# Evaluating the impact of the 2016 earthquake on the population of Hutton’s shearwater

THE Hutton’s Shearwater CHARITABLE TRUST

# BACKGROUND

## The Hutton’s shearwater — Fact sheet

**IUCN Red List**: Endangered

**NZ Threat status:** Nationally vulnerable

**Taonga** – treasured species

**Endemic** to Kaikoura

**Nocturnal / Burrow breeder**

**1 chick / year**

**Migratory**

**Site fidelity**

**Arrival at colony:** August/September

**Egg laying:** October/November

**Hatching:** December

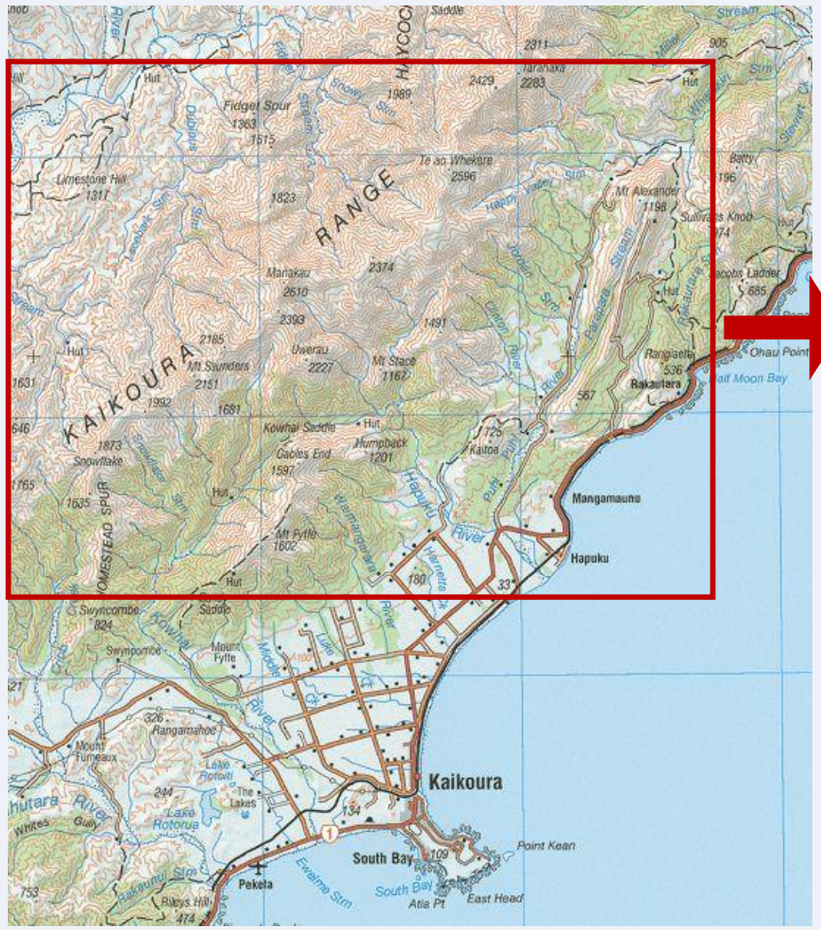
**Fledging:** March/April

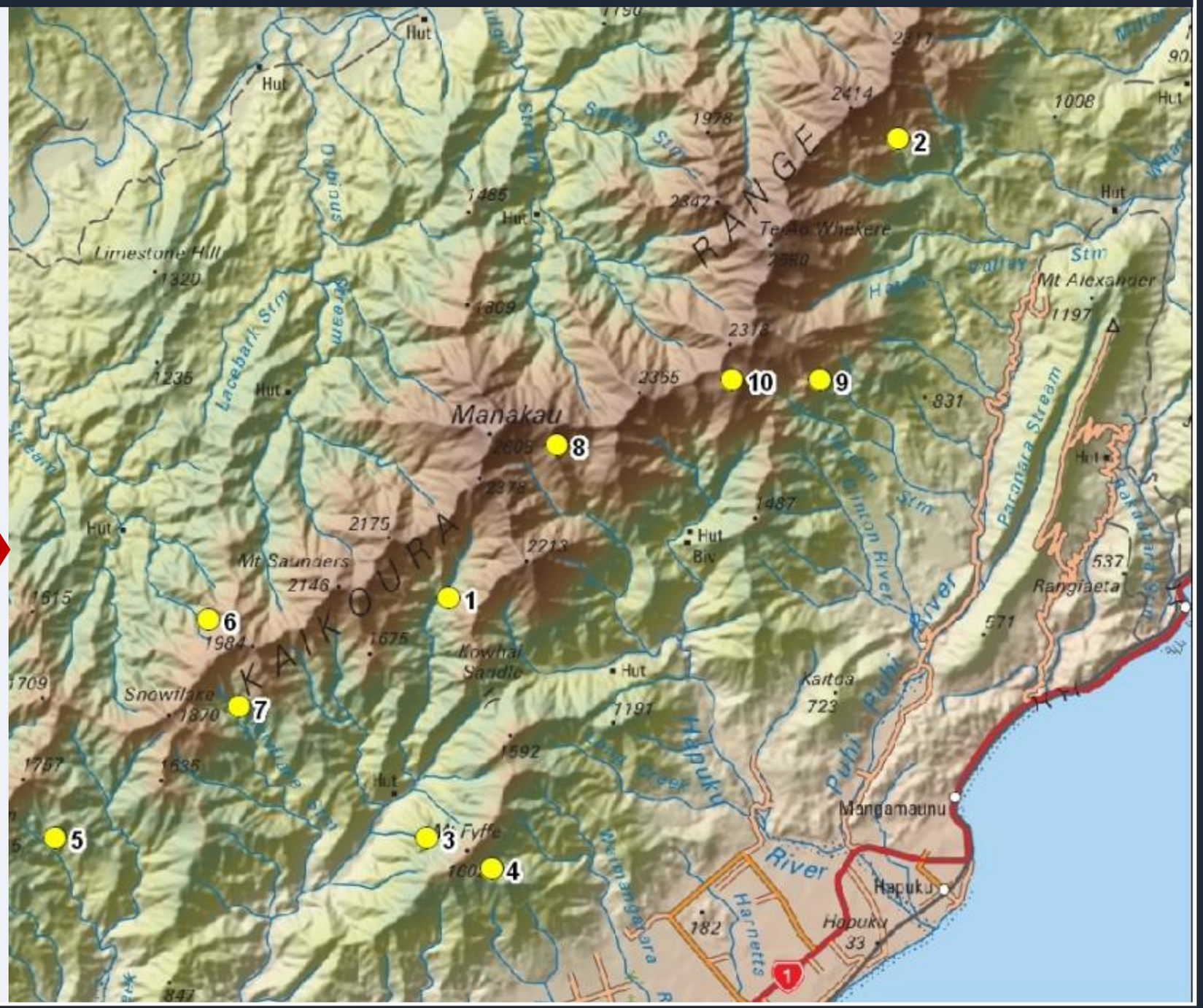
# BACKGROUND

## The Hutton’s shearwater — a seabird unique to Kaikoura

- **First described – 1912**

  **(10 colonies)**



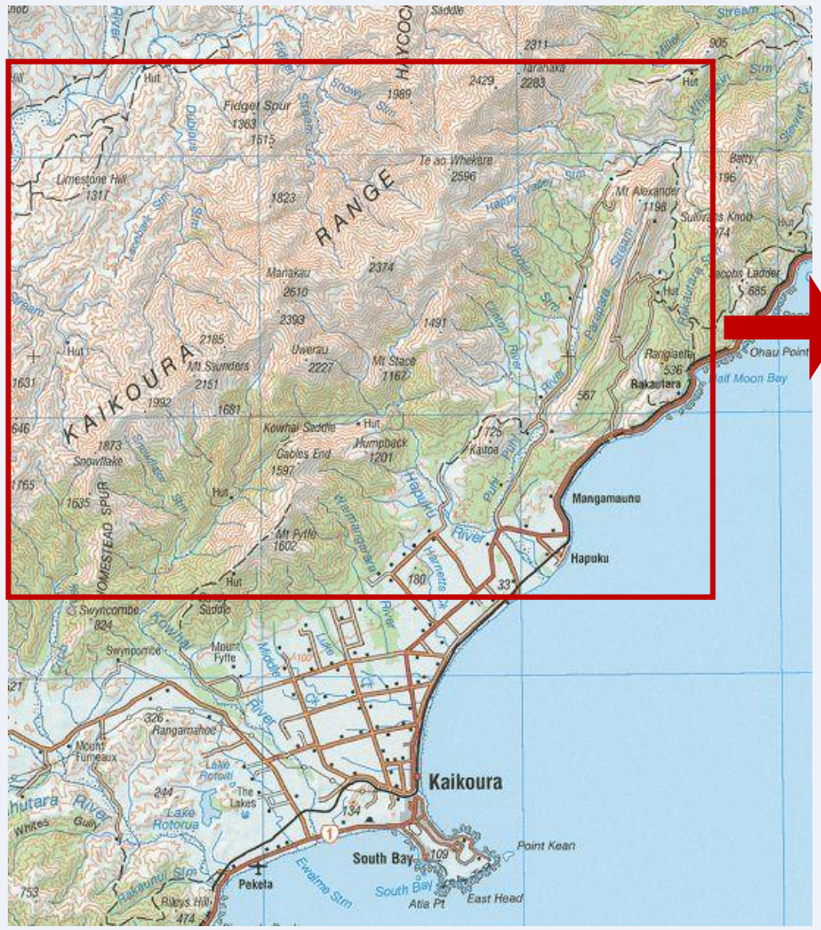
# BACKGROUND

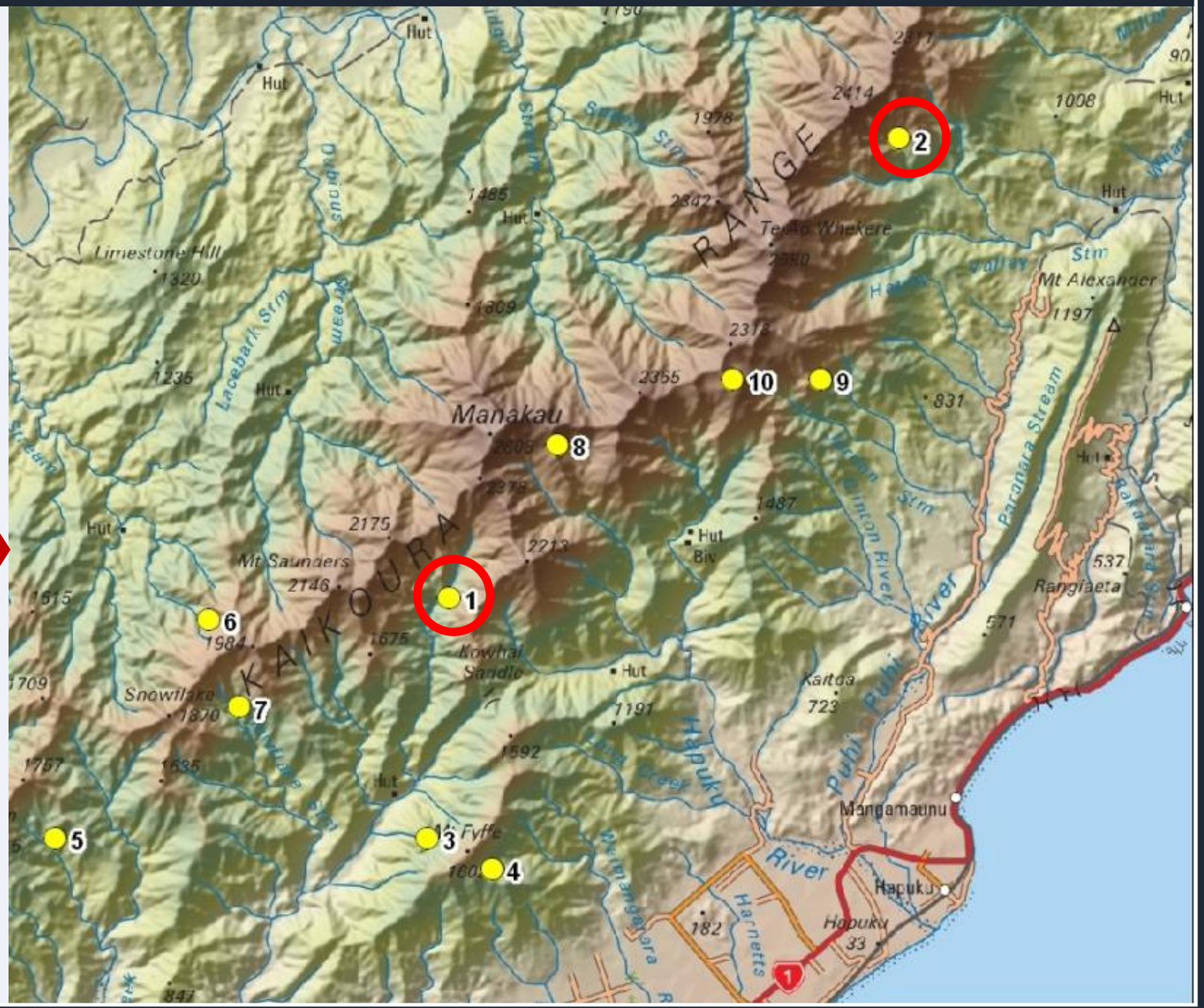
## The Hutton’s shearwater — a seabird unique to Kaikoura

- **Two colonies – to date**

  **1: Kowhai Valley (90% of pop)**

  **2: Shearwater Stream**



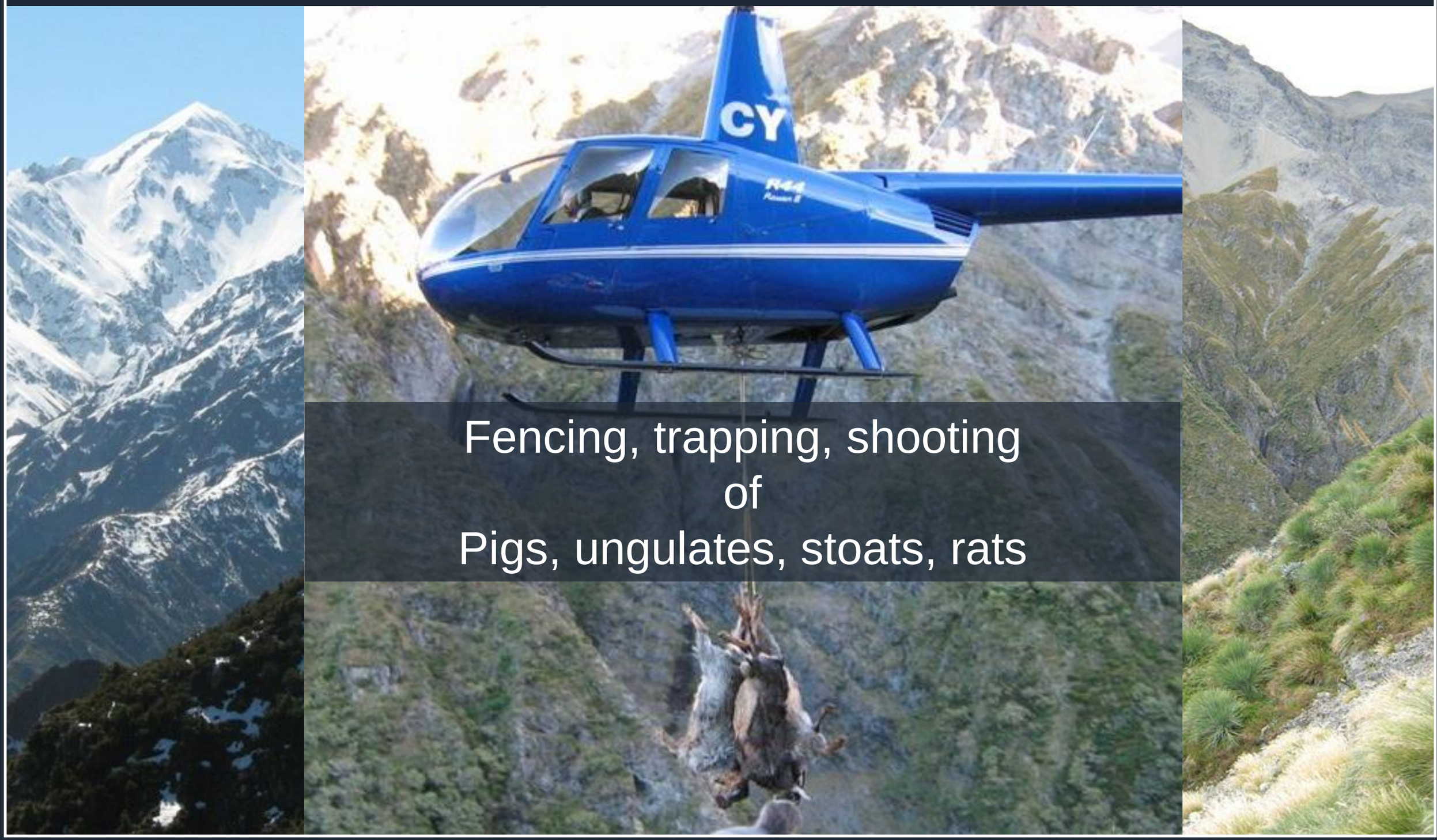
# BACKGROUND

## A shearwater retreat at >1200m asl

Recent range contraction of Hutton’s shearwater
mainly attributed to
predation and habitat destruction by feral pigs.

# BACKGROUND

## Predator control measures



# BACKGROUND

## Population monitoring

Population growth rate:

1.7%

# BACKGROUND

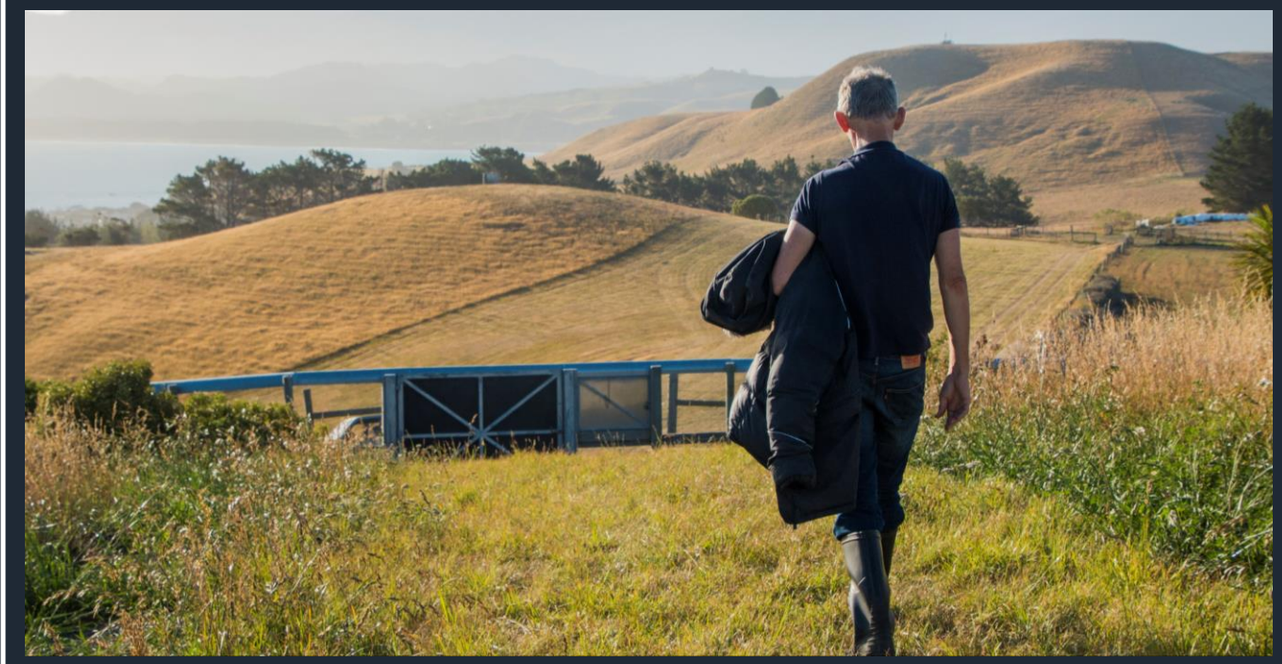
## Contingency measure — A new colony

Establishment of Te Rae o Atiu on Kaikoura Peninsula

Translocation of chicks into man-made burrows

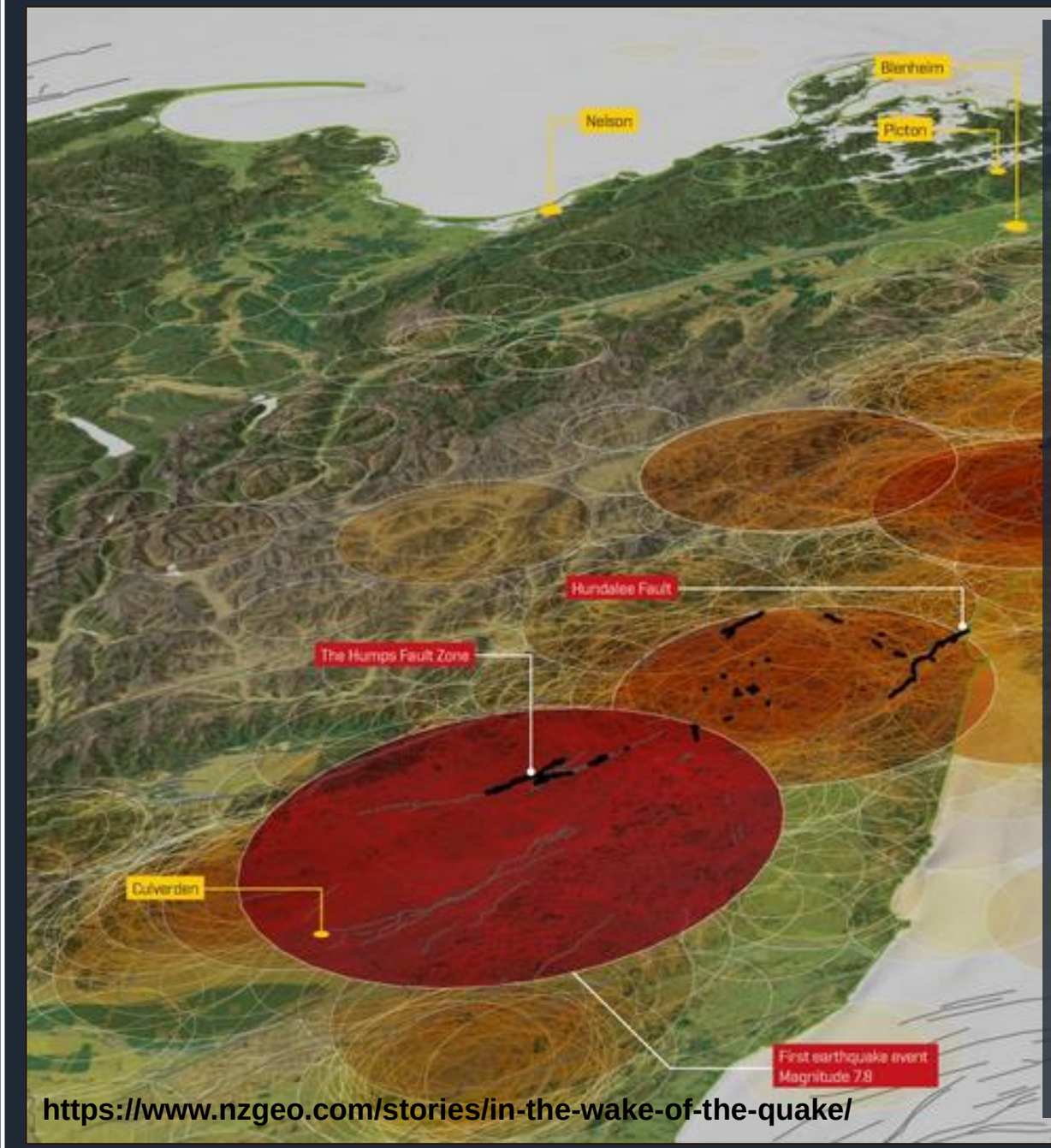
# BACKGROUND

## Contingency measure — A success!



Predator proof fencing ⇨ Birds returned to breed successfully;
25 breeding pairs to date

# Kaikoura Earthquake – 14 November 2016




https://www.nzgeo.com/stories/in-the-wake-of-the-quake/

The EQ struck when most birds would have been incubating an egg.

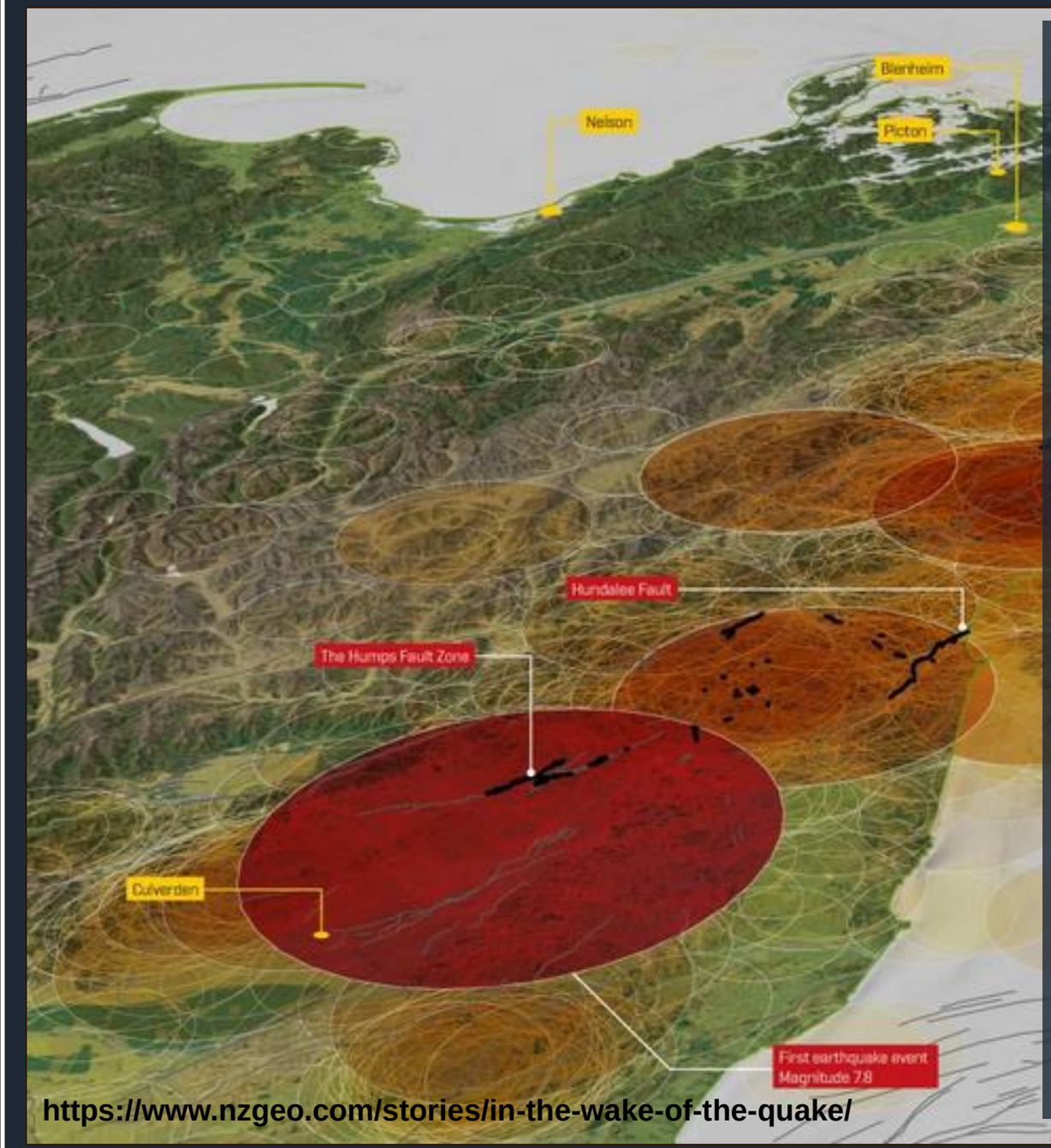
⇩

At least one breeding adult present in every occupied burrow.

⇩

Landslides and collapsing burrows likely to have caused severe loss of lives.

# Kaikoura Earthquake – 14 November 2016




https://www.nzgeo.com/stories/in-the-wake-of-the-quake/

The EQ struck when most birds would have been incubating an egg.

⇩

At least one breeding adult present in every occupied burrow.

⇩

Landslides and collapsing burrows likely to have caused severe loss of lives.

The HSCT has received funding from MPI to assess the magnitude of the impact.

# OBJECTIVES

- Conduct aerial surveys and revisit colonies to assess habitat loss, burrow collapse and number of remaining breeding pairs.
- Assess threat levels, e.g. altered risk of predation or other limitations to recovery.
- Assess total population numbers & magnitude of population effects.
- Assess alternative breeding sites to build up future capacity.

# RESULTS

## Bad news:

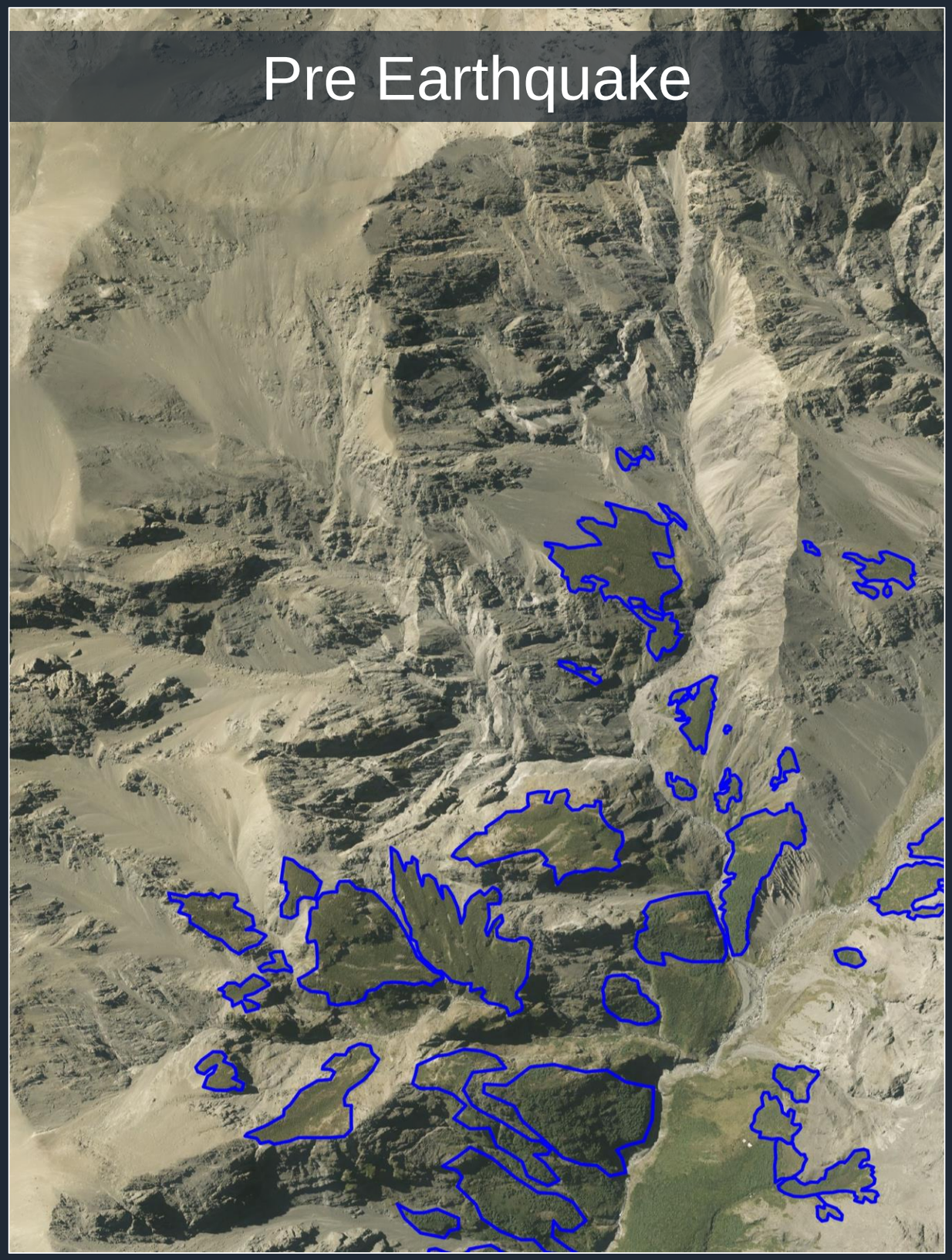
- Mountain colonies have sustained major damage:
  - 12% loss of breeding habitat
  - 33% reduction in burrow density
  - 39% decline in breeding numbers
- Shearwater Stream inaccessible; no on-the-ground assessment possible.

## Good news:

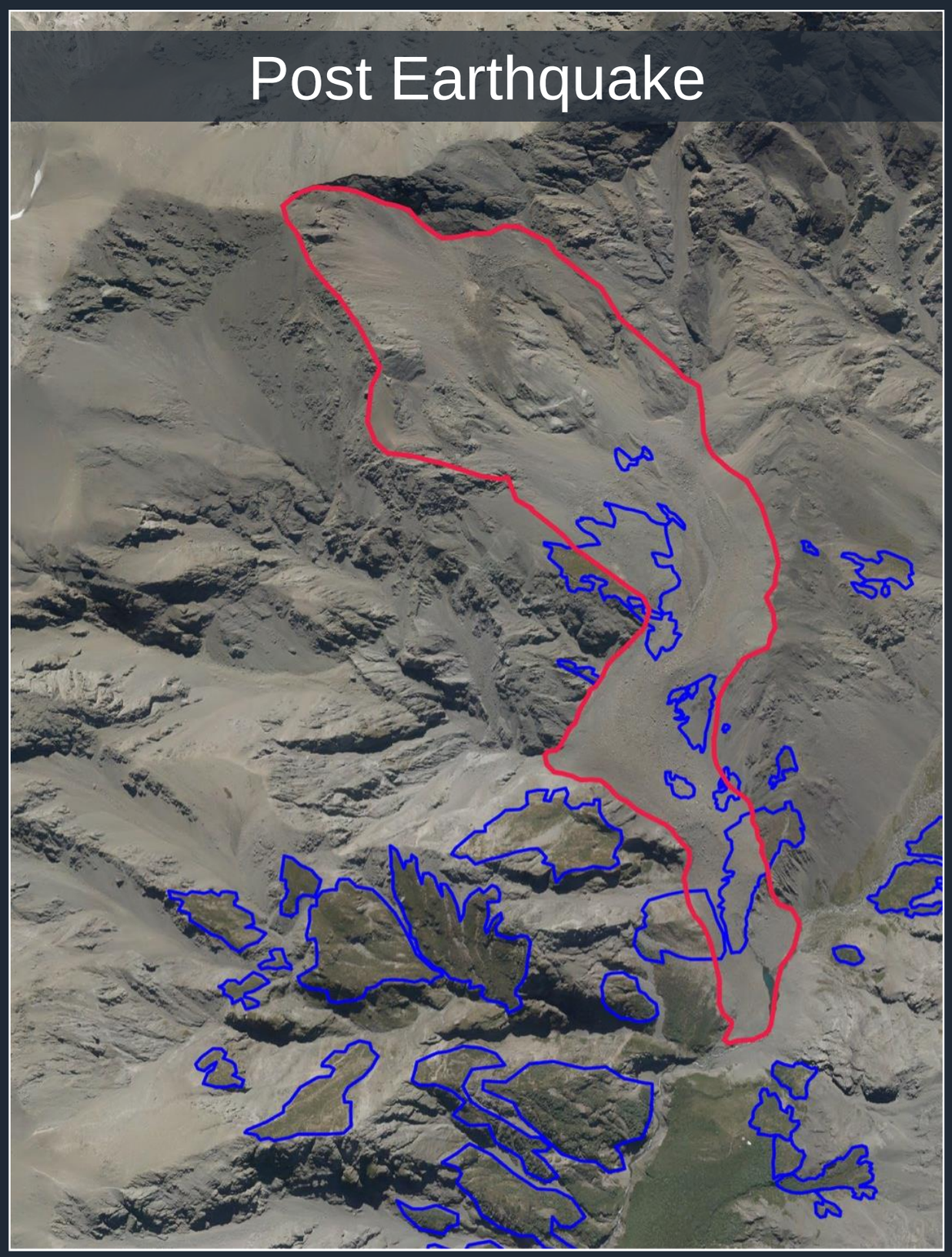
- Peninsula colony unharmed; no loss of life / burrows intact.
- No altered accessibility to feral pigs.
- Signs of recovery in Kowhai Valley:
  - Sustainable number of breeding birds left.
  - Colony full of life and digging activity.

# Loss of breeding habitat due to landslides

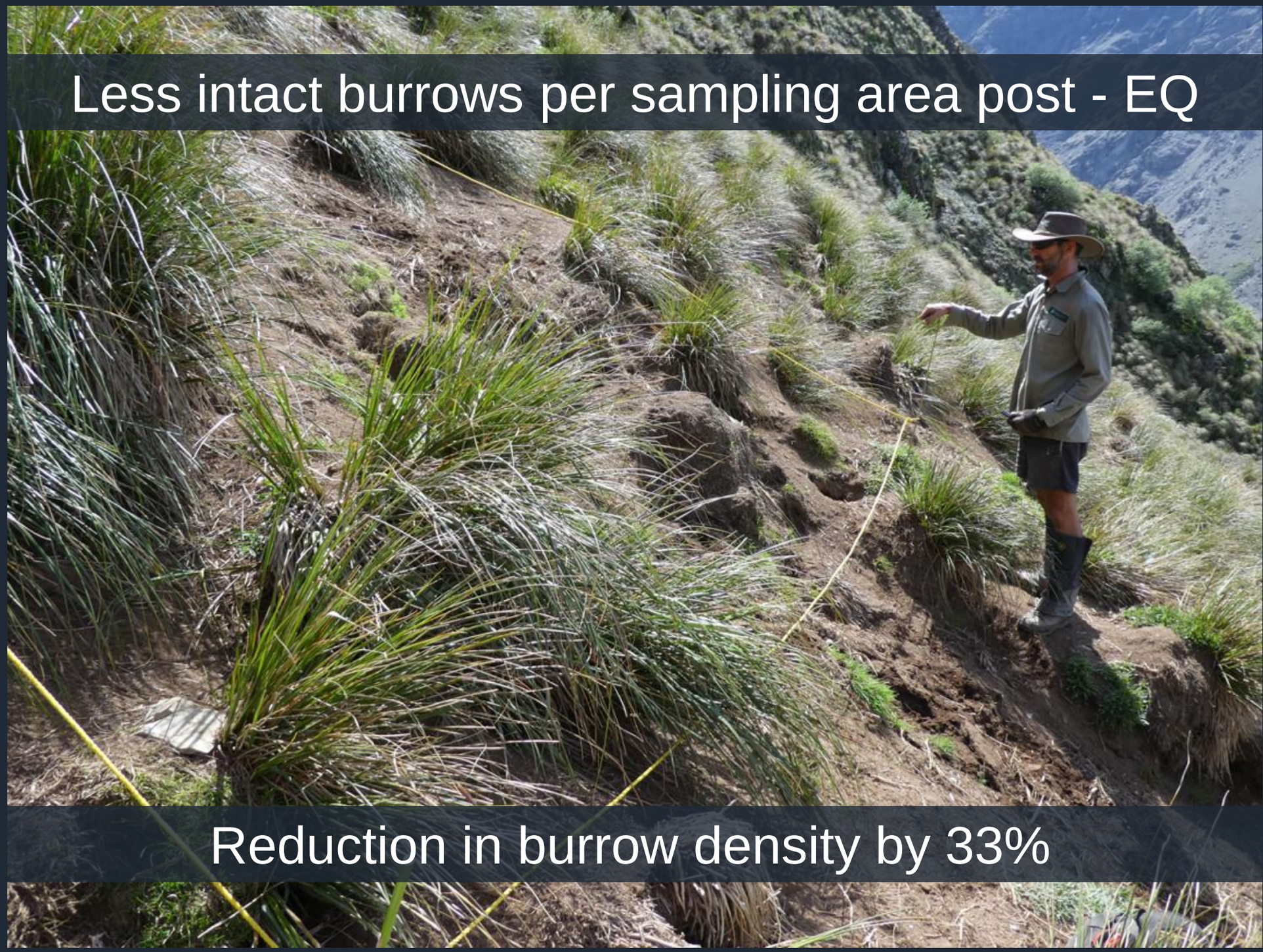
## Pre Earthquake



## Post Earthquake



# Loss of burrows (Kowhai Valley)



# Breeding population estimates

Population numbers given in breeding pairs (bp)

Breeding pair = reproductive unit

Total breeding area
x
average burrow density
x
average burrow occupancy

} No. of breeding pairs

# A prelude on the new breeding population numbers…

Use of now advanced technology in assessing breeding habitat area revealed:

⇒ **Area size was previously underestimated**.

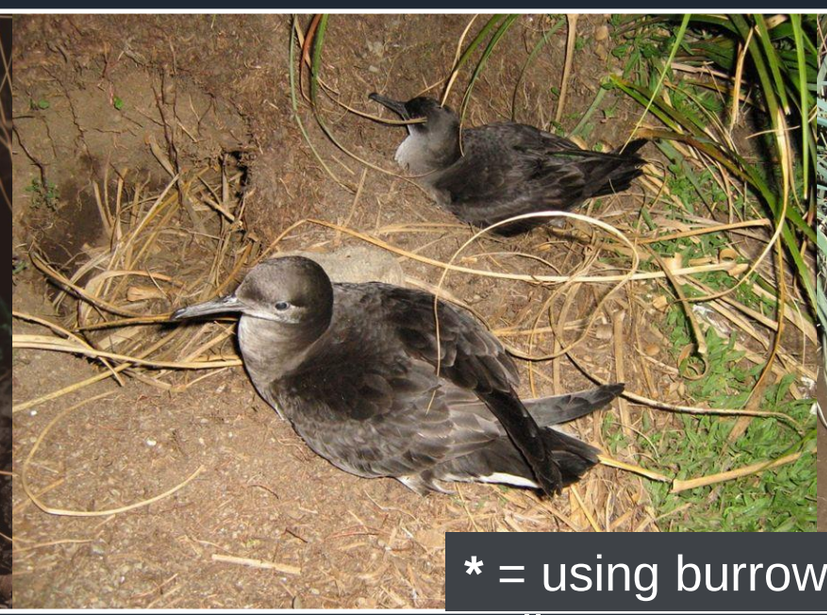
Estimate of breeding numbers is area dependent:

⇒ Larger area = higher bp estimates

Resulting in **revised pre – EQ breeding population estimates**.

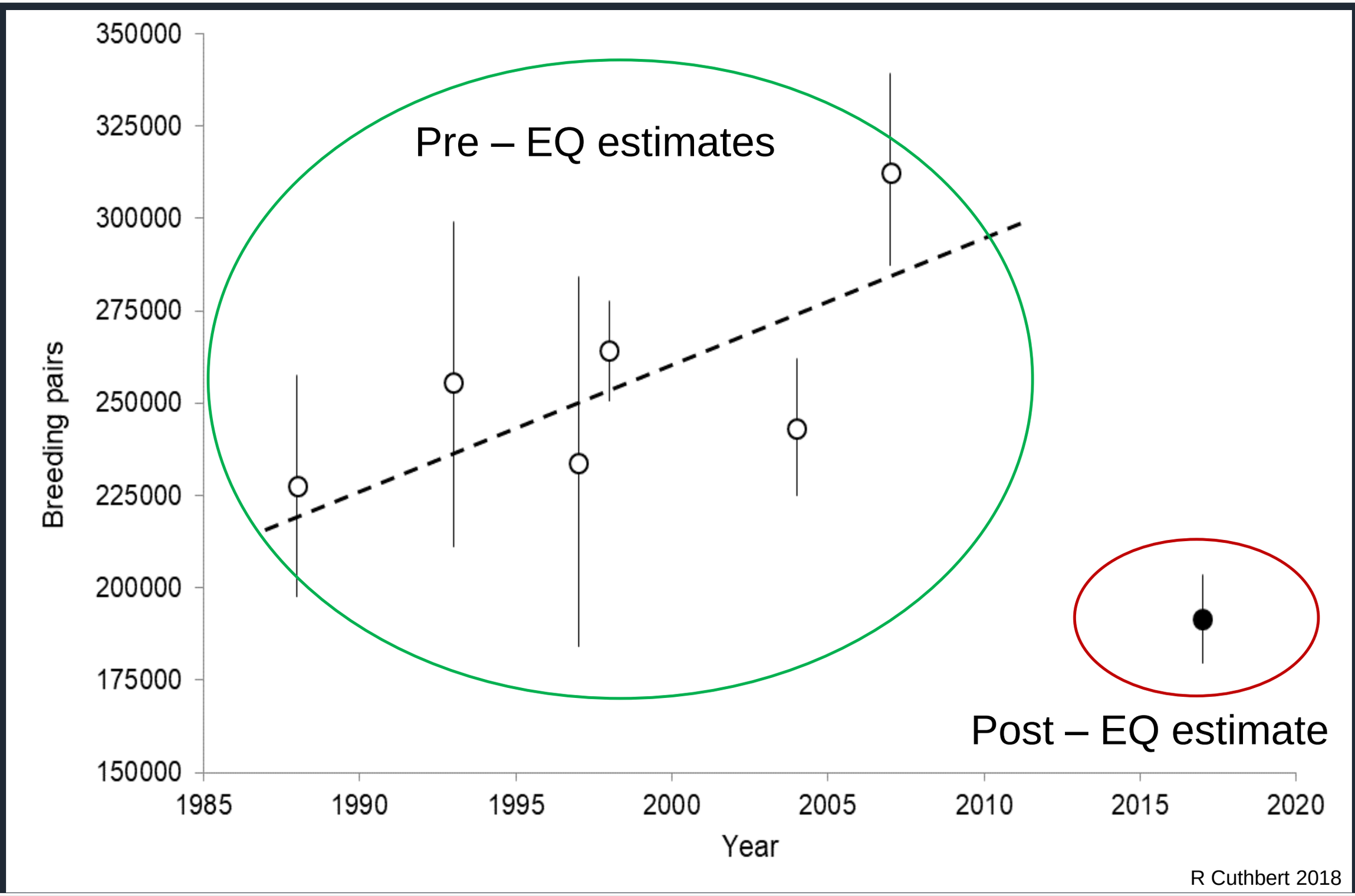
# Breeding Population Estimate Results

| Number of breeding pairs | | |
|---|---|---|
| Colony | Pre – EQ (new) | Post - EQ |
| Kowhai Valley | 295,000 | 180,000 |
| Shearwater Stream | 17,600 | 11,600* |
| **Total** | **312,000** | **192,000** |

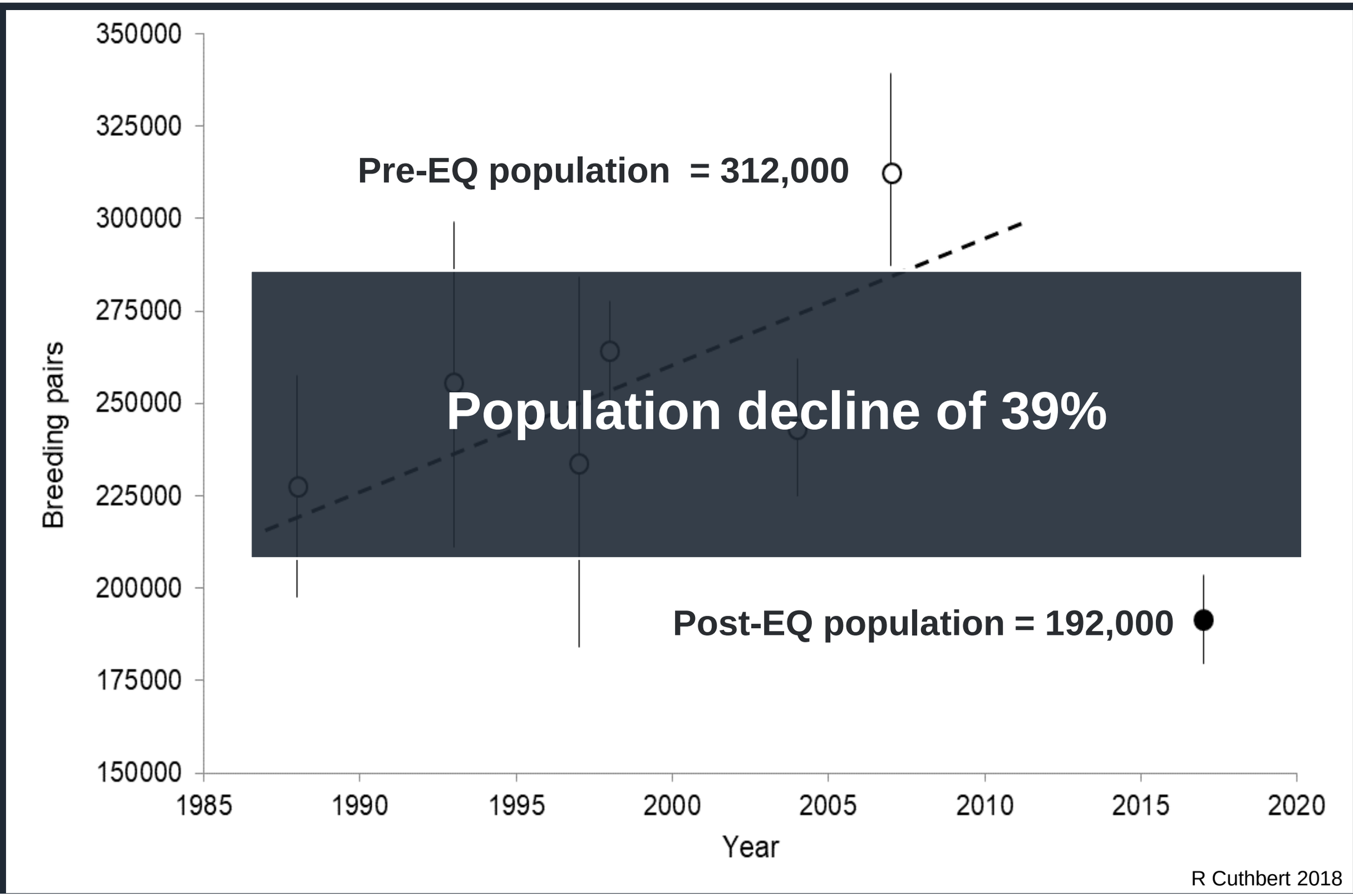


***** = using burrow density estimates from Kowhai Valley

# Estimated breeding population size of Hutton's shearwater pre- and post- EQ



# Estimated breeding population size of Hutton's shearwater pre- and post- EQ



# Total population estimates

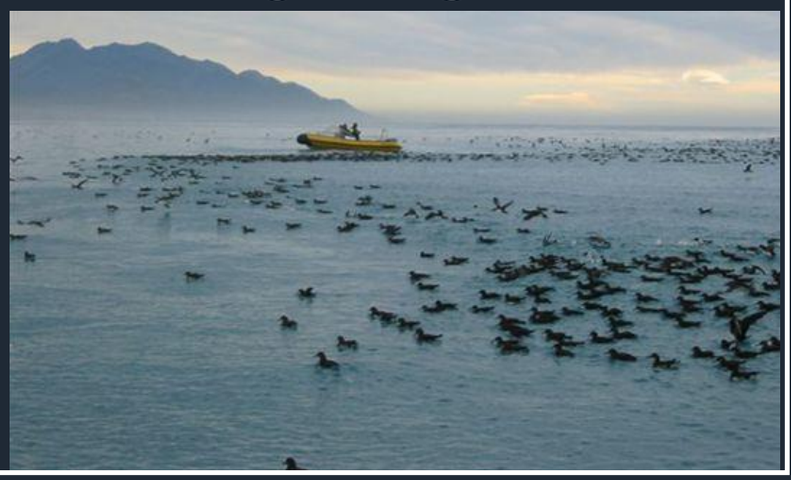
Assessment of no. of individual birds

(incl.  breeders and non-breeders)

Methodology used: Mark-Recapture

Colour marking at colony

Re-sighting at sea



# Total population estimates

Assessment of no. of individual birds

(incl.  breeders and non-breeders)

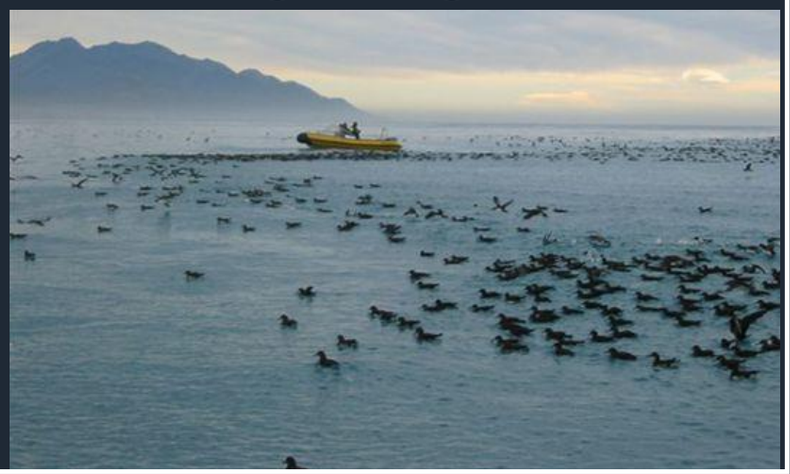
Methodology used: Mark-Recapture

Colour marking at colony

Snow cover allowing for easy capture

Due September 2018

Re-sighting at sea



# Total population estimates

Assessment of no. of individual birds

(incl.  breeders and non-breeders)

Methodology used: Mark-Recapture

Colour marking at colony

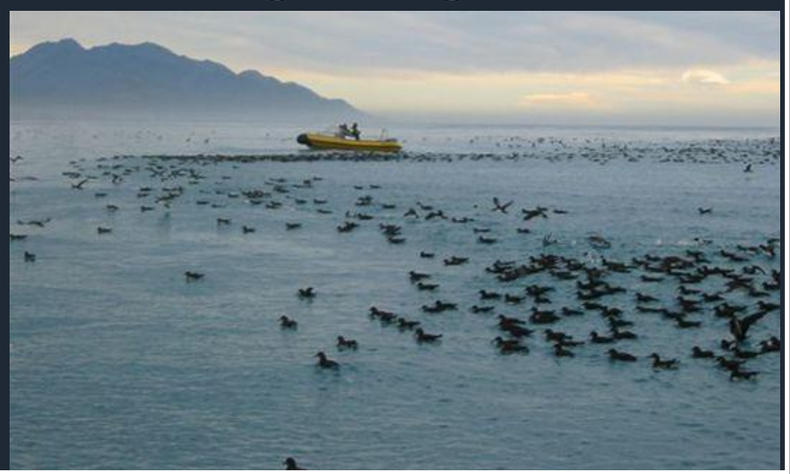
**2002:**

450,000 birds

**2014:**

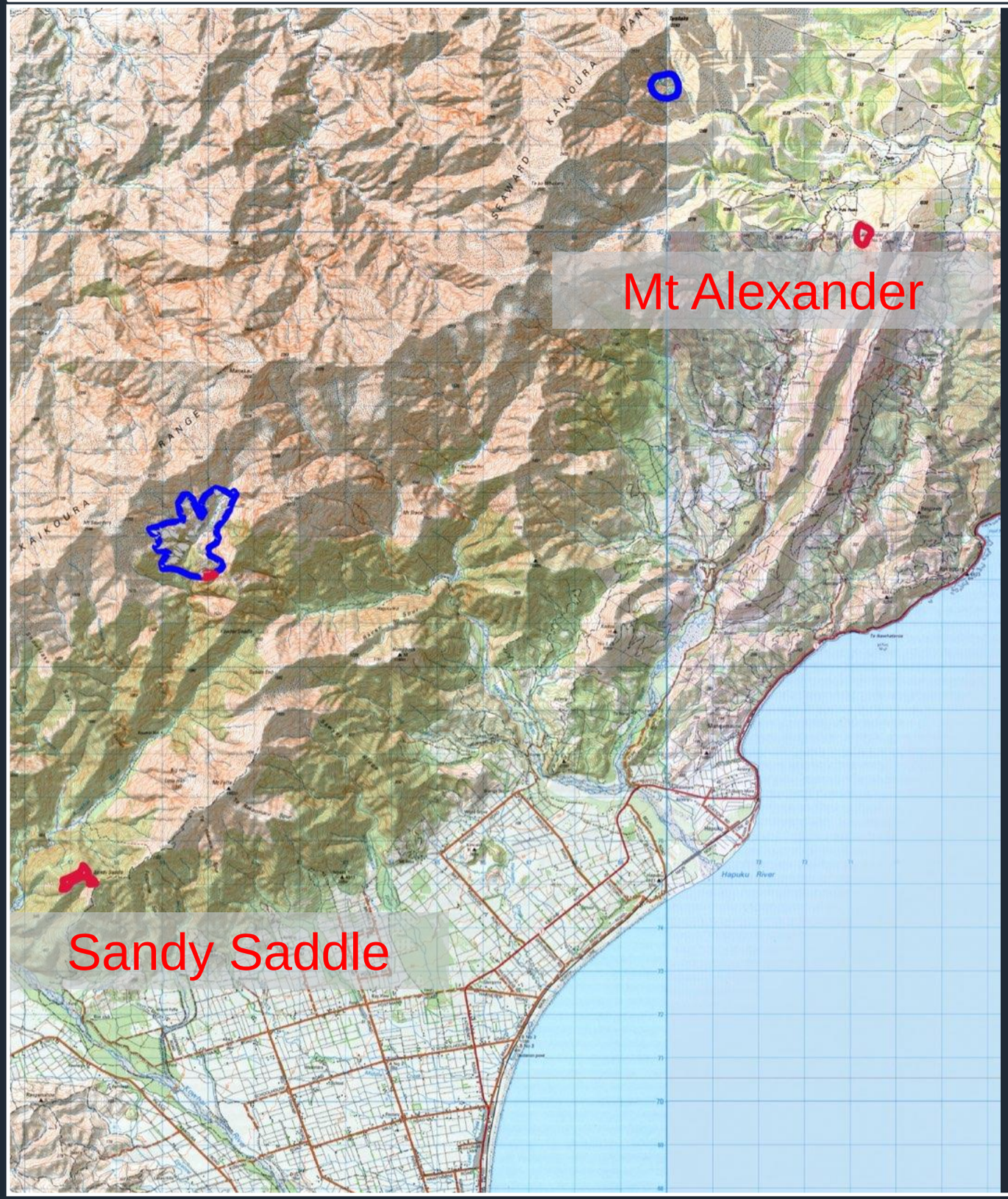
600,000 birds

Re-sighting at sea



# Contingency measures (revisited)

## Potential for the establishment of new colonies in the future?




# ACKNOWLEDGEMENTS

**WE ARE SO GRATEFUL**

# ACKNOWLEDGEMENTS


**Lindsay Rowe** (conception)

**Richard Cuthbert** (research)

**John Preece** (project management)

**Puhi Peaks Station** (area access)

**DOC** (research facilitation)

**Kaikoura helicopters** (logistics)

**MPI** (funding)