

# Terrestrial and marine distribution of hoiho on Motu Ihupuku/ Campbell Island: Year 1

Interim report: 08 October 2024

Mel Young<sup>1</sup>, Thor Elley<sup>1,2</sup>, Janelle Wierenga<sup>1,2,3</sup>, Leith Thomson<sup>1</sup>, and Julia Reid<sup>1</sup>

1: Marine Bycatch and Threats, Department of Conservation

2: University of Otago

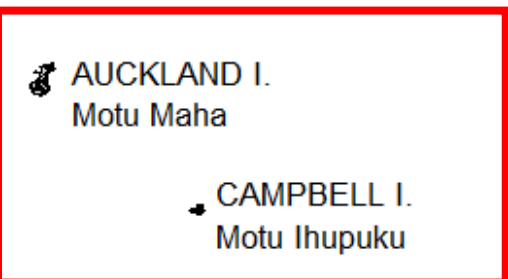
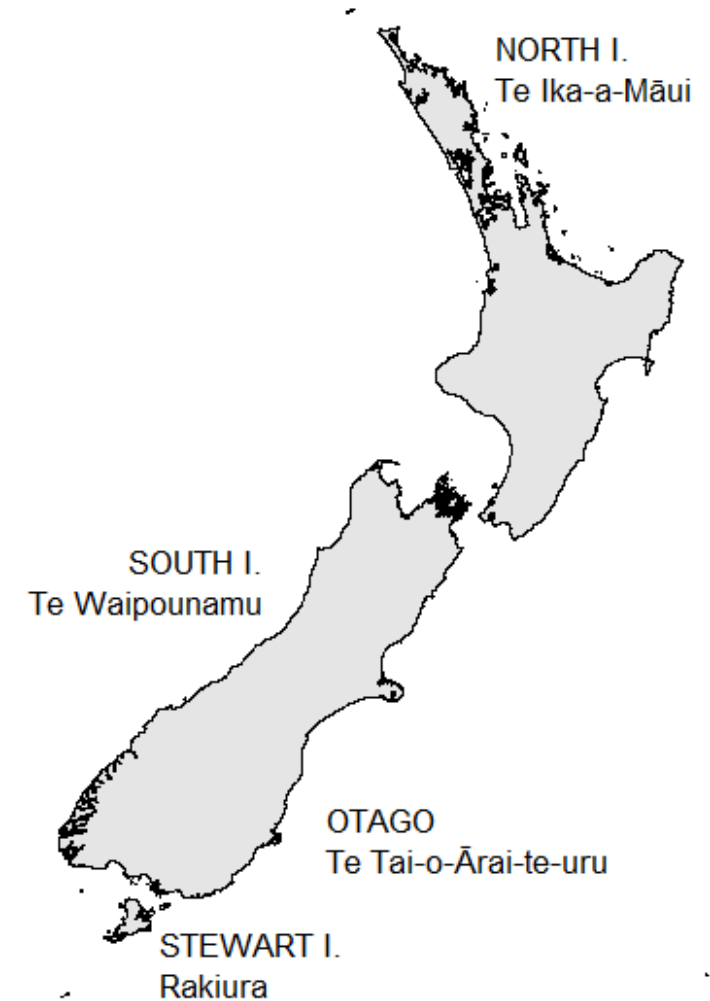
3: Massey University



New Zealand Government

# Southern population of hoiho

- > Auckland Islands ~ 577 breeding pairs (2015-2018)
  - > *Distribution survey completed 2009*
  - > *Limited at-sea tracking (2016 – 2018, 2022)*
- > Campbell Island ~ 490 – 600 breeding pairs (1987-1998)
  - > *Distribution survey completed 1992*
  - > *Limited at-sea tracking (1995, 2023)*



# Work programme – Year 1

December 2023 – February 2024 (10 weeks)



Diet



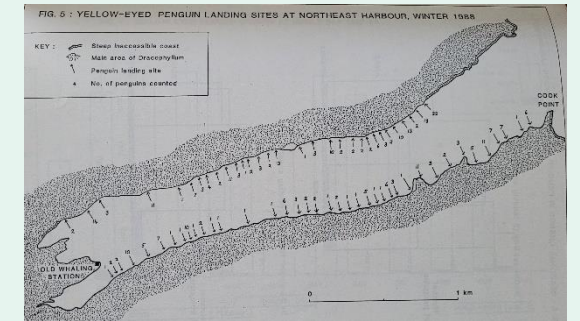
Marine habitat utilisation





Confirm distribution and methods

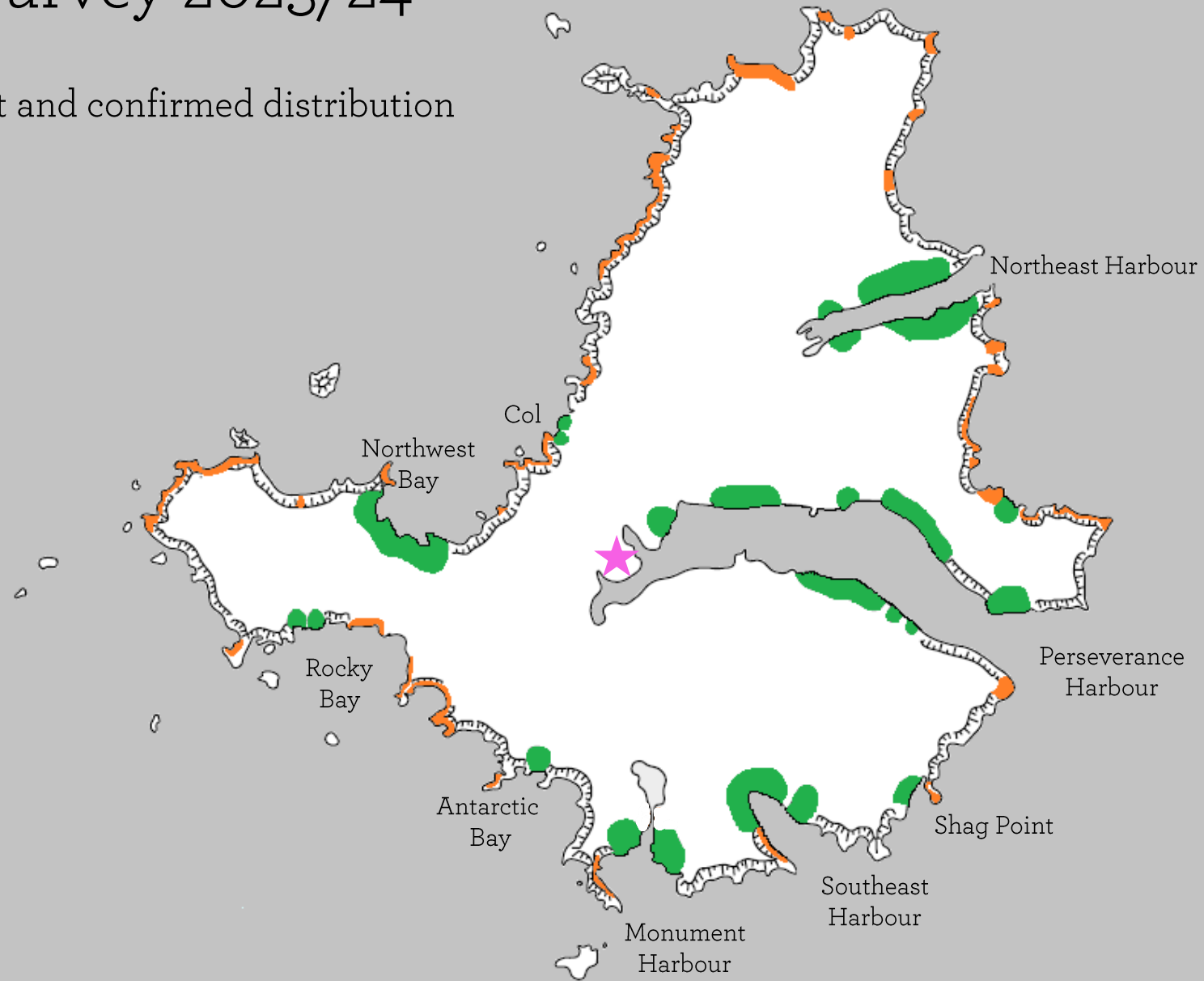


Health monitoring  
Disease surveillance



# Distribution survey 2023/24

-  Accessible by foot and confirmed distribution
-  Inaccessible





Distribution survey 2023/24



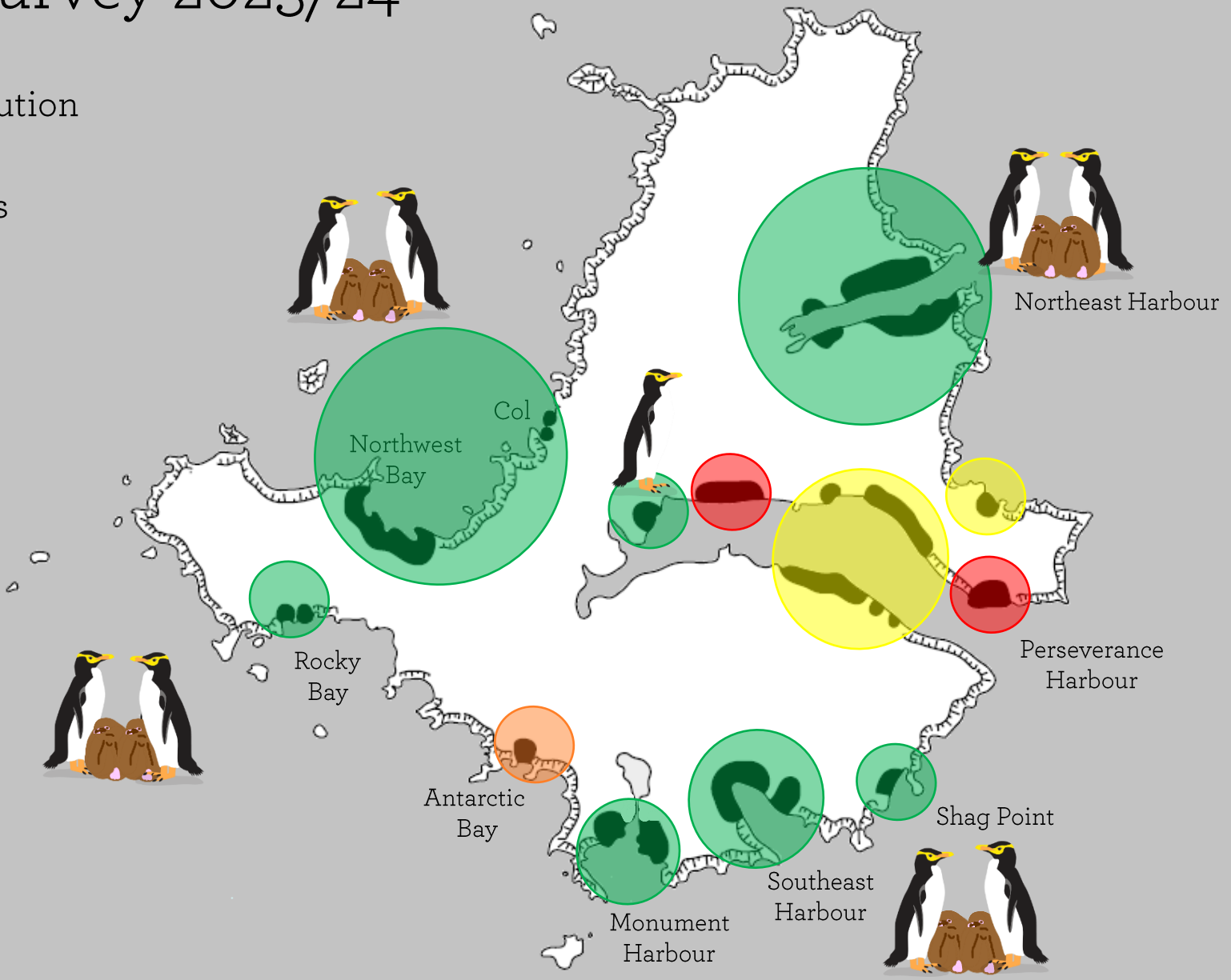






# Distribution survey 2023/24

- Confirmed distribution
- Inaccessible: Cliffs
- Unable to survey
- No sign of hoiho





# Landing site counts

1987/88





# Using simple technology smarter

Beach counts using image recognition AI



Identifying 'terrain traps' for microchip mark-recapture





Marine distribution 2023/24

Guard stage adults

Post-guard adults

Moutere Ihupuku  
Marine Reserve  
1133 km<sup>2</sup>

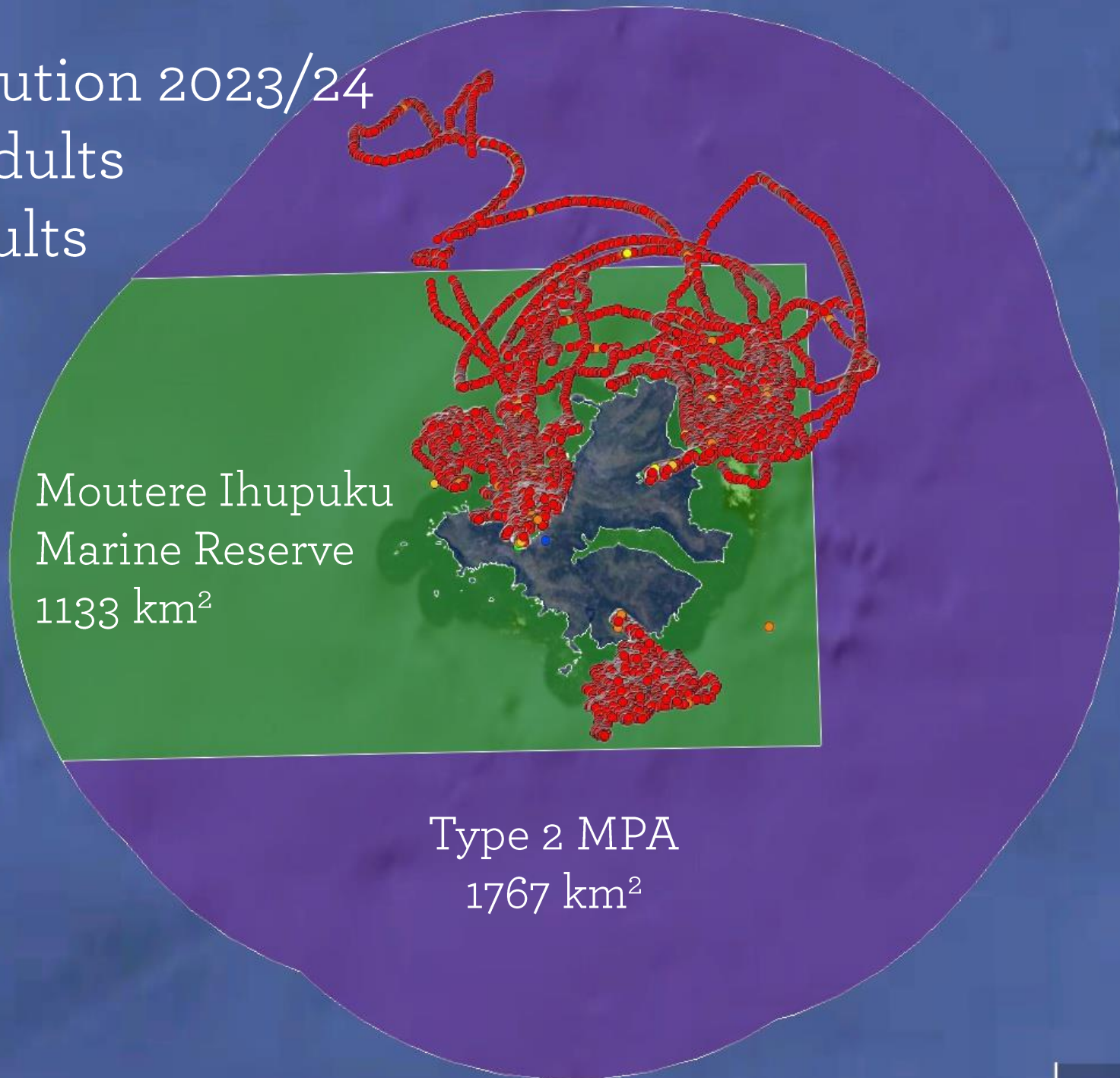
Type 2 MPA  
1767 km<sup>2</sup>

Google Earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image © 2024 Airbus



20 km








## Northwest Bay

Guard stage (n = 3 adults)

**Female (2d)**  
**Pelagic strategy**  
**Max depth = 79.1m**  
**Max distance = 20.2km**

### Legend

-  Female (2d overnight)
-  Male (2d overnight)
-  Male (2x 1d)

**Male (2d)**  
**Benthic strategy**  
**Max depth = 68.2m**  
**Max distance = 1.4km**

**Male (2d)**  
**Benthic strategy**  
**Max depth = 23.6m**  
**Max distance = 0.6km**

Google Earth

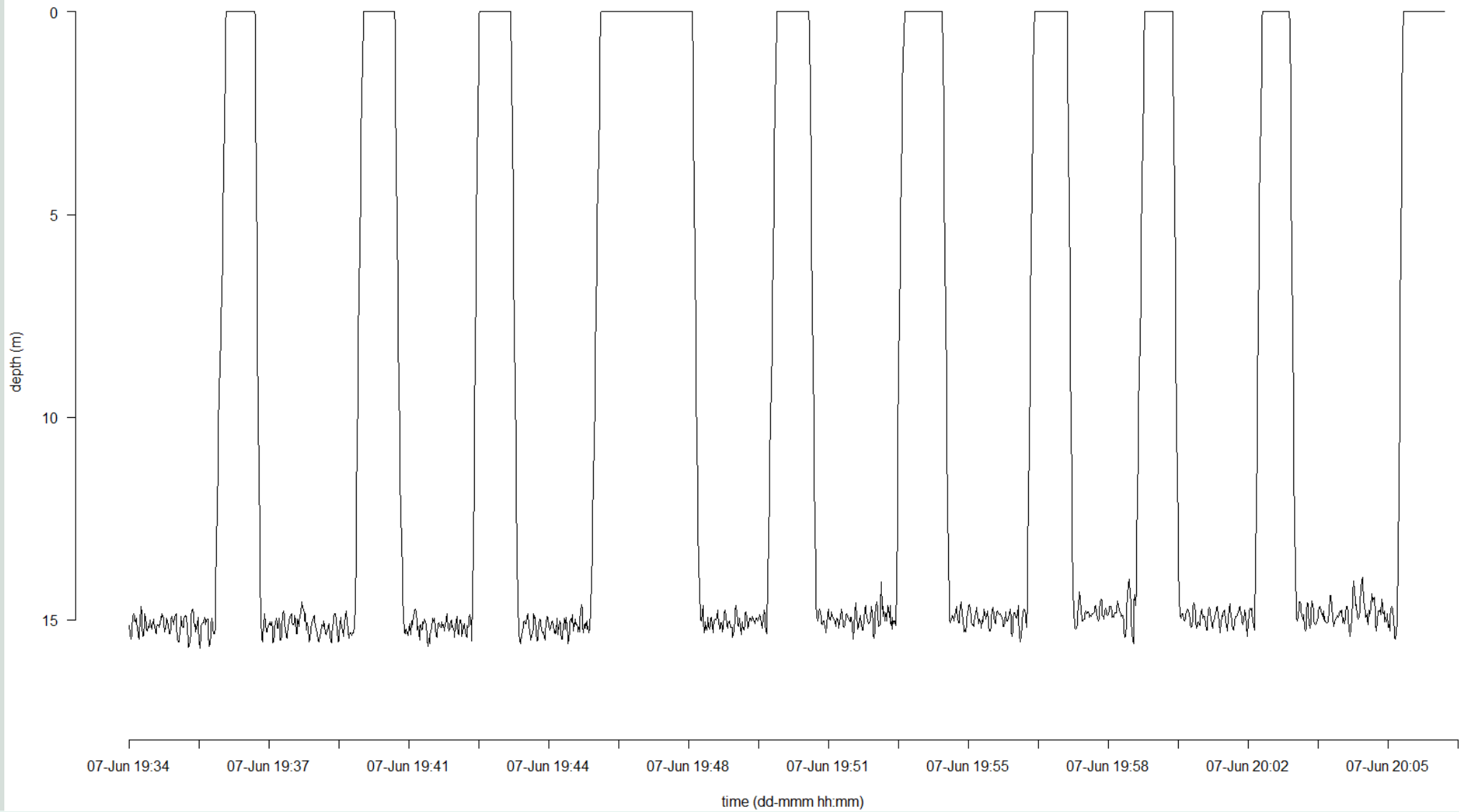
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2024 Airbus



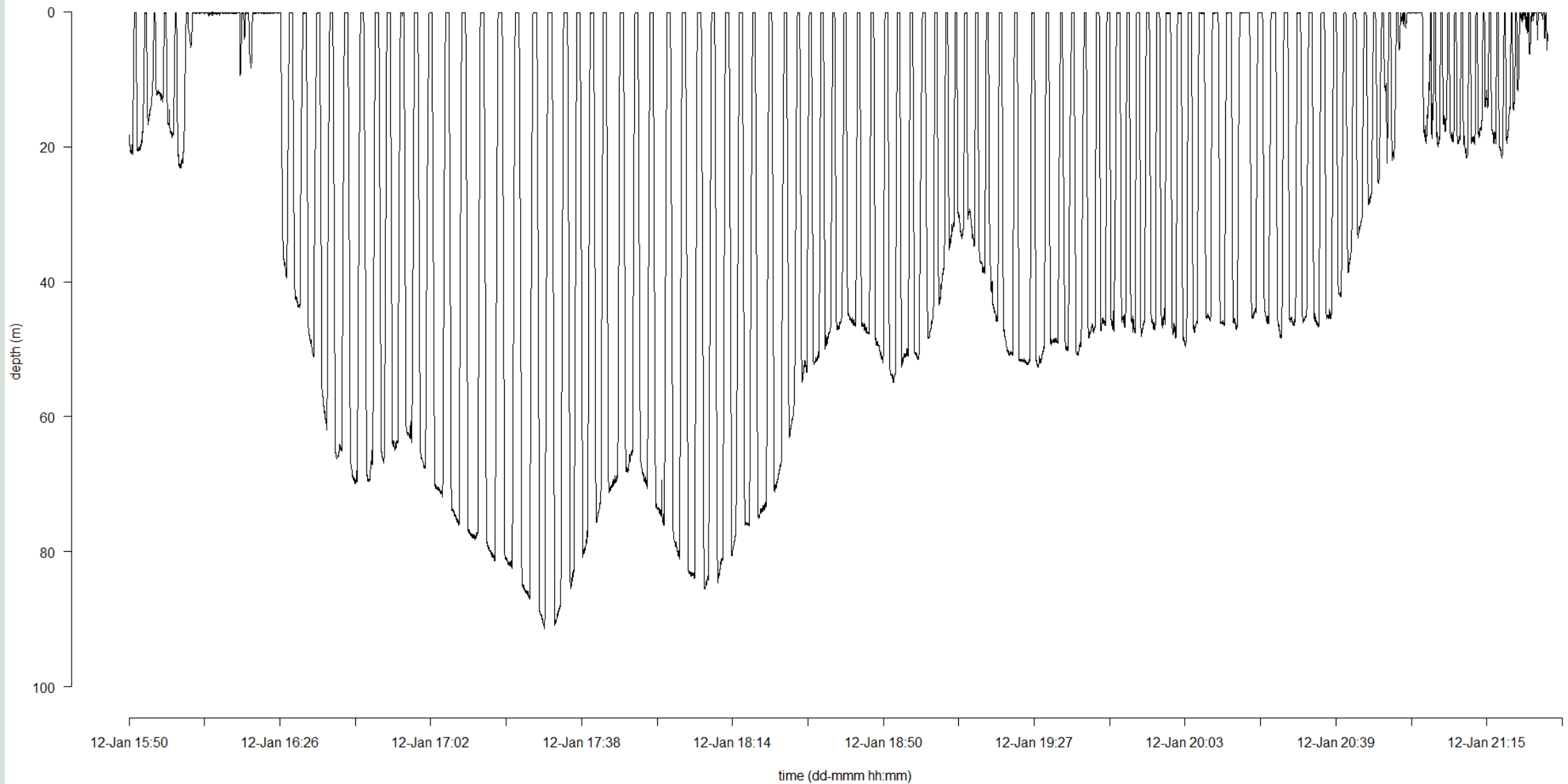
10 km





## U-shaped benthic dives





## U-shaped benthic dives

## Northwest Bay

Postguard stage (n = 5 adults)

**Female (9d)**  
Benthic strategy  
Max depth = 151.4m  
Max distance = 6.6km

### Legend

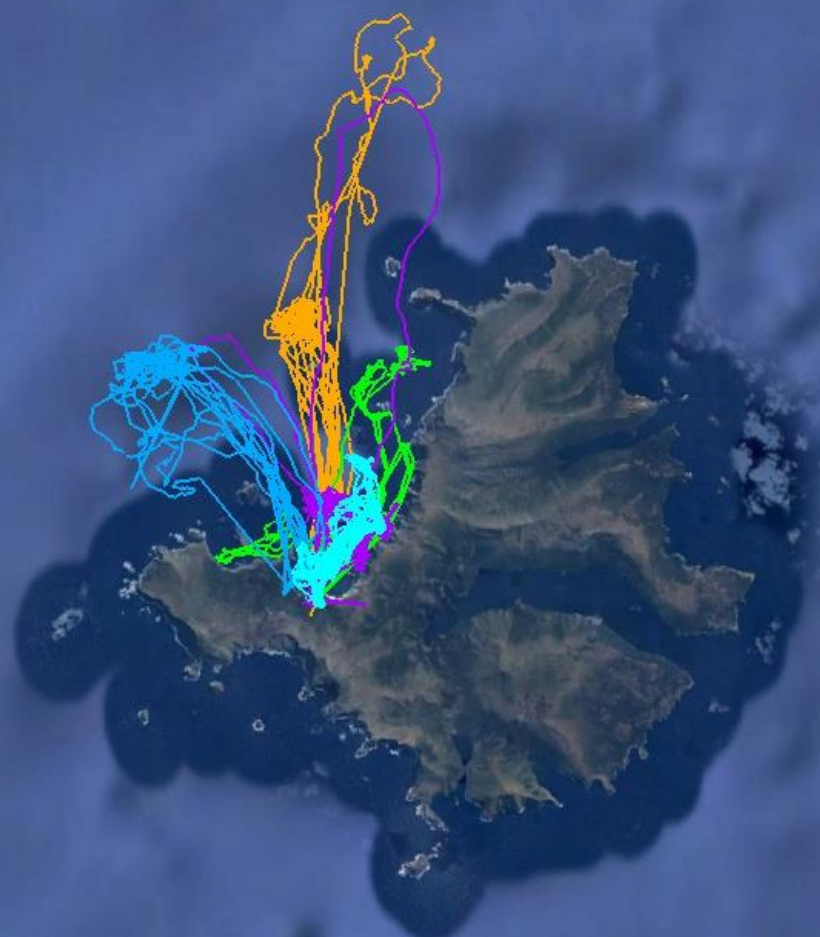
- Female (7d)
- Female (9d)
- Female (9d)
- Male (11d)
- Male (8d)

**Female (7d)**  
Switcher strategy  
Max depth = 100.6m  
Max distance = 5.6km

**Female (9d)**  
Switcher strategy  
Max depth = 68.5m  
Max distance = 2.1km

**Male (11d)**  
Benthic strategy  
Max depth = 147.7m  
Max distance = 5.7km

**Male (8d)**  
Benthic strategy  
Max depth = 94.8m  
Max distance = 1.7km



Google Earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2024 Airbus



10 km



# Northeast Harbour

Guard stage (n = 5 adults)  
Postguard stage (n = 1 adult)

**Male (4d)**  
Benthic strategy  
Max depth = 142.0m  
Max distance = 12.1km

**Male (4d)**  
Benthic strategy  
Max depth = 137.7m  
Max distance = 8.0km

**Male (5d)**  
Benthic strategy  
Max depth = 141.2m  
Max distance = 11.3km

## Legend

- Female (4d)
- Female (4d)
- Male (4d)
- Male (4d)
- Male (5d)
- Male (5d)

**Female (4d)**  
Benthic strategy  
Max depth = 146.9m  
Max distance = 13.1km

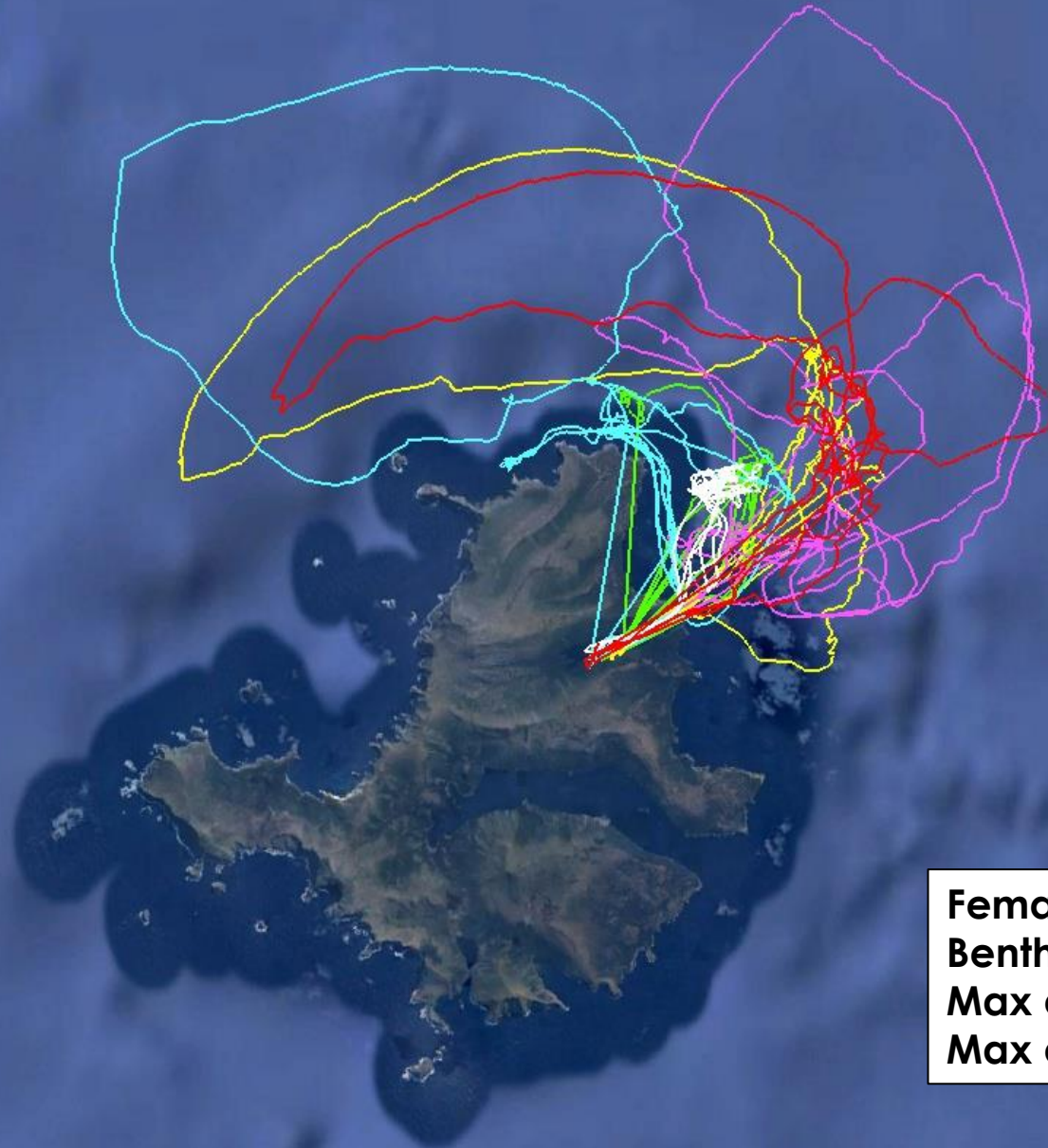
**Male (5d)**  
Benthic strategy  
Max depth = 122.5m  
Max distance = 3.9km

**Female (4d)**  
Benthic strategy  
Max depth = 90.5m  
Max distance = 3.1km

Google Earth



10 km

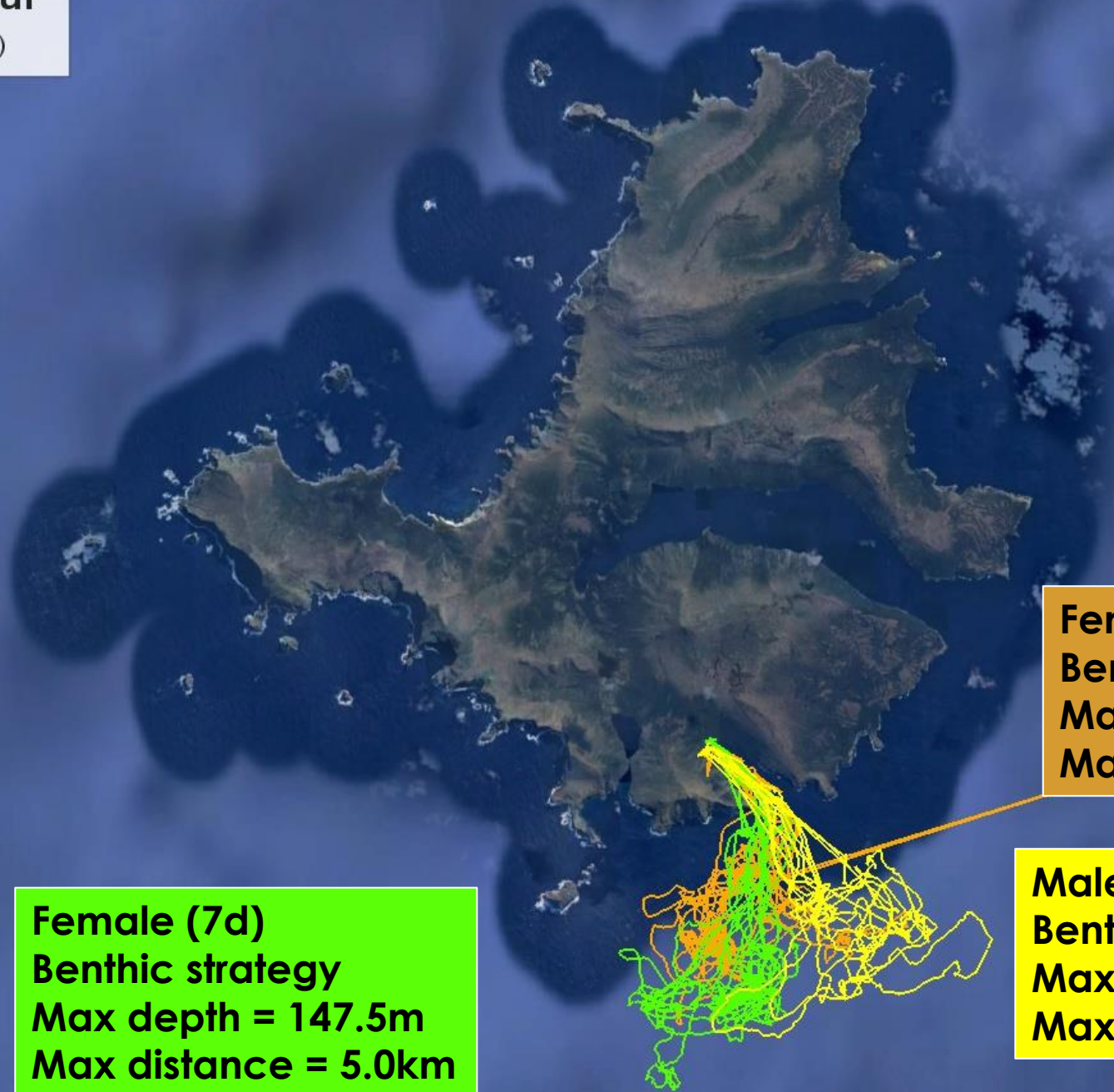


# Southeast Harbour

Postguard stage (n = 3 adults)

## Legend

- Female (7d)
- Female (7d)
- Male (3d)



**Female (7d)**  
Benthic strategy  
Max depth = 133.7m  
Max distance = 3.8km

**Female (7d)**  
Benthic strategy  
Max depth = 147.5m  
Max distance = 5.0km

**Male (3d)**  
Benthic strategy  
Max depth = 142.9m  
Max distance = 4.5km

Google Earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image © 2024 Airbus

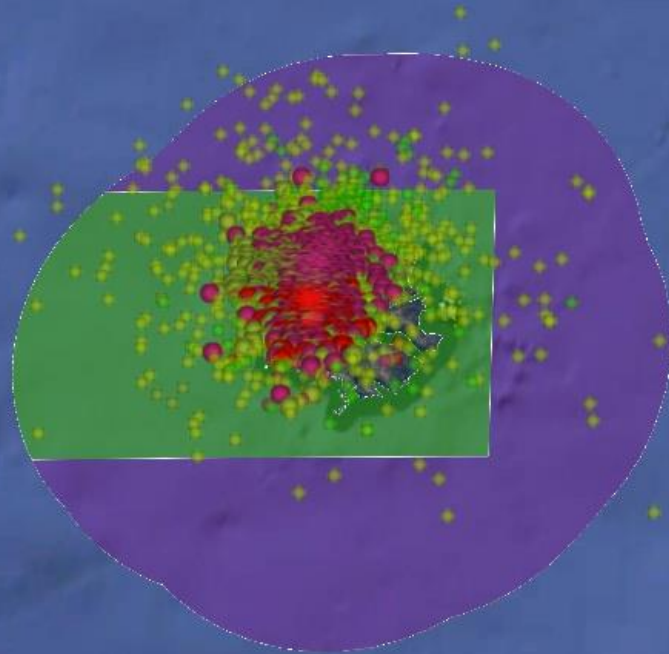




# Campbell Island

Postguard and pre-moult tracking

2023/24 (n = 6 adults)



Google Earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO



60 km

# Campbell Island

Postguard and pre-moult tracking

2022/23 (n = 9 adults)









# Diet

## Animal-borne camera deployments (n = 6)

- 3 recorded day trips, 2 were prematurely activated, 1 recorded but subsequently failed

## Preliminary results:

- Benthic dives =  $82 \pm 18\%$  of all observed dives
- Mean dive time =  $155 \pm 57s$
- High prey capture success =  $78 \pm 17\%$  of all observed dives
- Prey captures per dive =  $2.96 \pm 3.1$  items
- Many prey 'unidentifiable'

## Genetic analysis

- INT2023-06 Investigating the impact of fisheries on endangered hoiho diet, microbiome, and disease susceptibility
- Faecal samples (n = 101) were retained from individuals tracked at sea in 2023/24
- Analysis is pending



# Disease screening

## Collaboration with Geoghegan Lab, University of Otago

- Oral and cloacal swabs (n = 95)
- Post-mortem of deceased chicks (n = 2) and failed eggs (n = 8)
- Blood samples (n = 66)

## Preliminary results:

- Cause of chick deaths inconclusive
- 65% (healthy) adults positive for gyrovirus
- More samples are required from chicks in 2024/25

## Collaboration with Wildbase, Massey University

- Blood cards (n = 66)
- Testing for haemoparasites (e.g. *Plasmodium*, *Leucocytozoon*)
- Results pending

# Work programme – Year 2

February – March 2025 (6 weeks)



Diet

Marine habitat utilisation



- Post-guard adults
- Pre-moult adults
- Pre-moult juveniles
- Post-fledging dispersal



Use technology and AI to confirm counts  
Produce population estimate





**Thanks to: Hendrik Schultz, Joris Tinnemans, Kat Manno, Kris Ramm, Hollie McGovern, Sharon Trainor, Janice Kevern, Allan Ward, Chris Hankin, Steve Kafka, Murray Watson, Roger Gibson.**

**This work was funded by the Conservation Services Programme and DOC.**