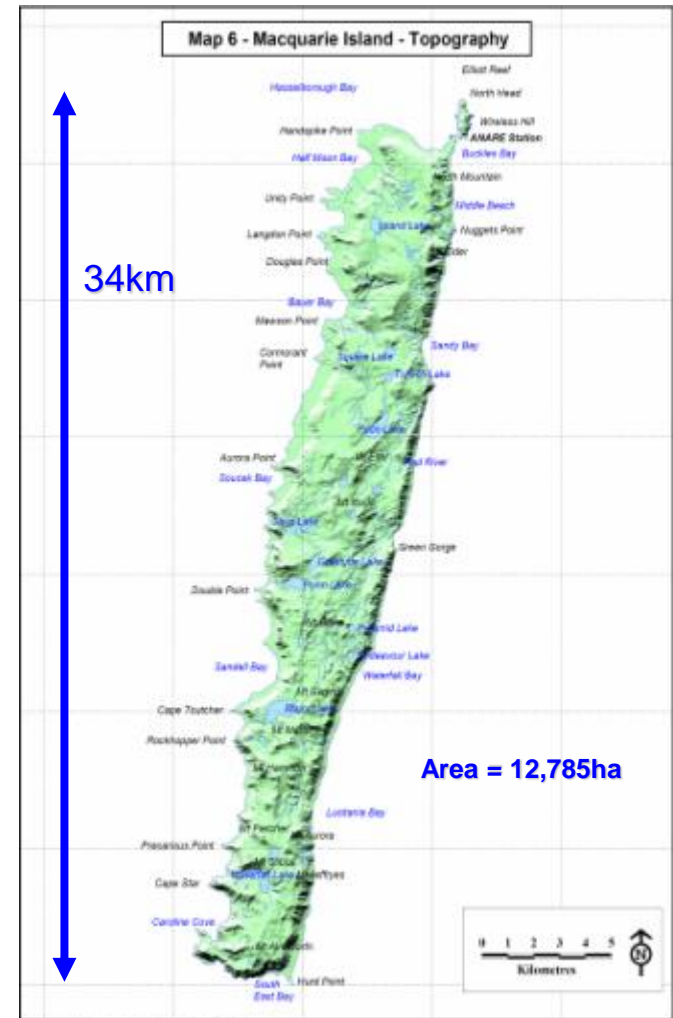
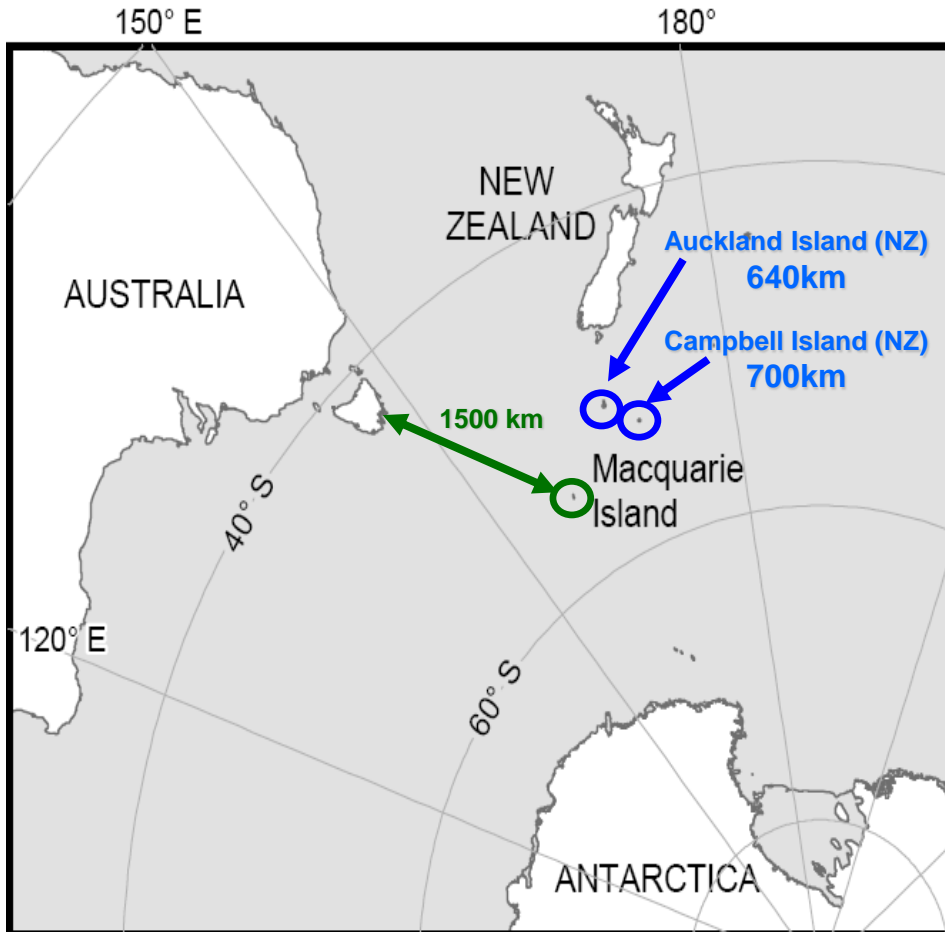


1985-2010:

14 forest bird species established by translocation

On 44 islands from which pest mammals eradicated

Bellingham et al 2010



Satellite data provided by Australian Antarctic Data Centre

Macquarie Island



Australian Government

Introduced vertebrate pests



Tussock Loss - Tourist Boardwalk 2000



© Noel Carmichael

Rabbit grazing impacts



Poa foliosa
(tussock) - heavily
grazed by rabbits.

Rabbit grazing impacts



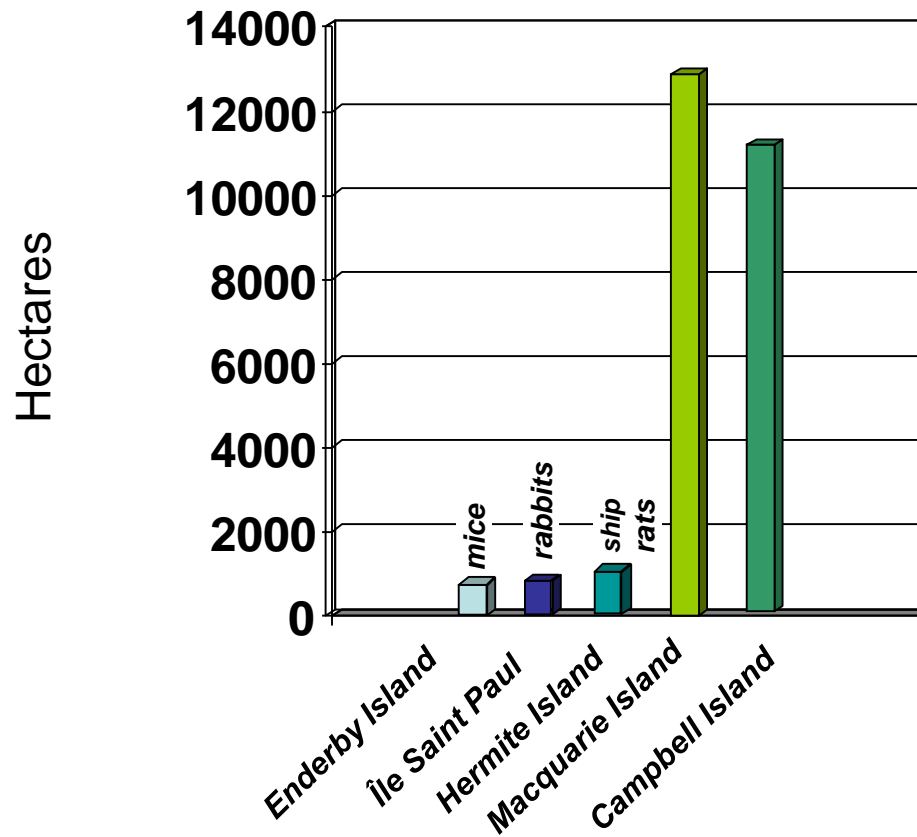
Rabbit grazing impacts



- Rats from Campbell Island (11,300ha) 2001
New Zealand
- Rats, cats, mice, rabbits, hedgehogs, stoats from Rangitoto/Motutapu (3,800 ha)
New Zealand
- Rats and cats from Raoul Island (3,000ha) 2002
New Zealand
- Rats from Rat Island (2,700ha) 2008
Alaska
- Rabbits and rats from St Paul Island (800ha) 1993
France

© Noel Carmichael

Recent island eradications



Introduced vertebrate pests

Campbell Island





MIPEP Objectives

- Macquarie Island biodiversity is restored to a more natural balance - free of the impacts of introduced pest species.
- Vegetation, seabird and invertebrate populations have recovered to levels naturally supported by the environment.



© Noel Carmichael

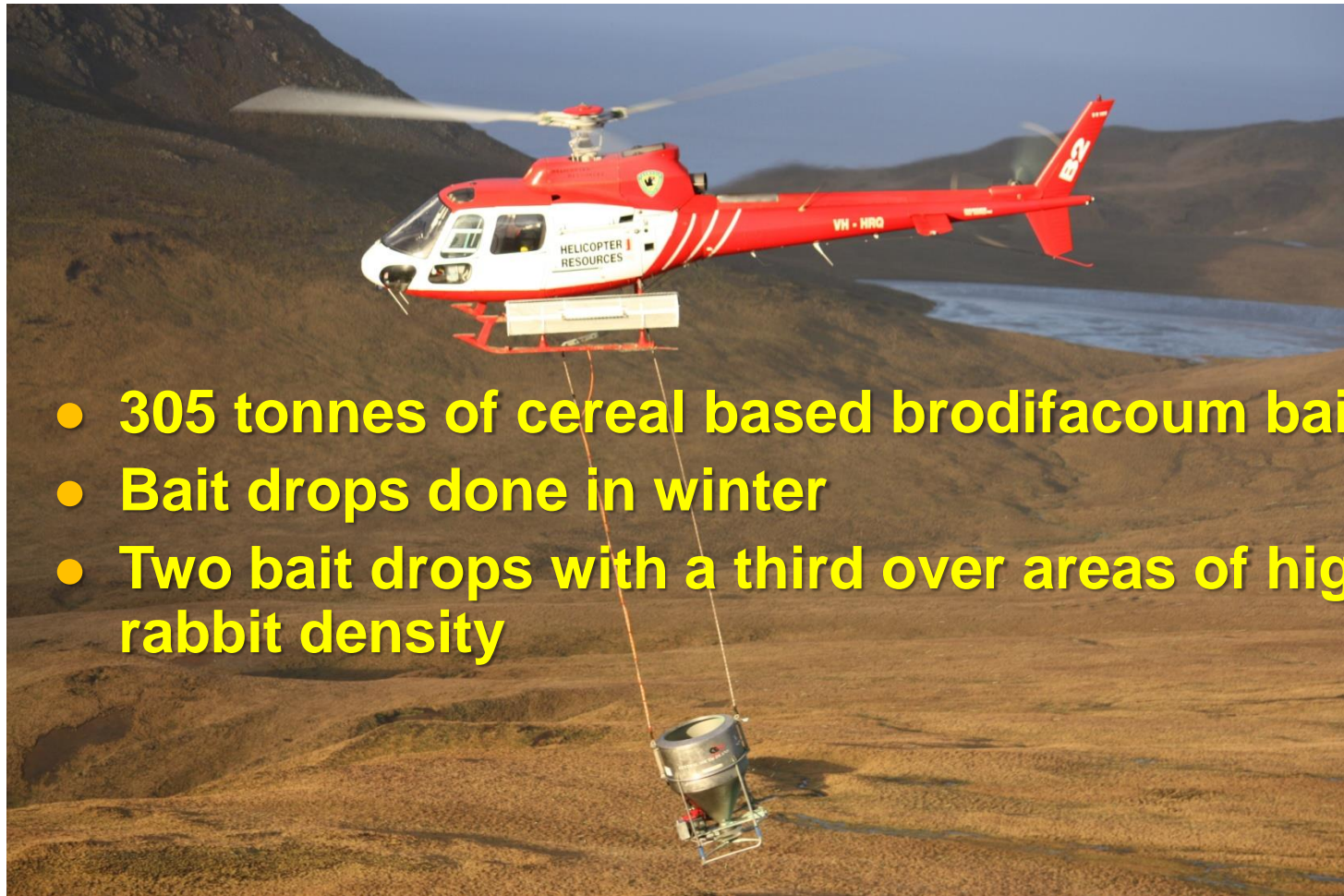
Project vision



- Regulatory
- Staffing
- Strategy
- Communications/awareness
- Logistics
- Procurement/contract management
- Dog training
- Peer review



Planning



- 305 tonnes of cereal based brodifacoum bait
- Bait drops done in winter
- Two bait drops with a third over areas of high rabbit density







Non-target species





13 rabbits killed post-baiting

One sweep of the island by hunters in 2013 (of 2) – 28,000 km

Total coverage over 3 years – 94,000 km

Hunting phase



Recovery



Recovery



2005

2014



Recovery



- **Funding commitment agreed at commencement for 8 years ahead**
- **Detailed planning**
- **Peer review**
- **Adapt to changing circumstances**
- **Dedication of staff**
- **Can-do attitude and determination to overcome obstacles**

Factors in successful outcome



South Georgia
rats, reindeer

Pushing the boundaries – island size



- Lord Howe Island
- Floreana
- Stewart Island
- Great Barrier Island



Pushing the boundaries – inhabited islands



Predator-Free NZ

Facts and figures:

- NZ land area: 26.9M ha
- Cost of multi-pest control: \$300/ha
- Cost of PFNZ: \$9B minimum





- Macquarie Island Pest Eradication Project teams
- Tasmania Parks and Wildlife Service
- Clare Stringer (RSPB)
- Karl Campbell (Island Conservation)
- Andrea Byrom (Landcare Research)

Acknowledgments