

# Islands biodiversity program: New Zealand case study

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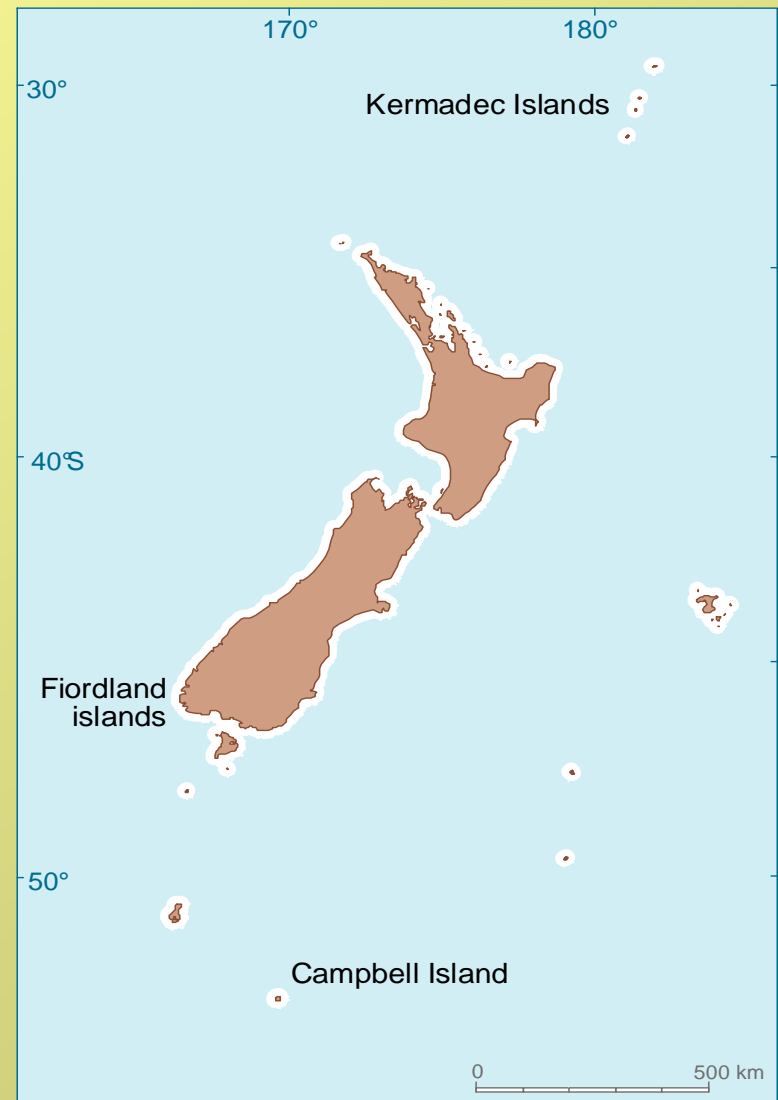
# Outline

- Global importance of New Zealand islands
- Management of threats to flora and fauna from invasive alien species (mammals)
- Four examples as case studies
- National strategies for island management
- Challenges ahead: balancing people and nature tested against CBD focal areas

# Islands as a resource

- From 29-52°S, distance of 2 800 km
- 735 islands > 1 ha
- About 250 managed by Department of Conservation
- Two large archipelagos World Heritage sites

Source: Parkes & Murphy (2003).

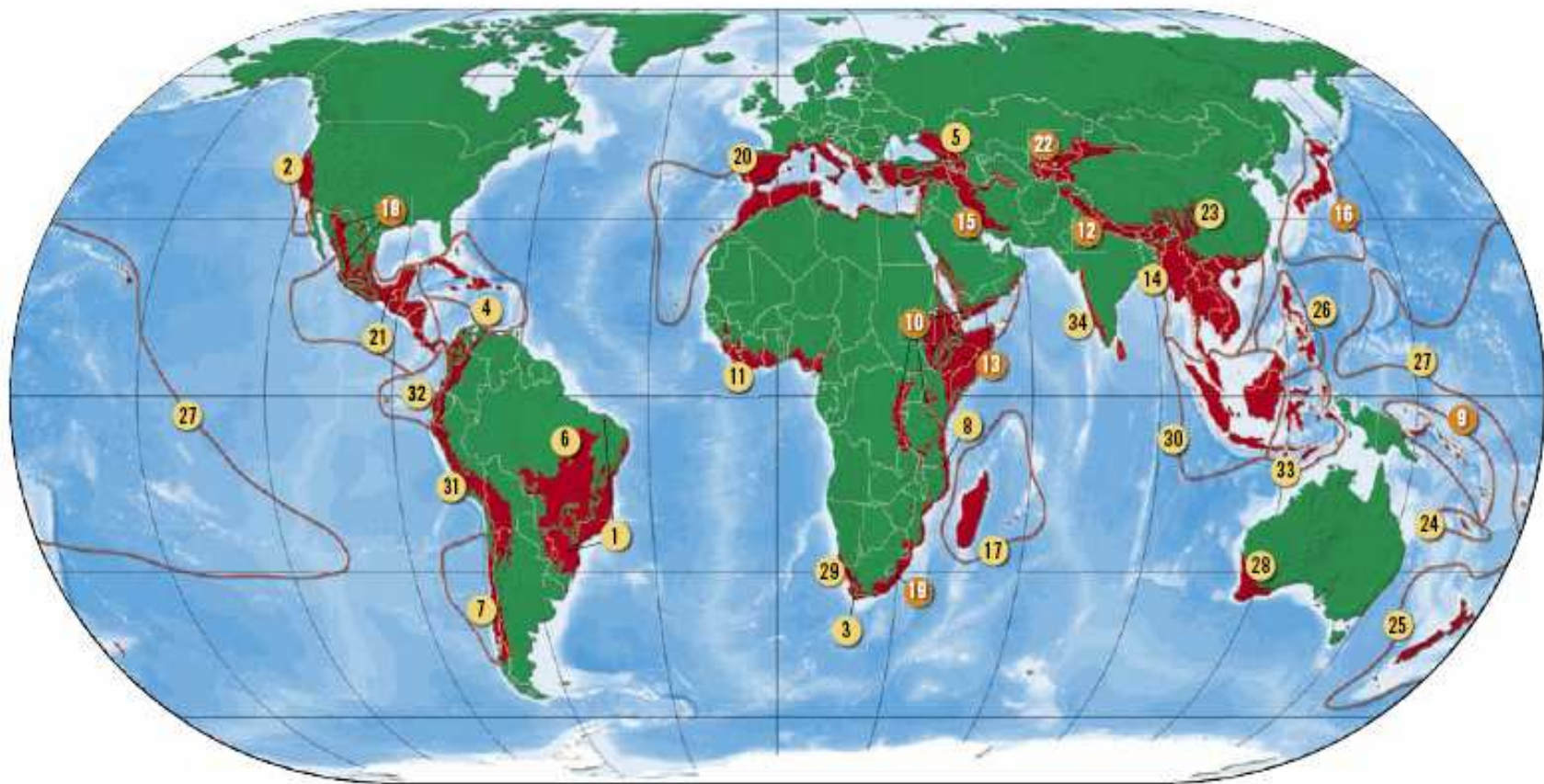


CI FACTS



CONSERVATION  
INTERNATIONAL

# Biodiversity Hotspots



# Why is NZ a biodiversity hotspot?

Of 34 hotspots ranks:

- 19 for endemism of plants and vertebrates to genus
- 2 for endemism to families (vertebrates)
- 2 for coverage in protected areas (27.5%)
- 1 for high level protection (22.1%)

Source: Mittermeir et al. (2004)

# New Zealand's terrestrial oddities



# New Zealand: “seabird capital”

- Total world seabird fauna: 350 spp
- Recorded from NZ: 140 spp (39%)
- Breeding in NZ: 84 spp (23%)
- Largest fauna anywhere with 35 (42%) endemic

Source: Taylor 2000

# Biodiversity oversights





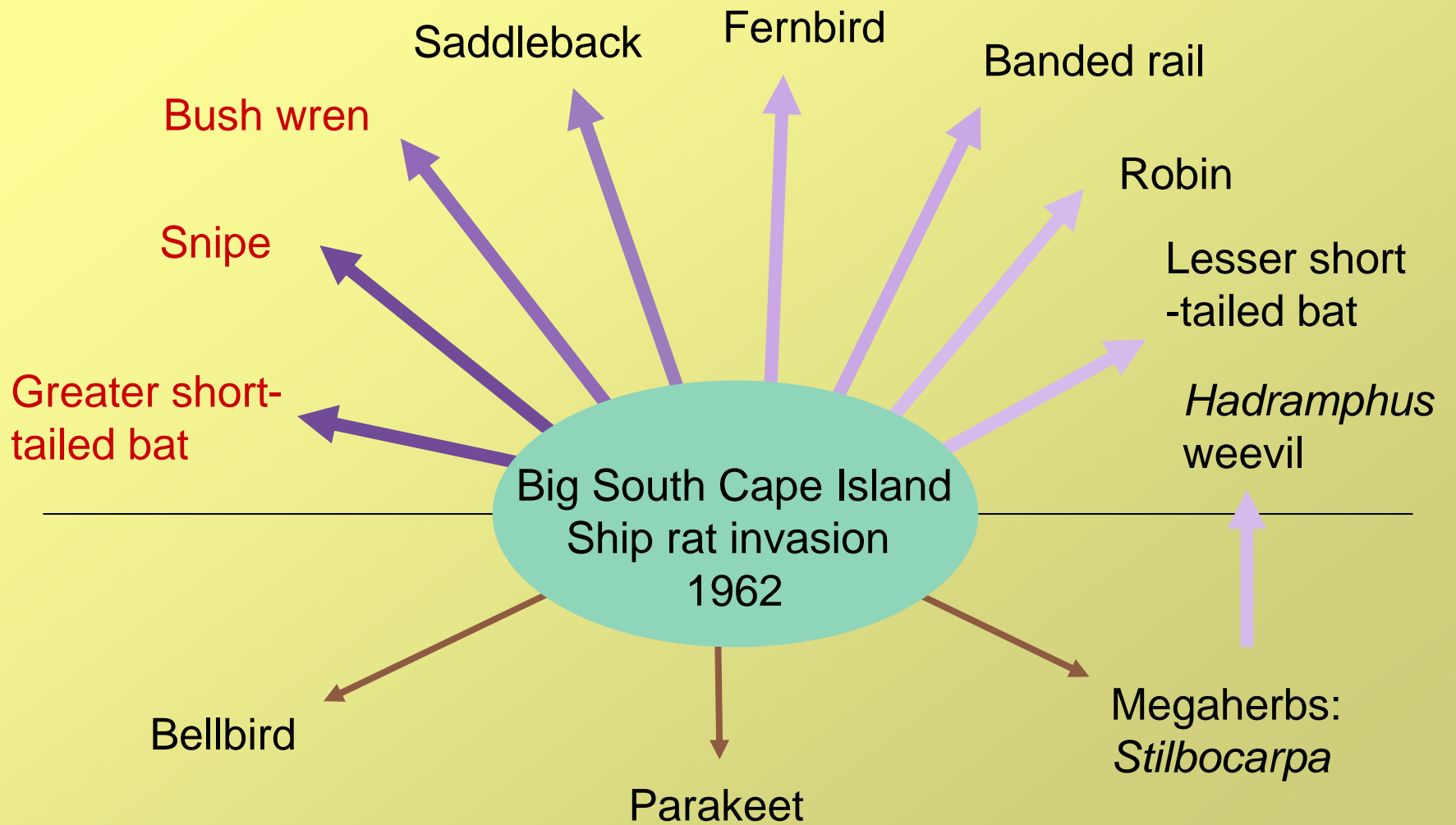
# Why is NZ a threat hotspot?

- On CI list: 4 for species of threatened birds
- 40% of avifauna extinct
- Birds (+reptiles, amphibians and invertebrates) all threatened by invasive alien species



## Extinction

## Extirpation



Big South Cape Island  
Ship rat invasion  
1962

## Suppression

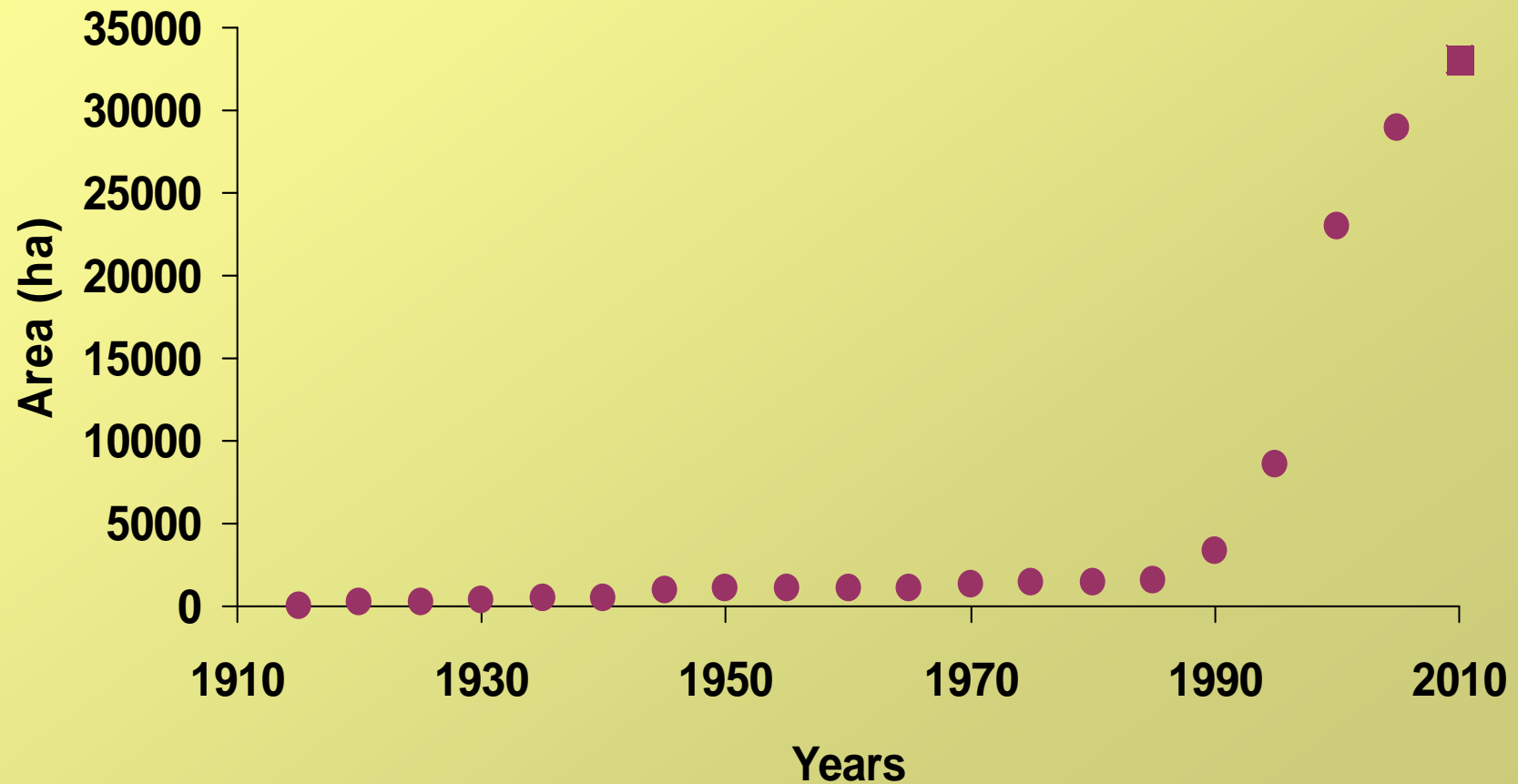
# Island invasive mammals\*

- House mouse (14)
- Pacific rat (35)
- Ship rat (18)
- Norway rat (42)
- Weasel (1)
- Stoat (20)
- Ferret (1)
- Hedgehog (1)
- Cat (10)
- Brushtail possum (15)
- Rock wallaby (3)
- Goat (19)
- Sheep (4)
- Red deer (1)
- Pig (11)
- Cattle (4)

(Success claimed)

\*Source: ISSG

# Cumulative area cleared of mammals



# Islands free of mammal pests

Island area (ha)	No.	Cleared of pests (Total %)
10 000 – 100 000	6	1 (17)
1000 – 10 000	23	6 (26)
100 – 1000	57	17 (37)
<100	646	62* (34)

Source: Parkes & Murphy (2003)  
with additions to 2007

\*Includes reinvaded islands

# Summary: by number/area

- 162 naturally pest free islands, 158 of which (97%) < 100 ha
- By area, 2162 ha naturally pest free
- More than 60 “permanently” cleared of all introduced pests
- About 29 000 ha added (1400% increase)

Unprecedented achievements?

# Huge: Campbell Island

- 52°S
- Area: 11330 ha
- Nature Reserve
- W. Heritage site
- Cattle to 1984
- Sheep to 1991
- Cats died out 1990s
- Norway rat to 2001
- Cost NZ\$2m



# Campbell known for:

Rock-hopper penguins



Flowering megaherbs



Albatrosses & mollymawks

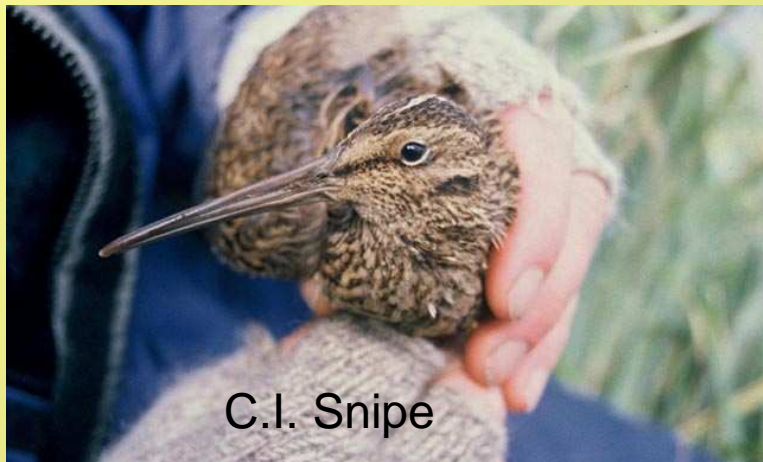




# Campbell Is losses:

- Merganser – total extinction
- Parakeet – total extinction
- Flightless teal
- Snipe
- Pipit
- Burrowing seabirds including prions and several species of petrels
- Rock hopper penguins resident, 90% loss
- Flightless crickets, giant slugs, large weevils rare

# Campbell Island gains



# Hot: Raoul Island

- 29°S
- Area: 2938 ha
- Nature Reserve
- Goats to 1972-1984
- Pacific rat to 2002
- Norway rat to 2002
- Cats to 2004
- Goat cost NZ\$ 1m
- Rat/cat cost NZ\$ 1.2m



Raoul Island crater lakes

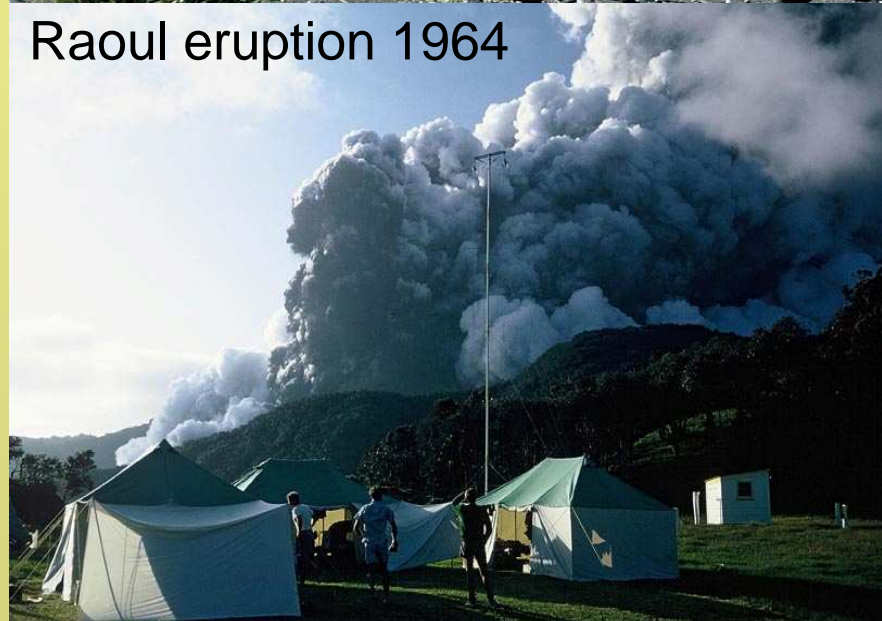
# Raoul known for:



**Kermadec nikau palm**



**Sooty terns**



**Raoul eruption 1964**

# Raoul losses

- Megapode, fruit pigeon, forest parrot?  
Extinct
- Parakeet (locally lost)
- At least 6 species of seabirds (locally lost)
- Endemic plants heavily suppressed by goats
- Sooty terns, Kermadec petrel, black-winged petrel, wedge-tailed shearwater heavily suppressed by cats

# Raoul Island gains



# Hard: Little Barrier Is

- Area: 3083 ha
- Nature Reserve
- Cats to 1977-80
- Pacific rats to 2004
- Cats cost ?????
- Pacific rats: NZ\$ 0.5m



# Little Barrier known for:





# Plus....

Gigantic invertebrates

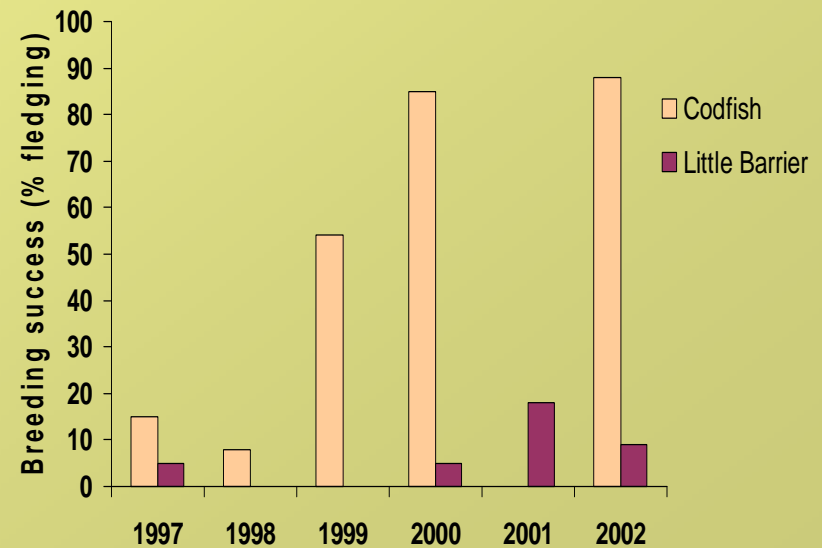
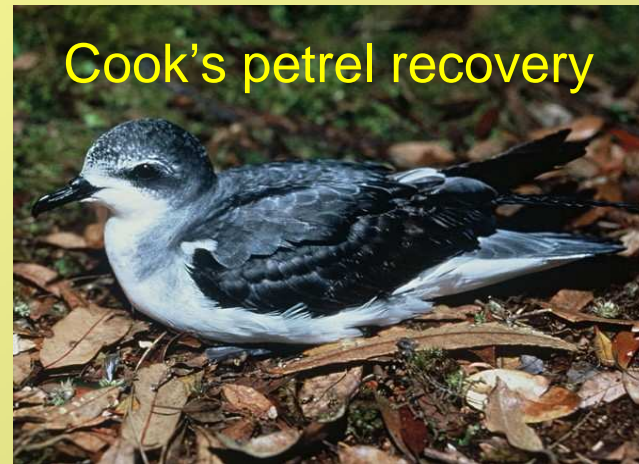


Wetapunga

# Little Barrier losses

- Snipe (extinct) (rats?)
- Grey-faced petrels local loss (cats)
- Black petrels suppressed (cats)
- Saddleback local loss (cats)
- >5 species seabirds local loss (cats & rats)
- Cooks petrel suppressed (cats & rats)
- Tuatara suppressed (rats)
- >6 species lizards suppressed (rats)

# Little Barrier gains:



# First: Korapuki Island

- Area: 18 ha
- Wildlife Sanctuary
- Pacific rats to 1986
- Rabbits to 1987
- Pacific rats cost:  
\$6800



# Korapuki known for:

Nothing much in particular except:

- Highly modified vegetation
- Regularly burned up until beginning of 20<sup>th</sup> Century
- Absent large invertebrates
- Depleted reptiles

# Korapuki gains:



Diving petrel recovery



Robust skink reintroduction



Duvaucel's gecko recovery



Tusked weta

# Eradication benefits

- Plants: > 40 endemic species (Great King)
- Invertebrates: 13 species
- Amphibians: 2 species (50%)
- Reptiles: 26 species (33%)
- Terrestrial birds: 29 species (40%)
- Seabirds: 12 species (7%)
- Mammals: 1 species (bat) (50%)

# Summary of achievements

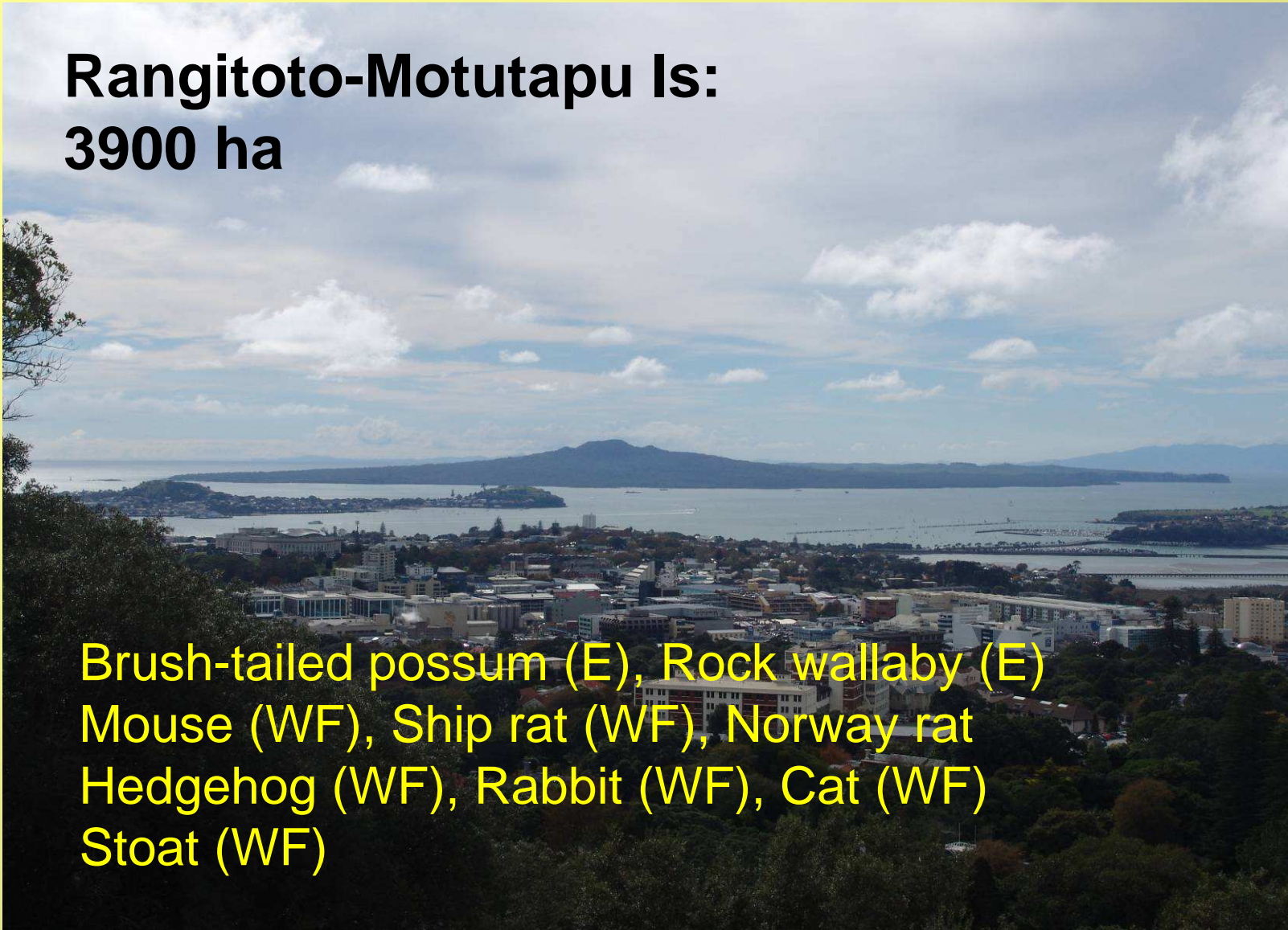
- Four examples from high end protected islands
- Three large, complex and recent but still with some rapid changes
- Positive responses from >60 vertebrate species
- But: overlooks complexities of goals with different land tenures



# On the horizon

**Rangitoto-Motutapu Is:  
3900 ha**

**Brush-tailed possum (E), Rock wallaby (E)  
Mouse (WF), Ship rat (WF), Norway rat  
Hedgehog (WF), Rabbit (WF), Cat (WF)  
Stoat (WF)**



# Complexities of land tenure

Of the ca 70 cleared islands:

11 reserve types

- 4 different Acts of Parliament
- Private-Public partnerships (esp with Maori)
- Iwi (Maori) land
- Private freehold land



# Island management

- Natural recovery: resident species responses, recolonisation, reappearance
- Reintroductions: assisted recovery

## 36 high-end island reserves

- Introductions: species management
- Recreation: community led projects e.g. planting and reintroductions
- Protection: historic sites and landforms

## 15 low-end accessible island reserves

# Catering for broad goals

- National island management strategy
- Central theme: ecological integrity.

*“The full potential of indigenous biotic and abiotic features, and natural processes, functioning in sustainable communities, habitats and landscapes.”*

Natural heritage: Nature, Special Areas

Low

High

**Ecological integrity**

**Public access**

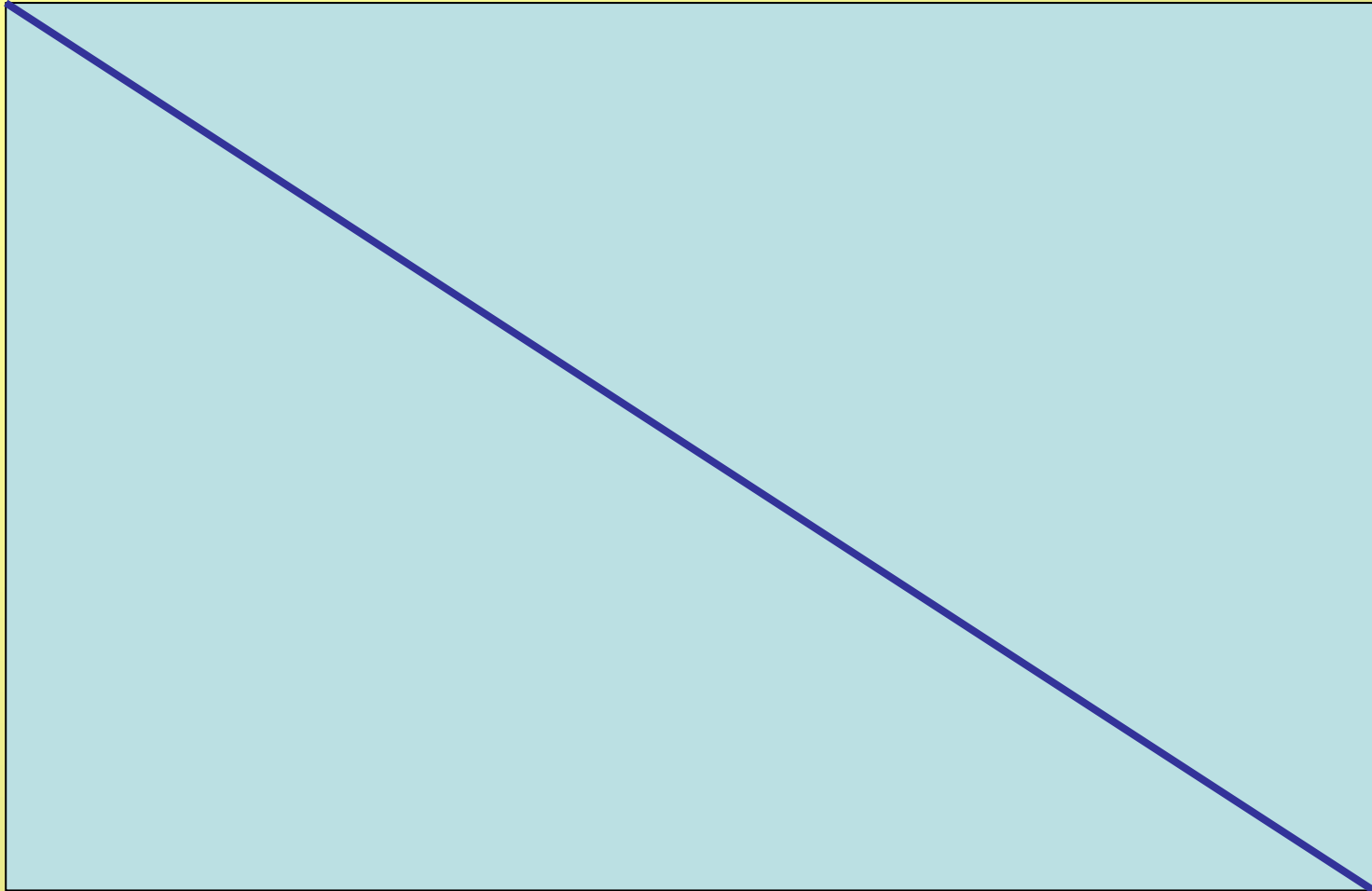
High

Low

Scenic, National Parks

Recreation

**Reserve goals**



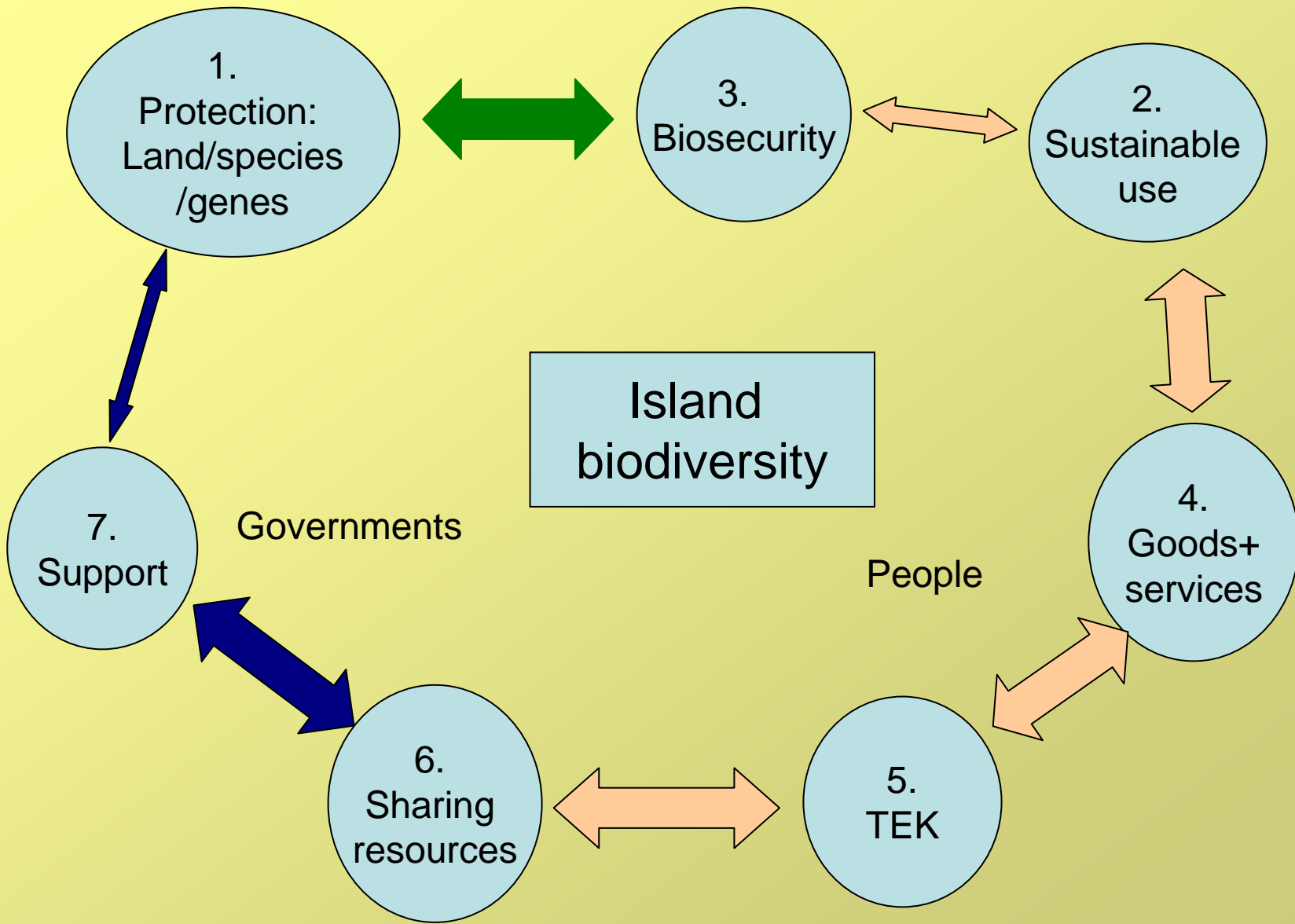
# Focus: ecological integrity

- Caters for nature heritage AND use
- Sliding scale high to low integrity reflects community aspirations
- Bundles multitude reserve types into 6 functional categories
- Defines attributes depending on levels of integrity
- Defines measures of success for each functional category

# **New Zealand as a case study**

How do New Zealand approaches and experience align with Island biodiversity program of work?

Resources

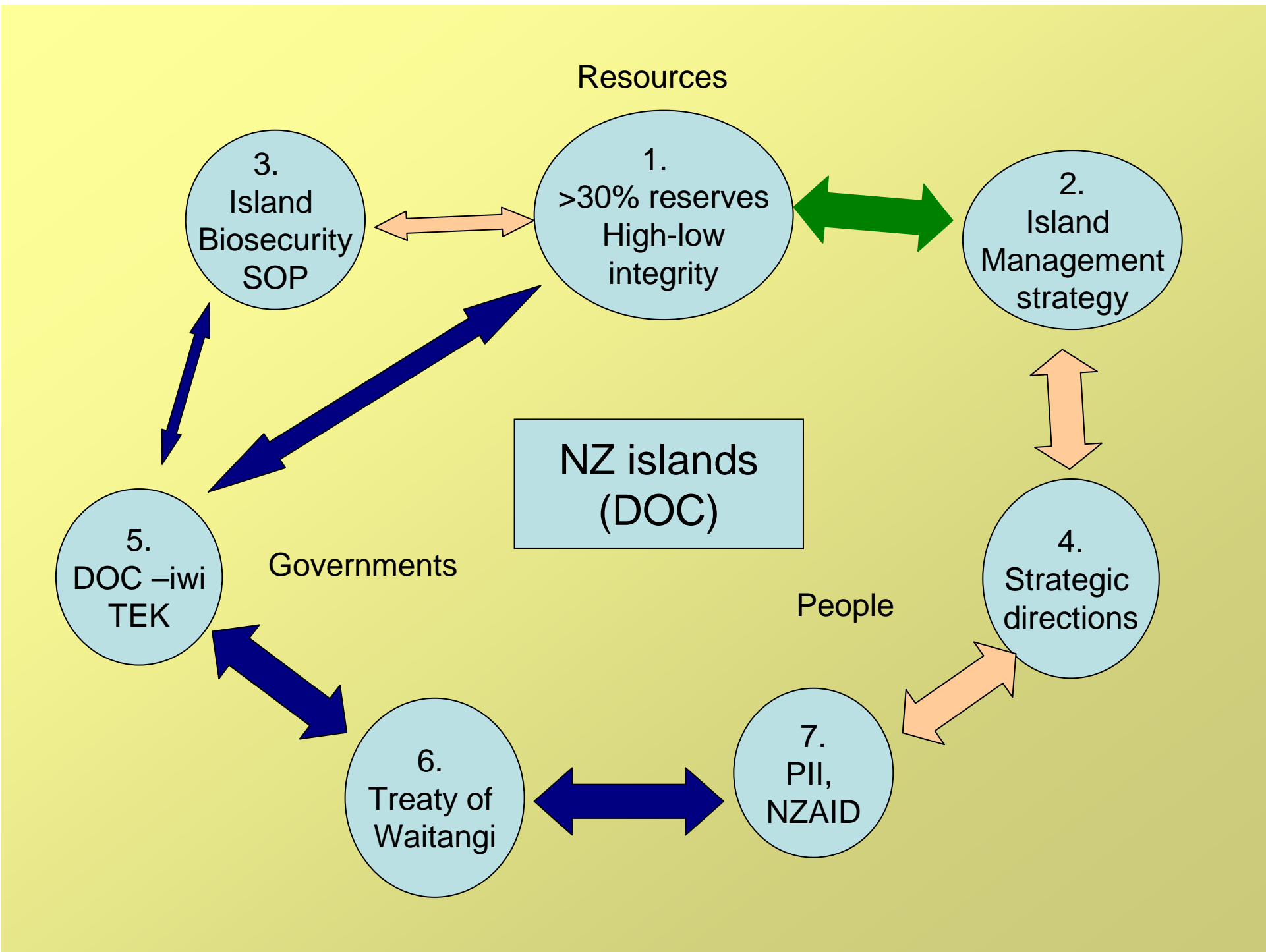


Island  
biodiversity

Governments

People





# Viwa Island mammal and cane toad eradication (60 ha)



# **New Zealand as case study**

- High levels of management achievement
- Most managed islands uninhabited
- Island management complicated by inherited ad hoc legislation
- Relationships with Maori defined in Treaty of Waitangi and claims process
- Private-public partnerships developing

# Challenges for NZ

- Settlement of Treaty of Waitangi claims
- Technical constraints overcome
- National island management strategy used
- Outcome measures developed for management with differing goals
- Rigorous reporting systems applied
- Large inhabited islands with resistant minorities managed effectively

# Challenges for CBD islands program?

Your call!