

# **POP2015/01: Black petrel (*Procellaria parkinsoni*) population project FINAL RESULTS**

**ELIZABETH BELL, CLAUDIA MISCHLER & NIKKI MCARTHUR**

Wildlife Management International Limited, PO Box 607, Blenheim 7240, New Zealand,  
biz@wmil.co.nz

Presentation of results from black petrel 2015/16 breeding season  
to the Department of Conservation CSP Technical Working Group

22 September 2016

# OBJECTIVES:

- To estimate the population trend, fecundity and age-class survival of black petrels at Great Barrier Island (Aotea) and Te Hauturu-o-Toi/Little Barrier Island and to identify the presence of black petrels on the Moehau range using automated acoustic recorders



# AIMS (GBI):

## GREAT BARRIER ISLAND/AOTEA (GBI):

- Surveys of potential black petrel habitat using various techniques
- Collection of detailed capture/mark/recapture information from the long-term study burrows
- Complete additional tracking and dive depth work
- Population trend analysis on the long-term data and breeding status and success data from the long-term study burrows





# METHODS (GBI):

## Population:

- Using long-term study burrows
  - Mark-recapture of adults at the colony
  - Determine breeding success (and causes of failures)
  - Estimate population (and determine trends) at Hirakimata colony

## Surveys:

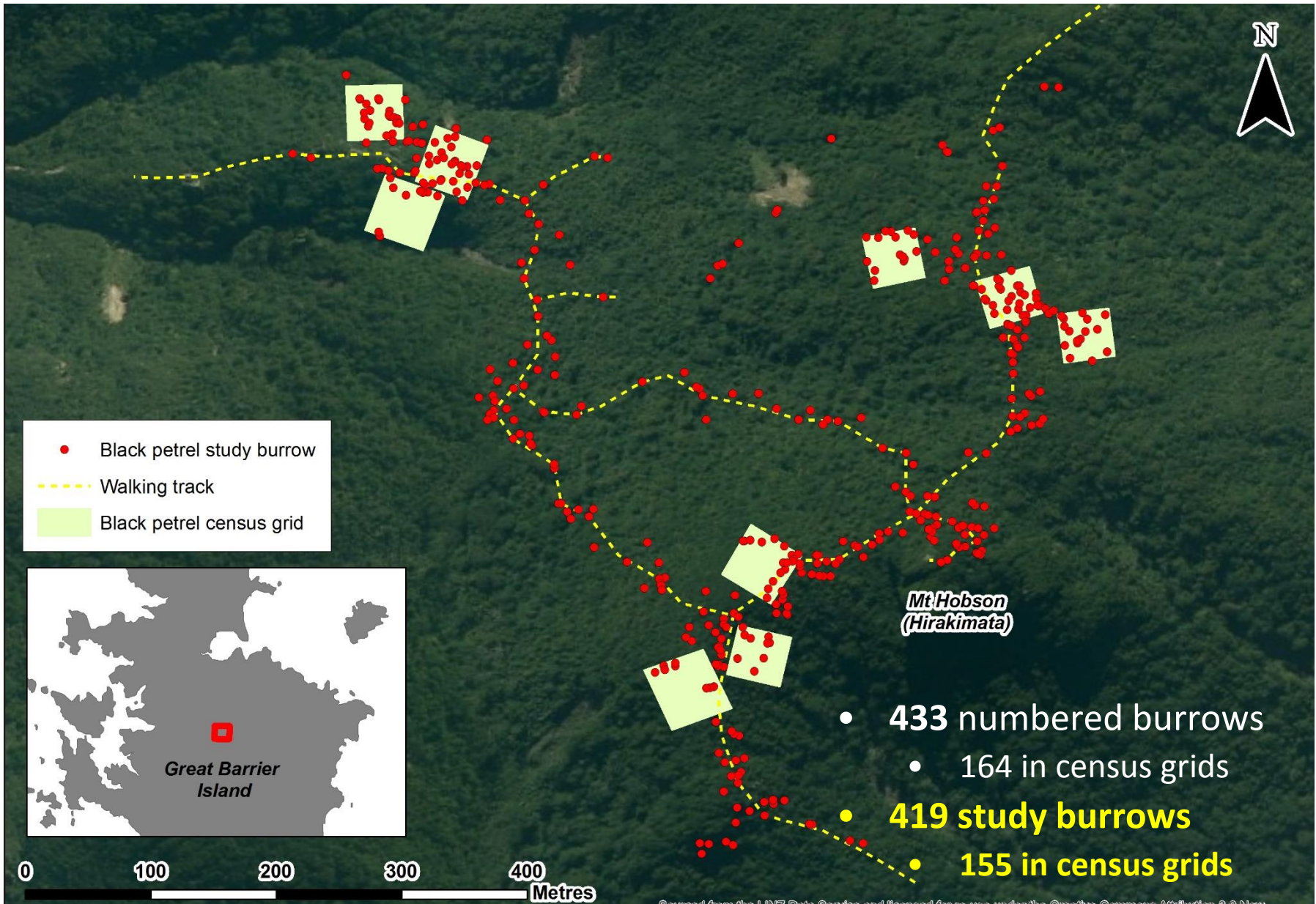
- Other areas using seabird detector dogs
- Using acoustic recorders
  - At colony (for density baseline)
  - At other locations (for presence/absences and comparison)

## Tracking:

- GPS and TDR devices
  - All devices failed



# STUDY SITE (GBI):



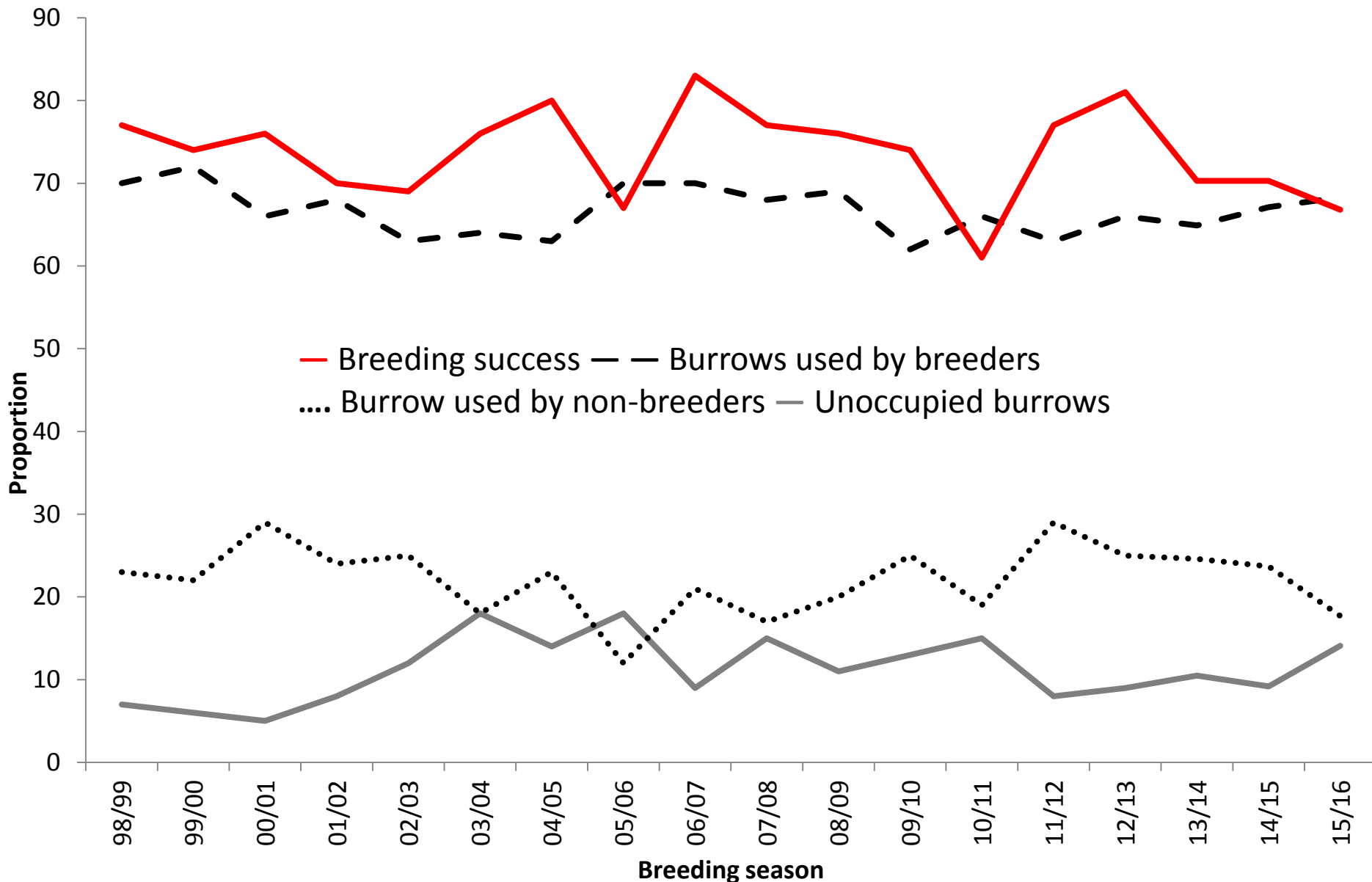


# RESULTS (GBI):

- 419 study burrows:
  - 286 breeding burrows
    - 95 failures (including rat predation 1%, crushed eggs 8%, abandoned eggs 2.5%, infertile eggs 0.3%, dead embryo 4%, disappeared egg 13 %, dead chick 0.7% and disappeared chicks 4%)
  - 75 non-breeding burrows
  - 59 unoccupied burrows
- Number of study burrows used for breeding per year varies from 62-72%
  - **2015/16 = 68.3% (mean = 66.7%)**
- Breeding success (chicks fledged from eggs laid) varies from 61-83% per year
  - **2015/16 = 66.8% (mean = 73.5%)**



# RESULTS (GBI) continued:



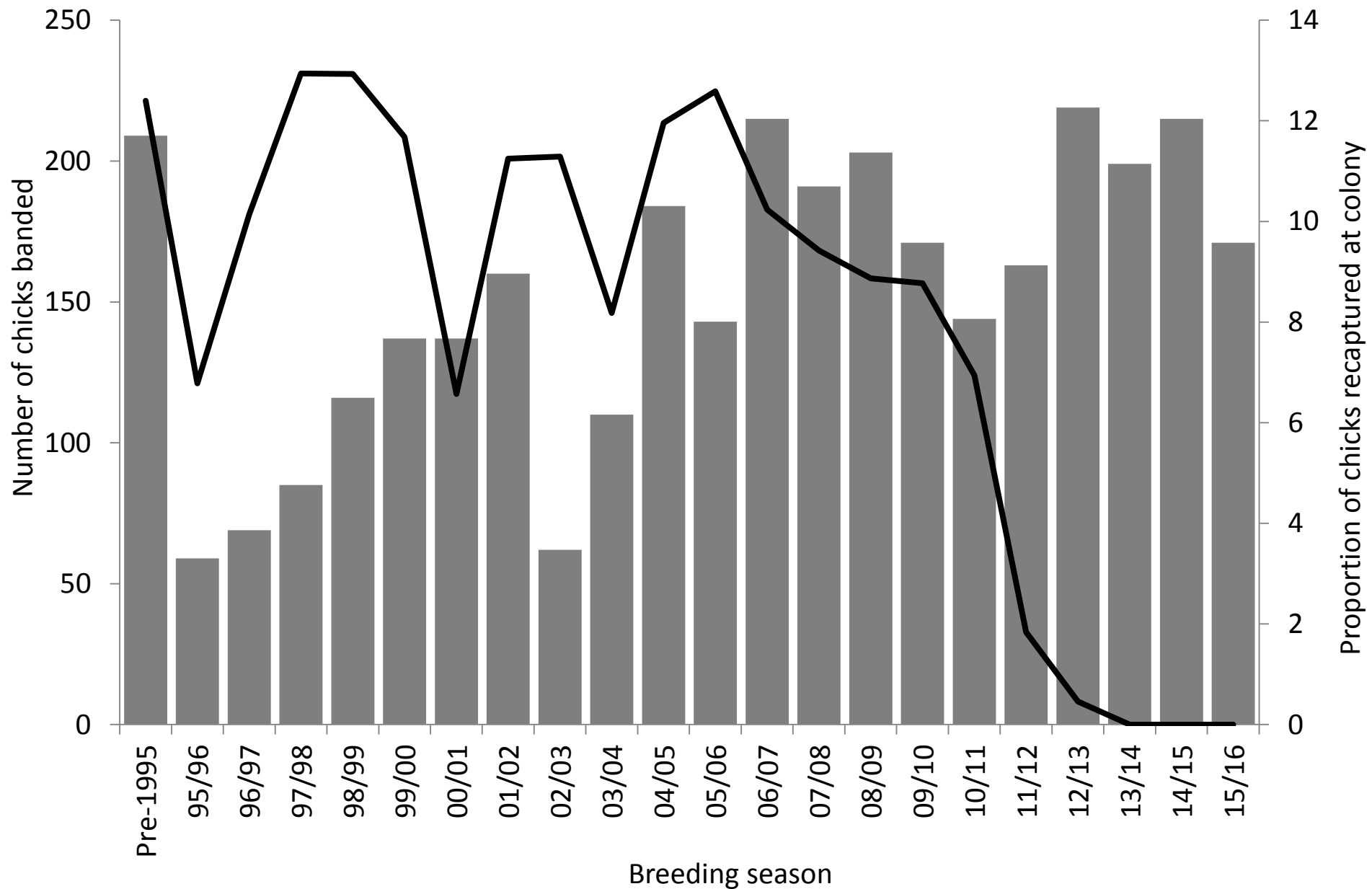
# RESULTS (GBI) continued:

- **771 adults and 185 chicks this season**
- 2788 adults banded
  - 2529 between 1995-2016
- 3758 banded as chicks
  - 3362 between 1995-2016
- **108 'returned chicks' this season**
  - 72 breeding (45 successfully)
- 249 'returned chicks' recaptured at the colony
  - 223 banded between 1995-2016
- **Earliest first return is 2 years [mean  $6.2 \pm 0.2$ ]**
- **Earliest first breeding is 4 years [mean  $7.5 \pm 0.2$ ]**
- **Earliest first successful breeding is also 4 years [mean  $7.9 \pm 0.3$ ]**





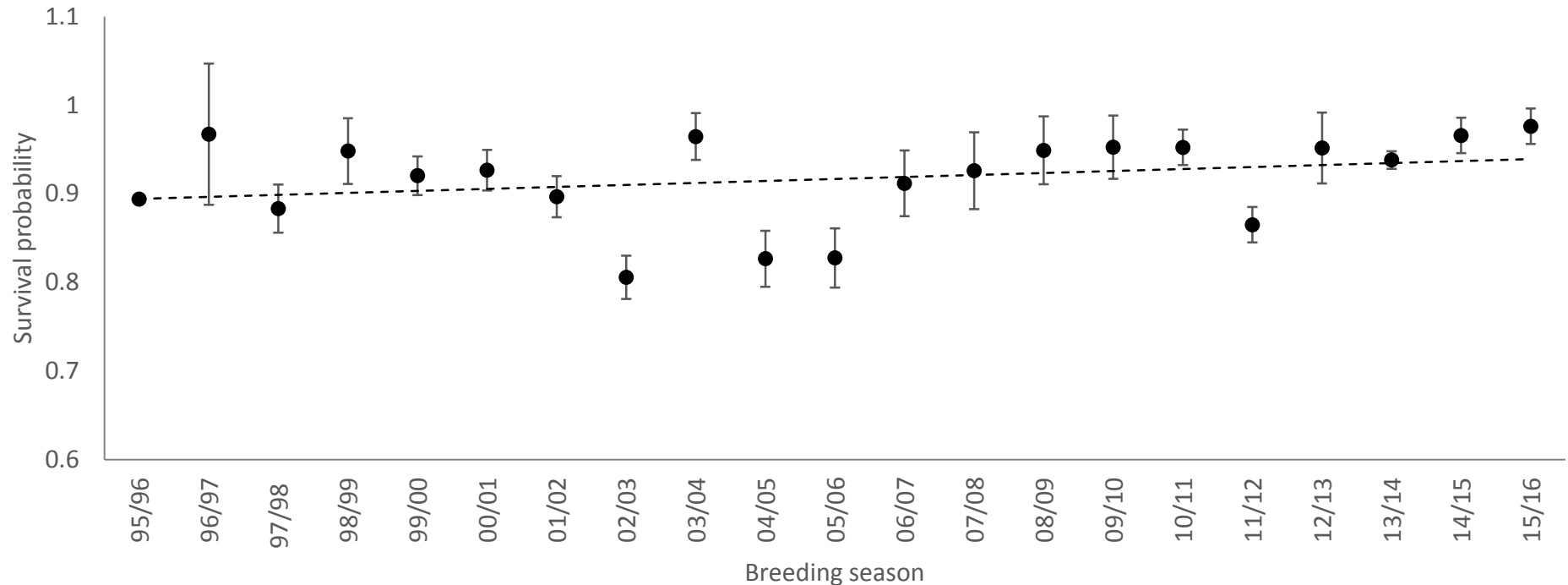
# RESULTS (GBI) continued:



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- **Adult survival =  $97.6 \pm 2$**
- **Site fidelity =  $86.9 \pm 2$**
- **Probability of adult recapture =  $61.8 \pm 1$**
- **Dead bird reportability =  $1.1 \pm 0.4$**



# RESULTS (GBI) continued:

- Chick survival =  $89.1 \pm 2$
- Probability of chick recapture =  $8.5 \pm 0.6$



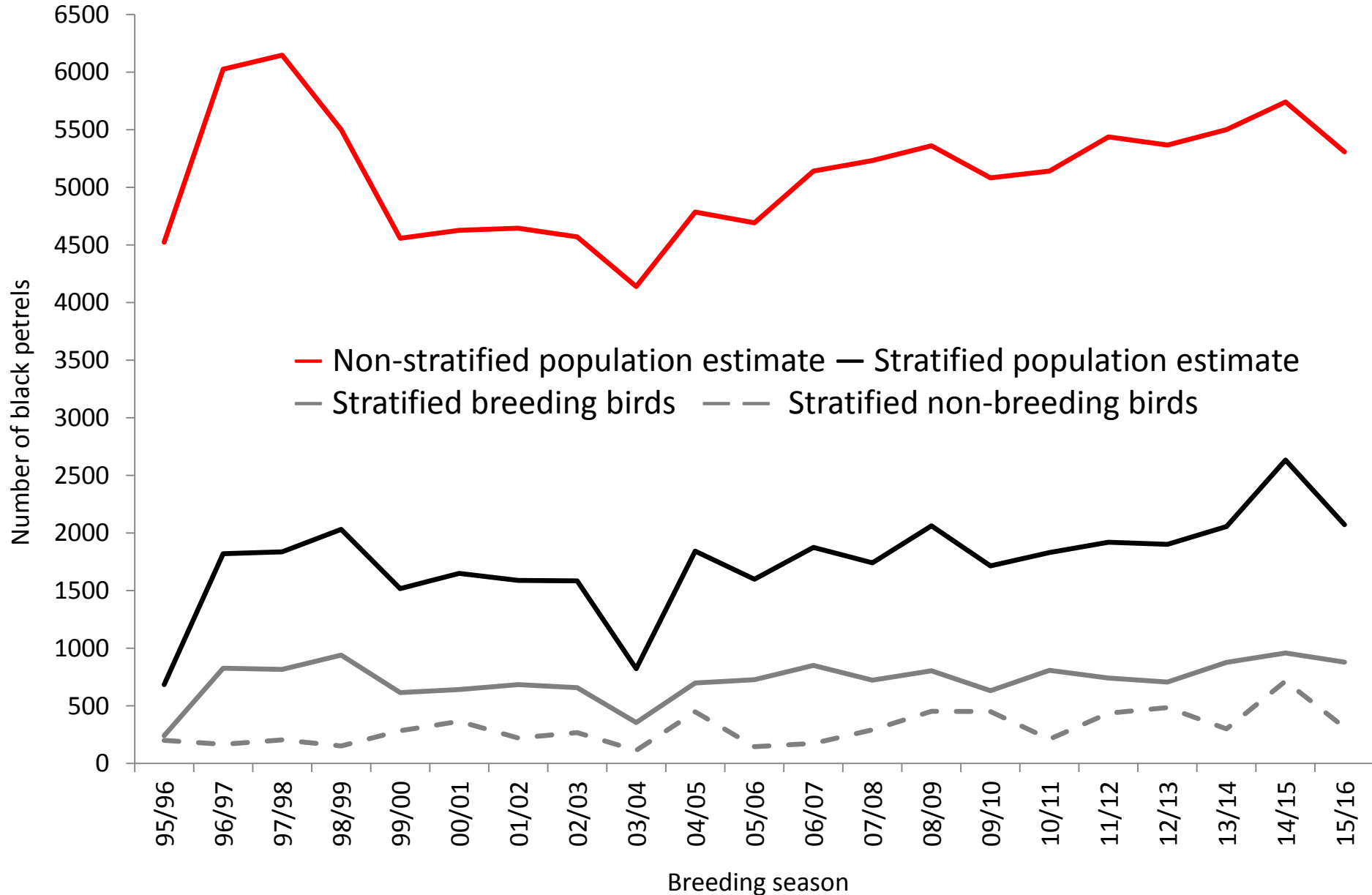


# RESULTS (GBI) continued:

- **Population estimate = 2072  $\pm$  125 birds**
  - 1947-2197 adults
  - 312  $\pm$  57 non-breeding birds
  - 1760  $\pm$  193 non-breeding birds

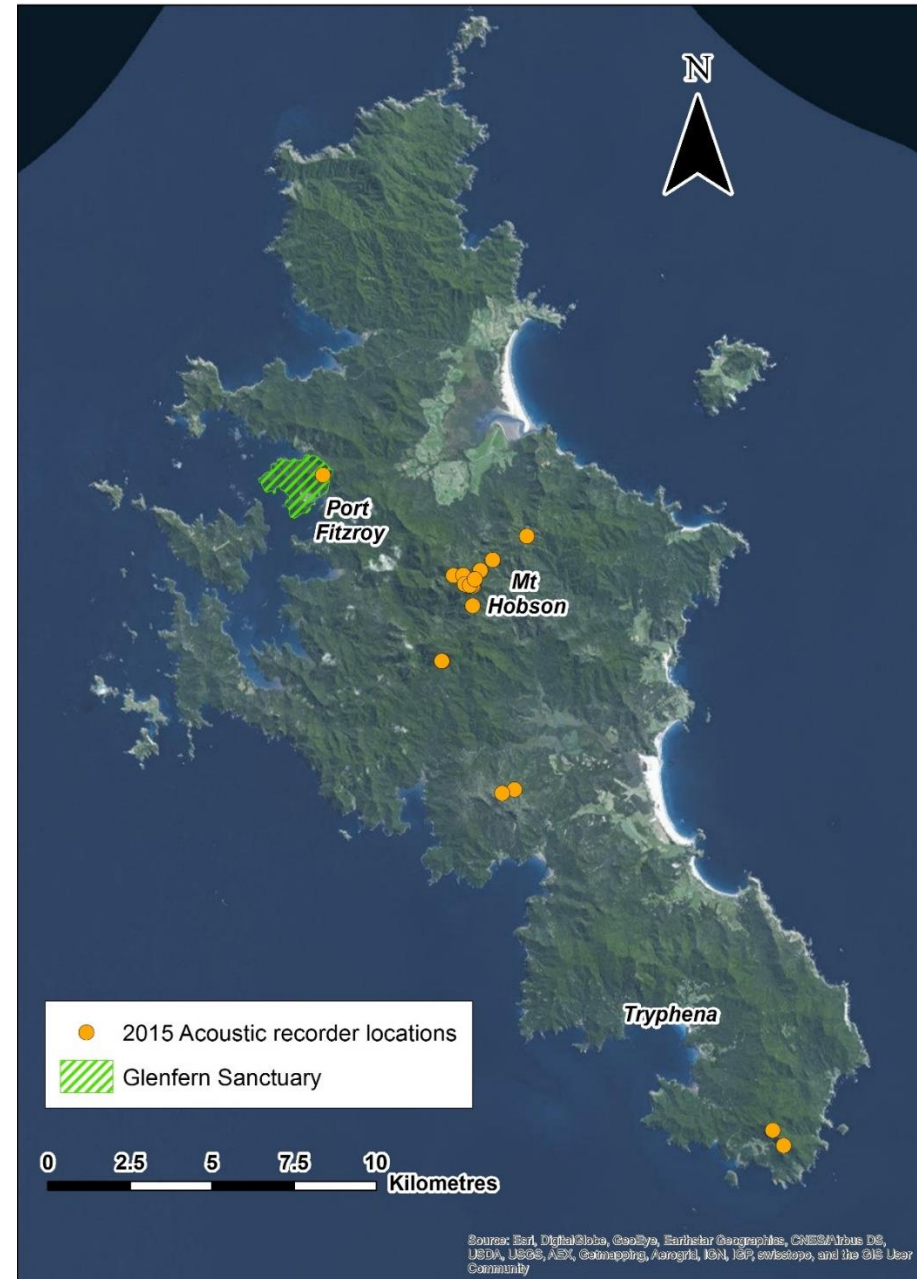


# RESULTS (GBI) continued:



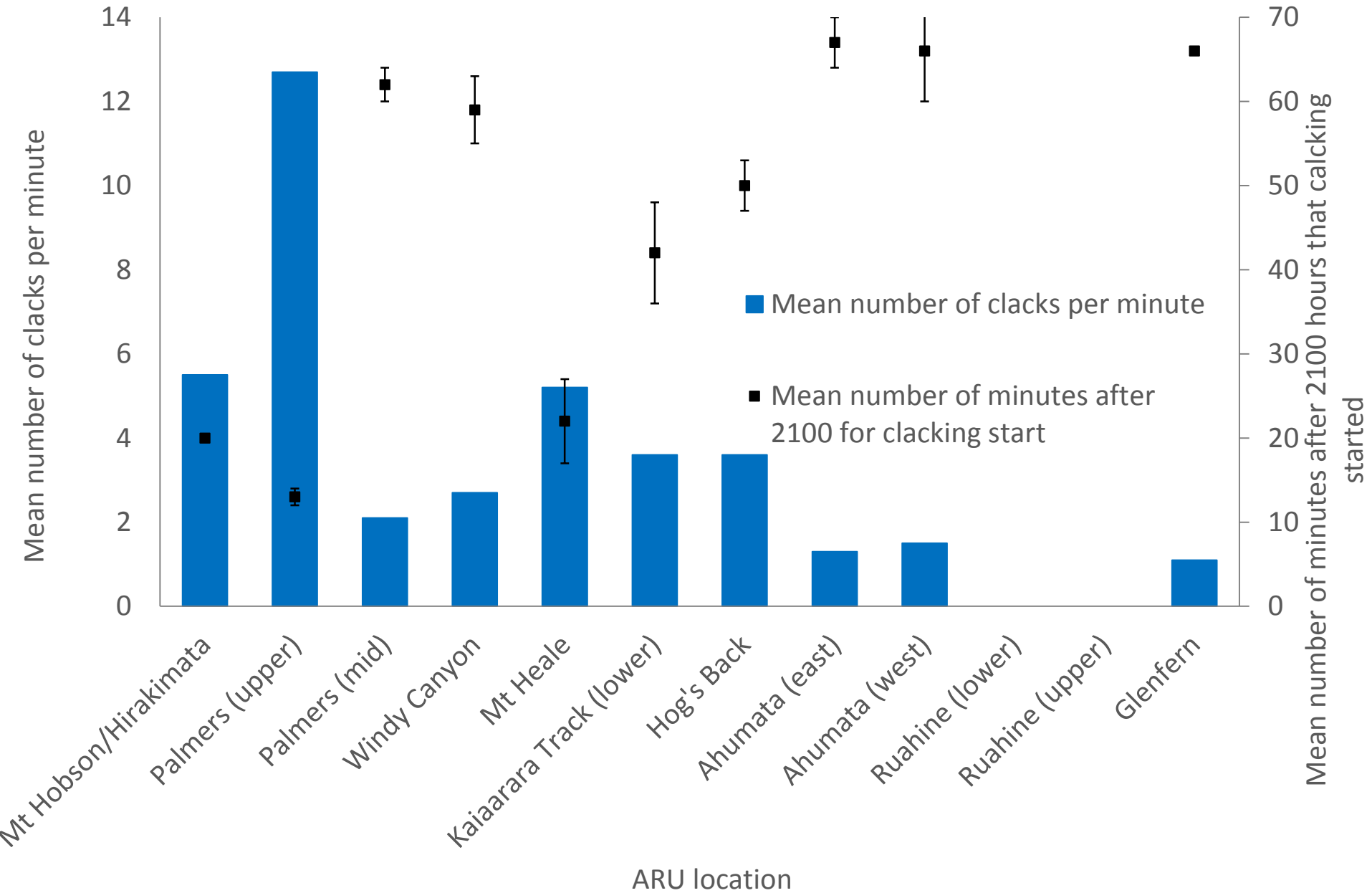
# RESULTS (GBI) continued:

- 17 Acoustic devices
  - Glenfern Sanctuary (1)
  - Windy Canyon (1)
  - Hog's Back (2)
  - Te Ahumata (White Cliffs) (2)
  - Hirakimata (10)
    - 1 per grid (K1, P1, S1)
    - 3 Palmer's Track
    - 3 Kaiaarara
    - 1 Mt Heale
  - Ruahine (2)
- 1020 nights and 2040 hours
  - Only 1555.1 hours suitable
  - Efficacy ranged 35.8-90.8%





# RESULTS (GBI) continued:



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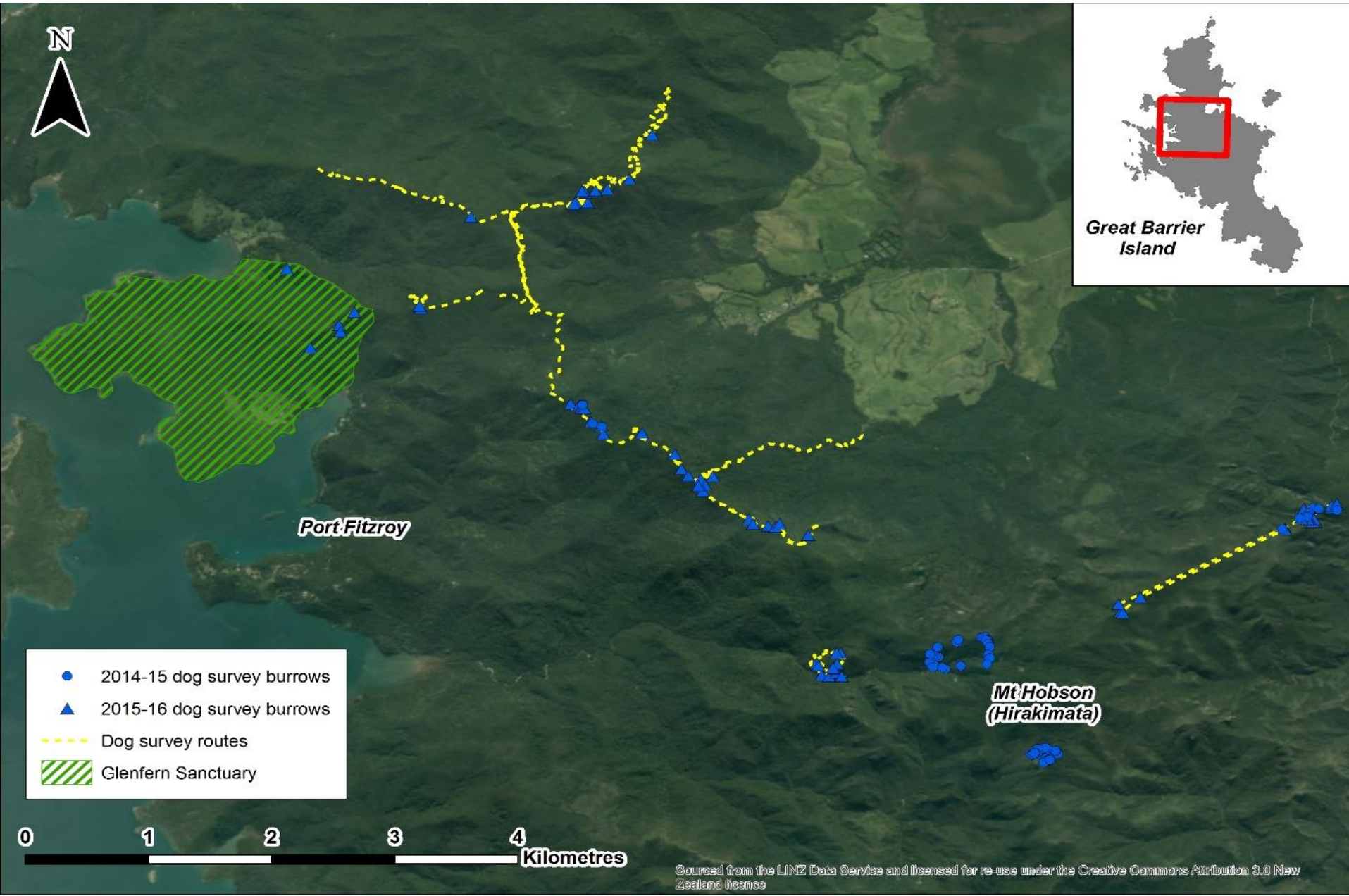
## SEABIRD-DETECTOR DOG SURVEYS

- 49.9 ha covered
- 80 burrows located
  - 50 breeding
  - 27 non-breeding
  - 3 unoccupied
- 1.5 burrows per ha
- Altitude range 98-429 m asl
  - Most over 200 m asl (93.75%)
  - Only 5 under 200 m asl (6.25%)





# RESULTS continued (GBI):





# GBI ADVOCACY:





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# WHERE TO FROM NOW ON GBI?

- Monitor long-term study burrows
- At-sea foraging location and behaviour data (NZ and international waters) using GLS, GPS and TDR devices
- Acoustic recorders
- Survey other areas of GBI
- Random transects through study area
- Trail cameras (chick provisioning and colony visit data)
- Thermal imagery cameras
- Continue advocacy and education (Iwi, local community, fishers and general public)





# AIMS (LBI):

## HAUTURU/LITTLE BARRIER ISLAND (LBI):

- Surveys of potential black petrel habitat using various techniques
- Identification of the suite of seabirds and their distribution on LBI
- Collection of detailed black petrel population dynamics, breeding status and capture/mark/recapture data



# METHODS (LBI):

## Population:

- ✓ Using study burrows
  - ✓ Mark-recapture of adults at the colony
  - ✓ Determine breeding success (and causes of failures)
  - ✓ Estimate population (and determine trends)

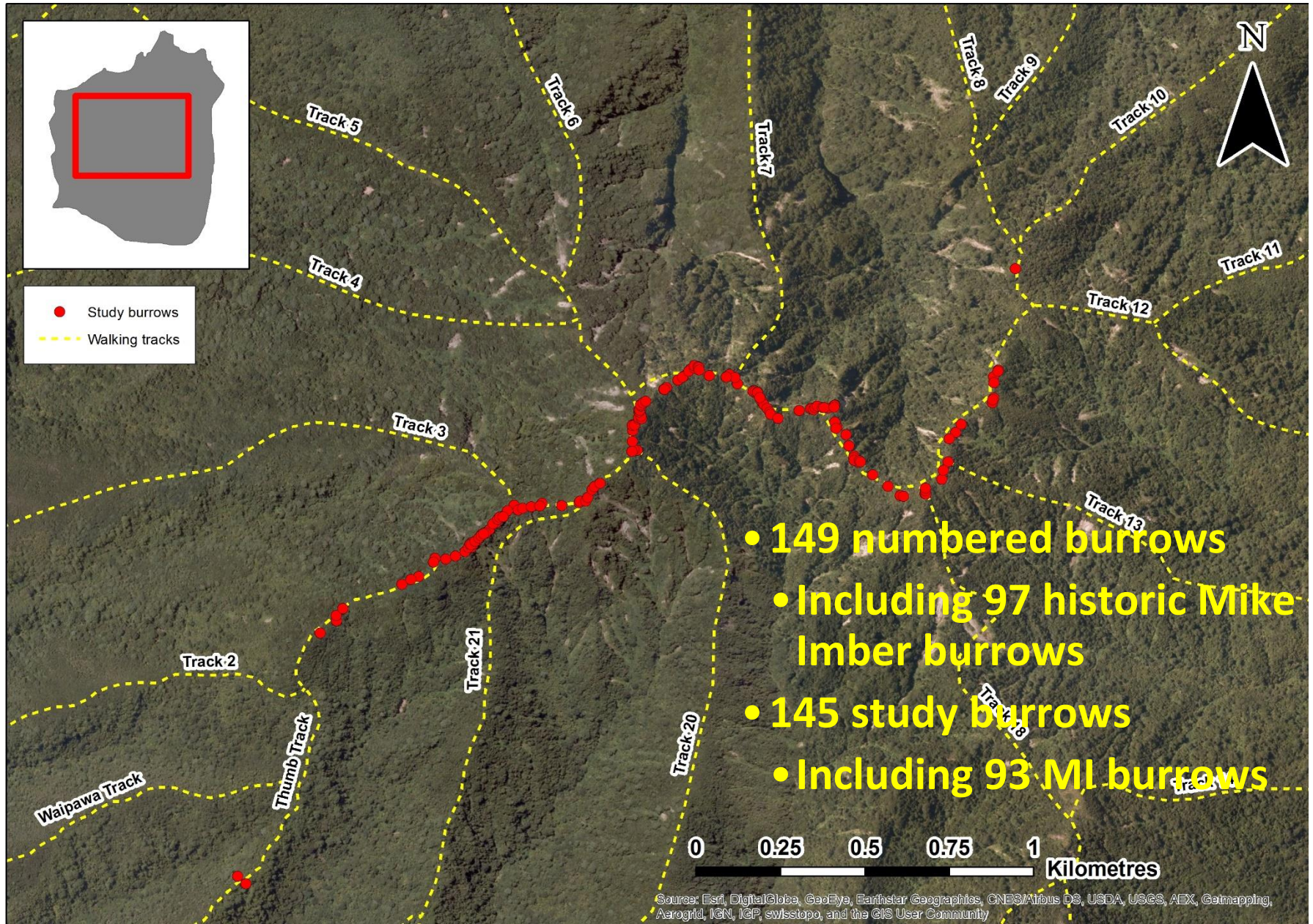
## Surveys:

- ✓ Seabird detector dogs
- ✓ Transects
- ✓ Using acoustic recorders
  - ✓ Along main ridgeline colony (for densities)
  - ✓ At other locations (for presence/absences and comparison with GBI & other LBI locations)
  - ✓ Identification of other seabirds (e.g. Cook's petrel, grey-faced petrel, NZSP, etc.)





# STUDY SITE (LBI):



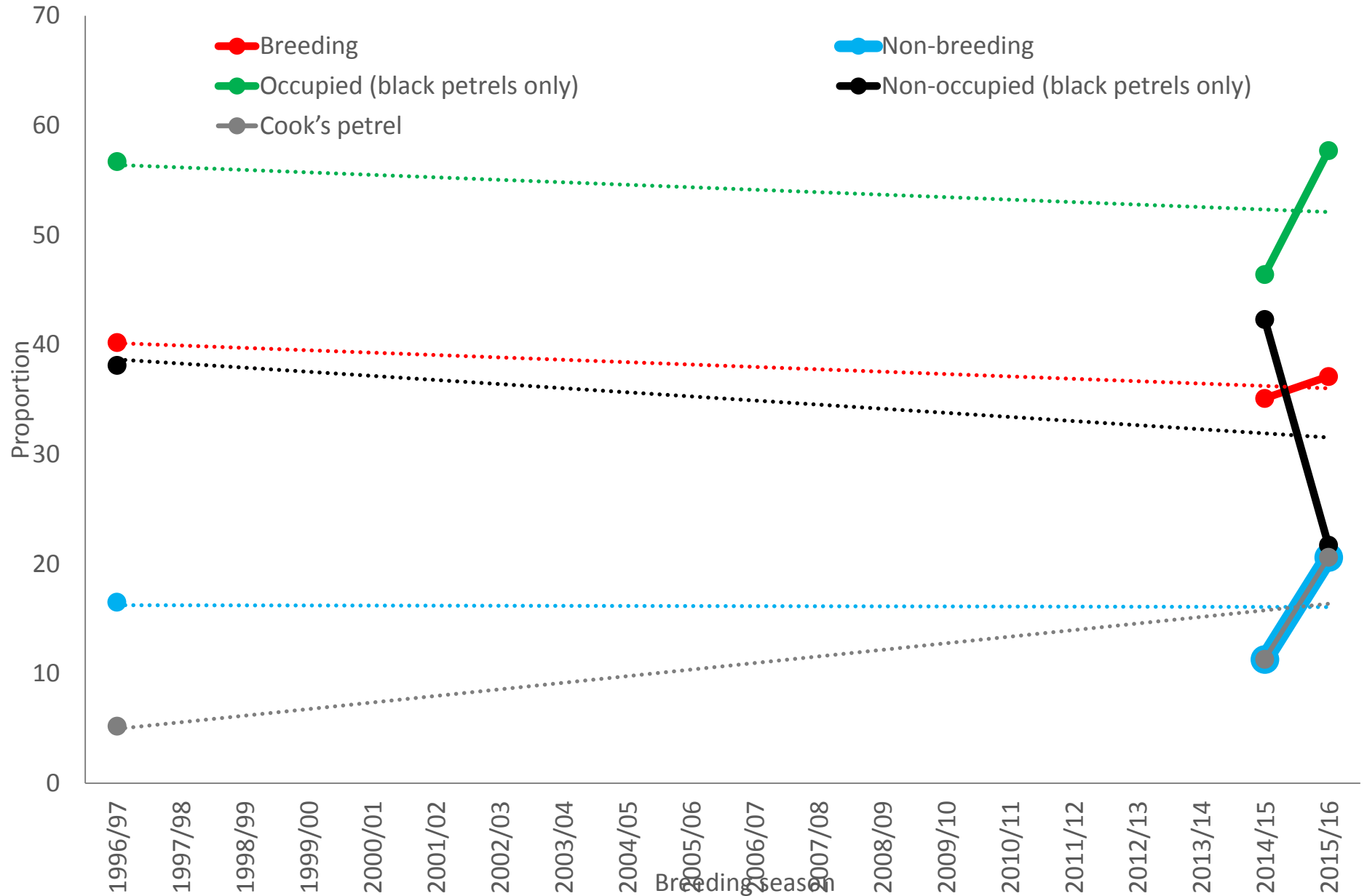


# RESULTS (LBI):

- 145 study burrows:
  - 81 breeding burrows
    - 12 failures  
(including crushed eggs 25%, infertile eggs 17%, dead embryo 8%, disappeared egg 17 % and dead chicks 34%)
  - 26 non-breeding burrows
  - 38 unoccupied burrows or taken over by Cook's petrels
- Number of study burrows used for breeding = **2015/16 = 37.1%**
  - compared to 40% in 1996/97
- Breeding success (chicks fledged from eggs laid) = **2015/16 = 85.2%**



# RESULTS (LBI) continued:



# RESULTS (LBI) continued:

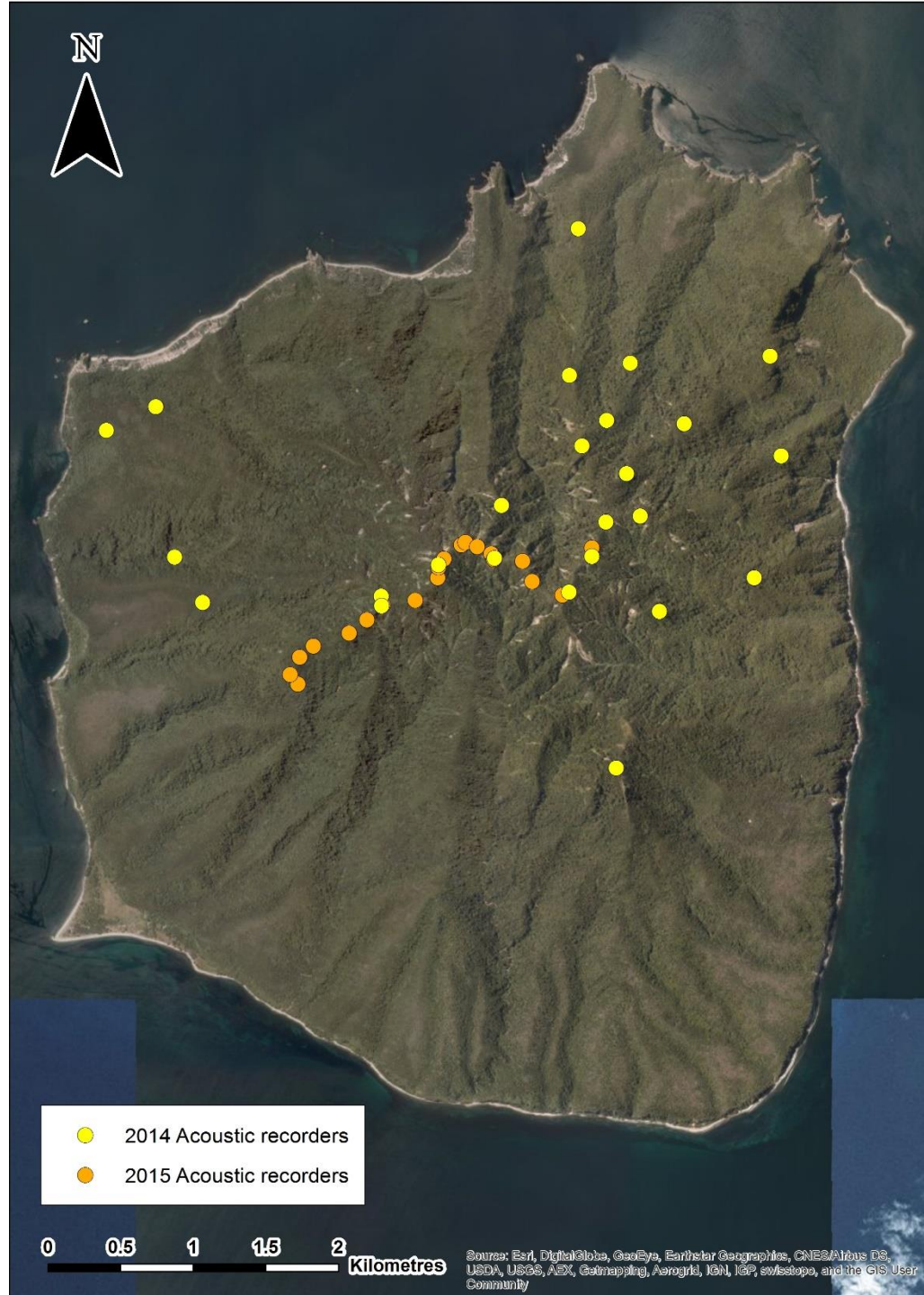
- **112 adults this season**
  - 10 already banded
  - Female from GBI now breeding on LBI
  - A 1986 transfer chick (from GBI to LBI) resident on LBI
  - Four males recaptured in the same burrows as originally caught in from 1993, 1997, 1999 and 2008
  - Two females recaptured in the same burrows as originally caught in from 2001 and 2007
  - One pair together in 1997 are still together, but moved to a neighbouring burrow
- **132 chicks this season**





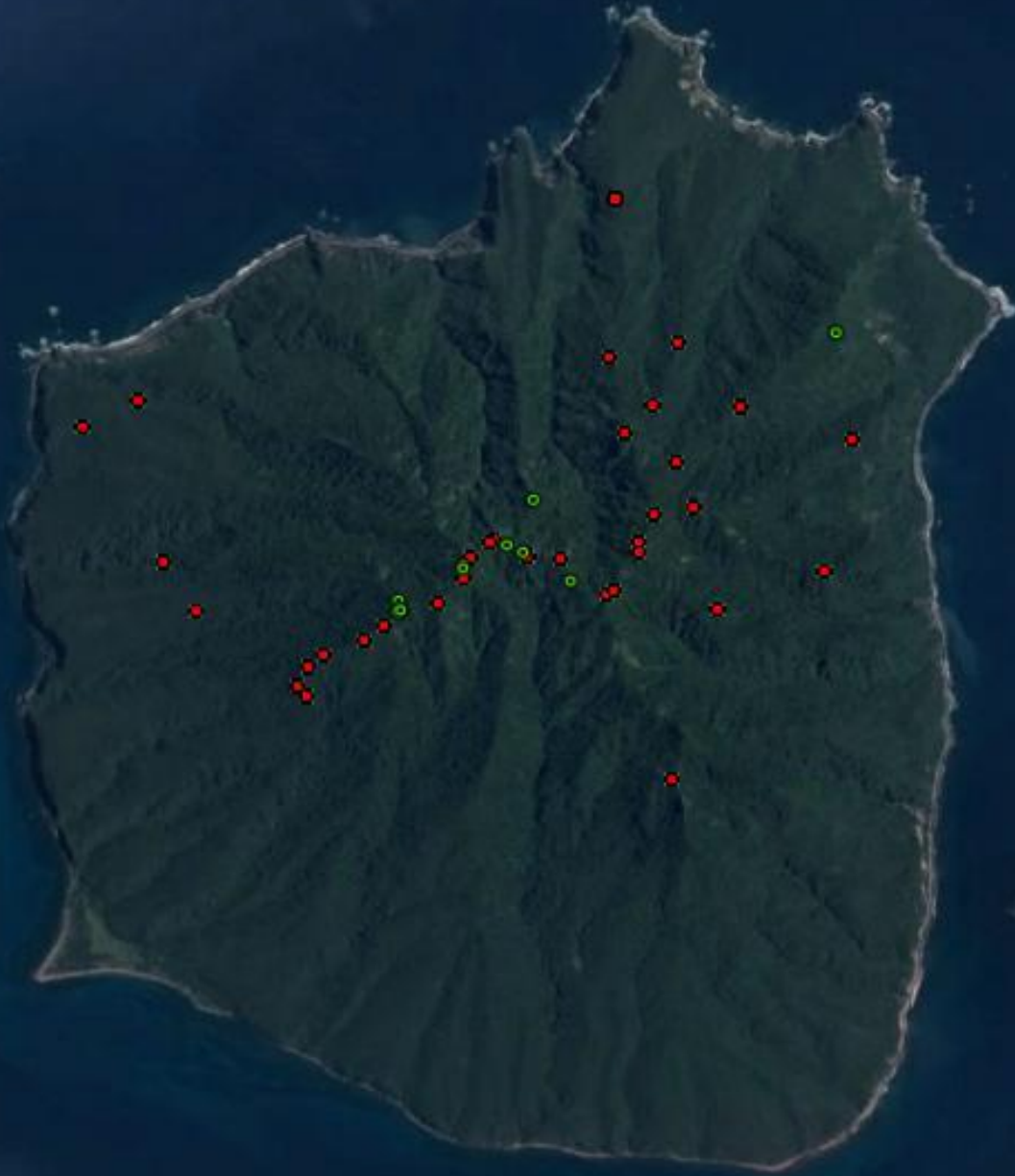
# RESULTS (LBI) continued:

- 20 Acoustic devices
- 2 hours per night between 1 December 2015 and 16 February 2016
- 940 nights, 940 hours
  - Only 722 hours suitable
  - Efficacy ranged 51-93%
- **Only 5 detected black petrels**



# RESULTS (LBI) continued:

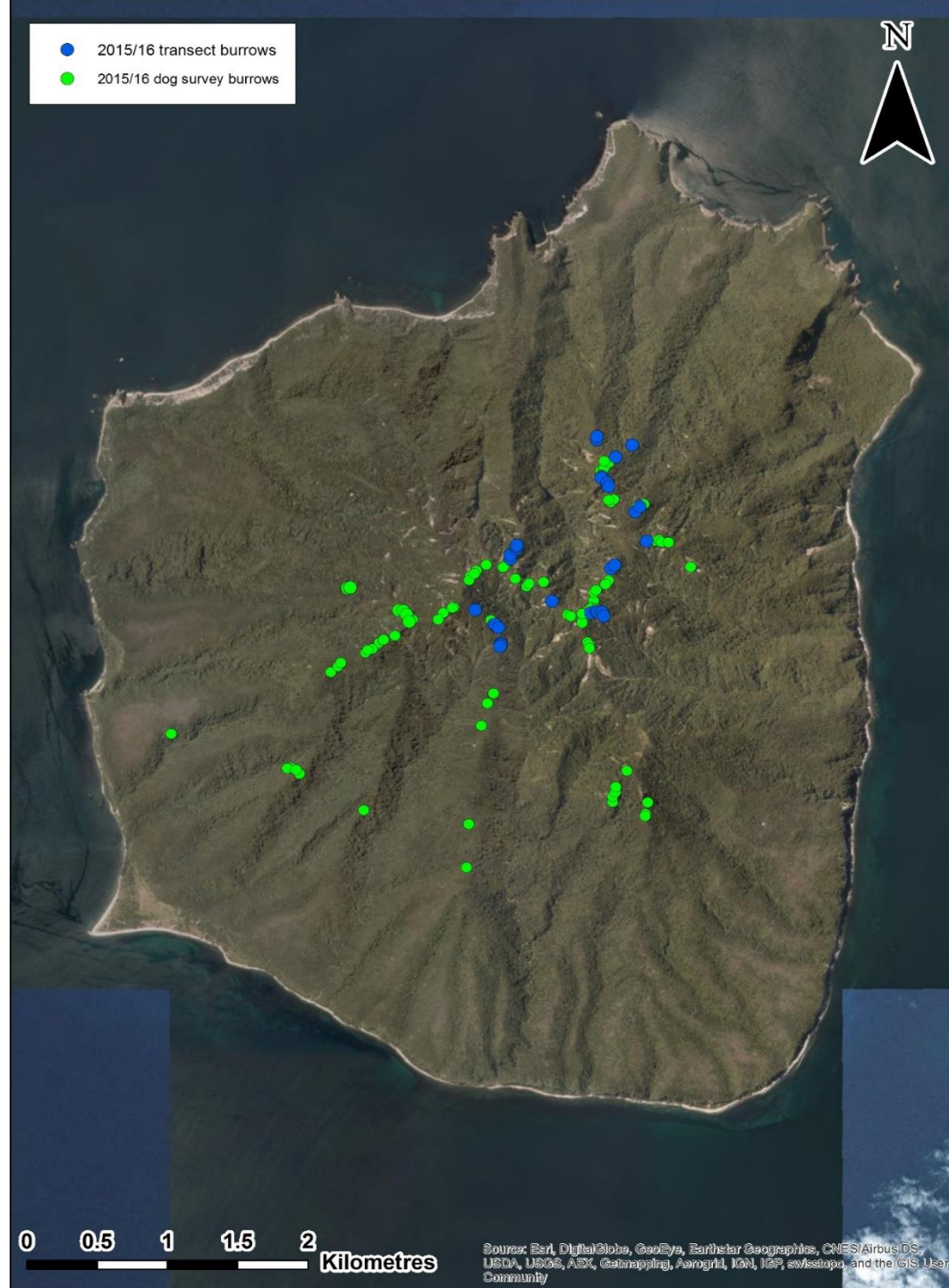
- Clacking started between 2153 and 2233
- Call rate only 0.02 clacks per minute
  - Compared to GBI at 3.3 per minute, ranging between 1.1-12.7)





# RESULTS (LBI) continued:

- 36 transects (covering 5.76 ha)
- 72.9 ha covered by dog
- **243 burrows**
  - 170 breeding
  - 23 non-breeding
  - 50 unoccupied
- Habitat preference to ridges
- Majority over 500 m asl
  - Only 7.1% below 500 m





# RESULTS (LBI)

## continued:

- Majority over 500 m asl
  - Only 7.1% below 500 m asl
- Total area surveyed 78.66 ha
- 2.2 breeding burrows per ha
- Using area over 500 m asl = 281 ha
- **Population estimate = 620 breeding pairs**



# WHERE TO FROM NOW ON LBI?

- Monitor study burrows
- Acoustic monitoring across island
- Survey other areas across the island
  - Transects and seabird detector dogs
- Thermal imagery cameras for non-invasive survey method
  - Compare burrow and habitat characteristics with GBI burrows

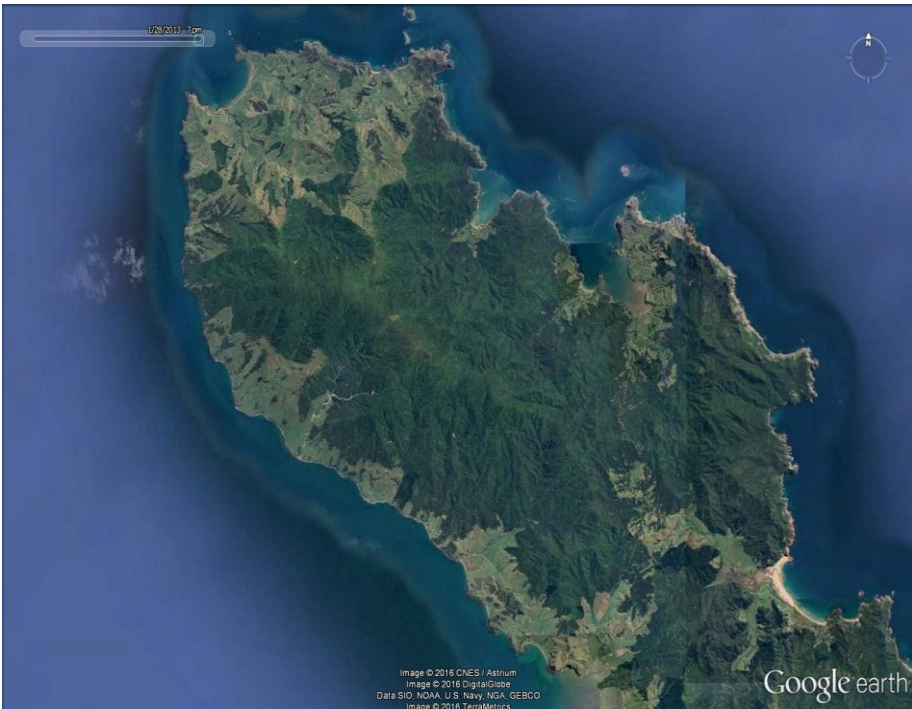




# AIMS (MOEHAU):

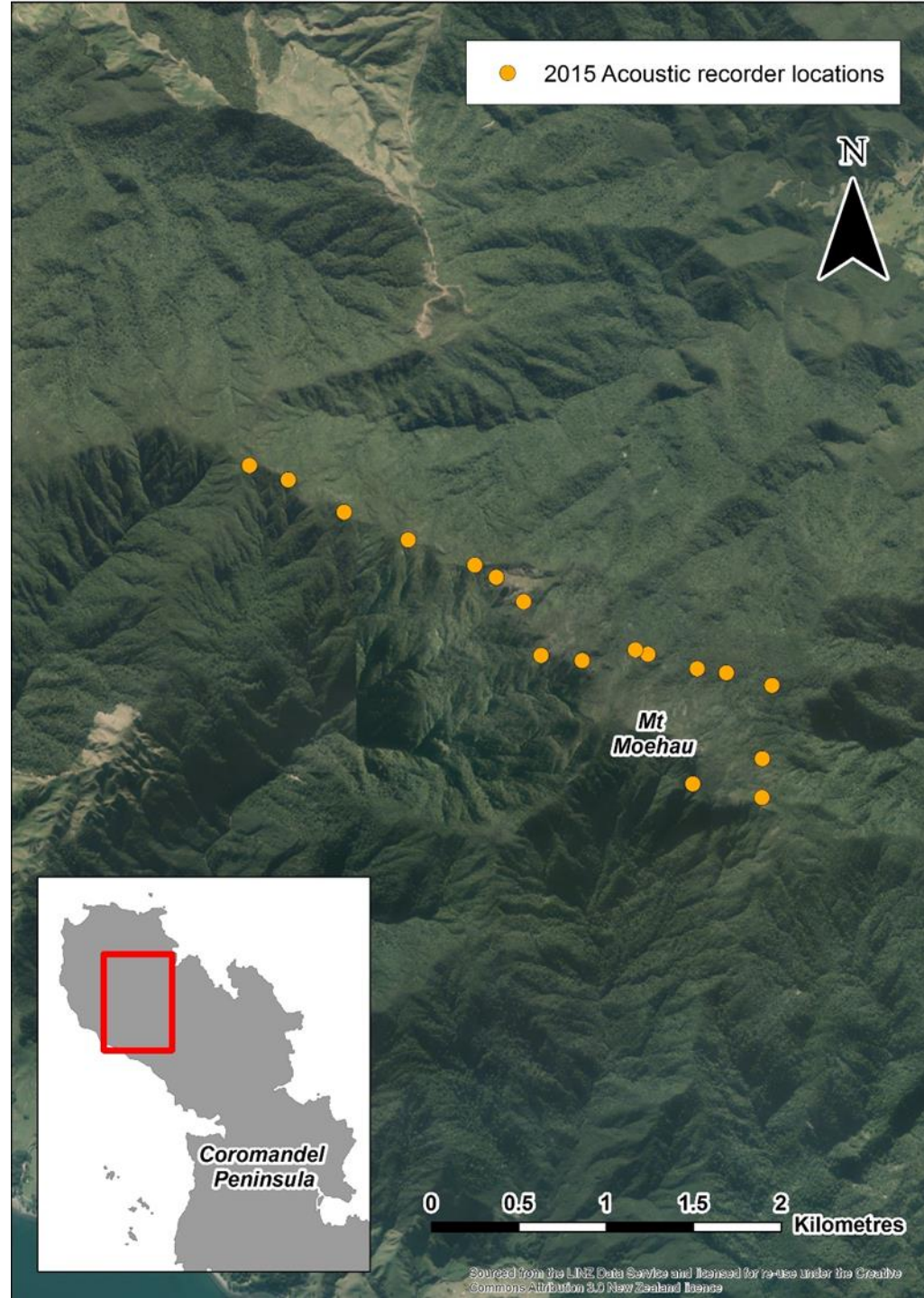
## MOEHAU RANGE:

- To identify the presence of black petrels (and other seabird species) on the Moehau Range, Coromandel using automated acoustic recorders



# RESULTS (MOEHAU):

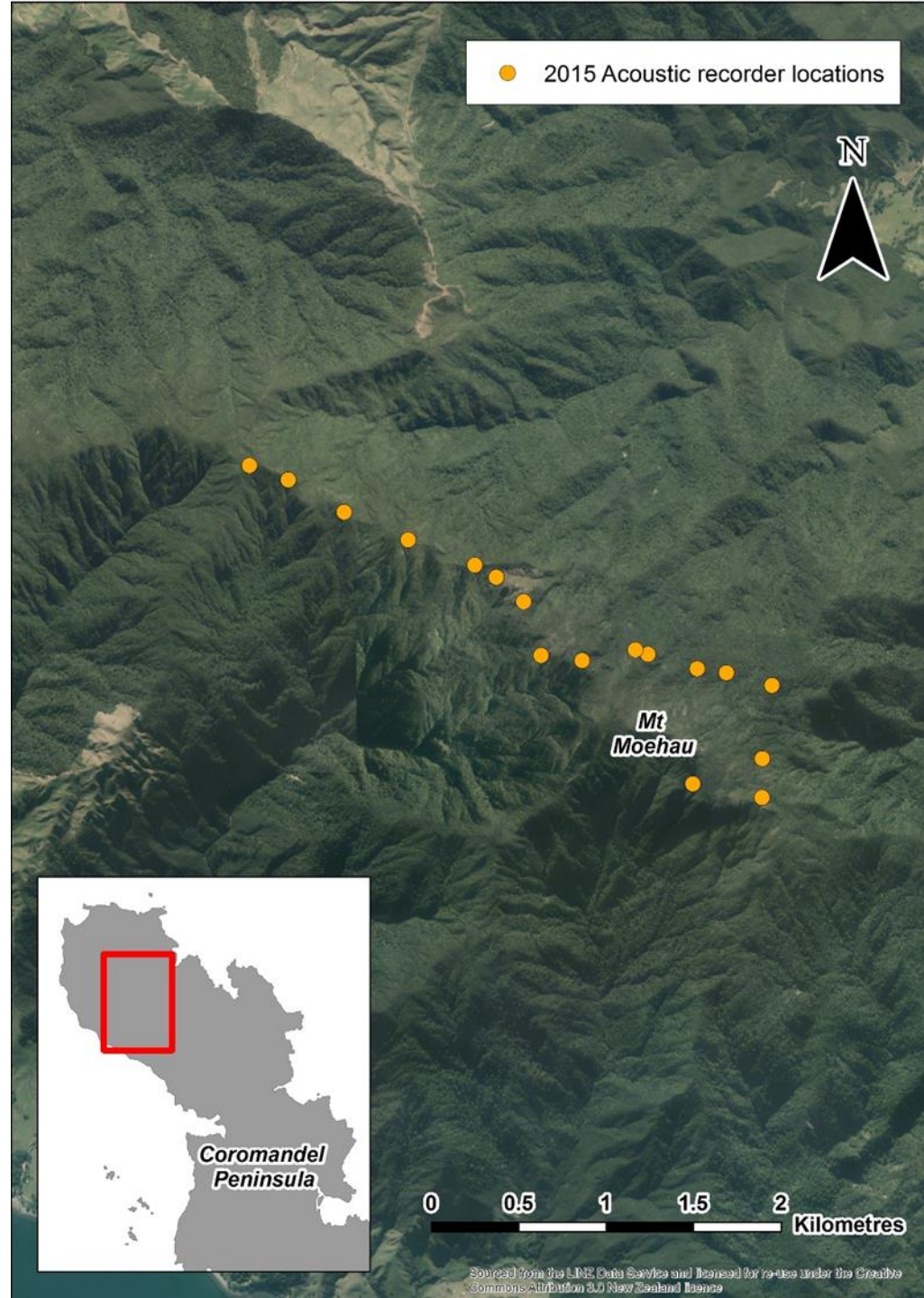
- 17 devices
  - only DOC ARU
  - between 30 November 2015 and 31 January 2016
- Focused on best habitat along ridgelines





# RESULTS (MOEHAU):

- **1054 nights,**  
**2108 hours**
  - 940 nights only
  - 1938 hours only
  - Dec-Jan
- No black petrel calls



# MOEHAU RESULTS:

- Cook's petrel
  - 7 episodes at 5 recorders
  - All in December
  - Between 2130 and 2258 hours
  - Ground & flight calls
  - Southern flanks of Moehau Range





# WHERE TO FROM NOW FOR MOEHAU?

- Deploy acoustic monitoring devices on the Moehau Range (and surrounding area) to confirm ground calls of Cook's petrels (and detect any black petrels if present)
- Seabird workshop for Iwi, school teachers and fishers in region
- More visits to schools for advocacy



# ACKNOWLEDGEMENTS:

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- Collaborators: Joanna Sim, Chris Gaskin, Matthew McKown, Neil Fitzgerald, Paul Scofield, Chris Francis, Patrick Stewart, Leigh Torres, Tim Guilford, Scott Schaffer, Todd Landers and Todd Denis
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- Thanks to all the field assistants over the years (and there are lots of them).
- Photographs shared by Dave Boyle, Nikki McArthur, NZ Birds Online and Google Images.
- **Annual reports are published by DOC and WMIL and are available from [www.doc.govt.nz](http://www.doc.govt.nz) or [biz@wmil.co.nz](mailto:biz@wmil.co.nz) as PDF files**





A dark-colored bird, possibly a frigatebird, is shown in profile, facing left. It has a long, hooked beak with a lighter-colored tip. The bird is standing on a rocky, uneven surface with some moss or lichen. A light blue speech bubble with a black outline is positioned above the bird's head, containing the text "Any questions?".

**Any questions?**