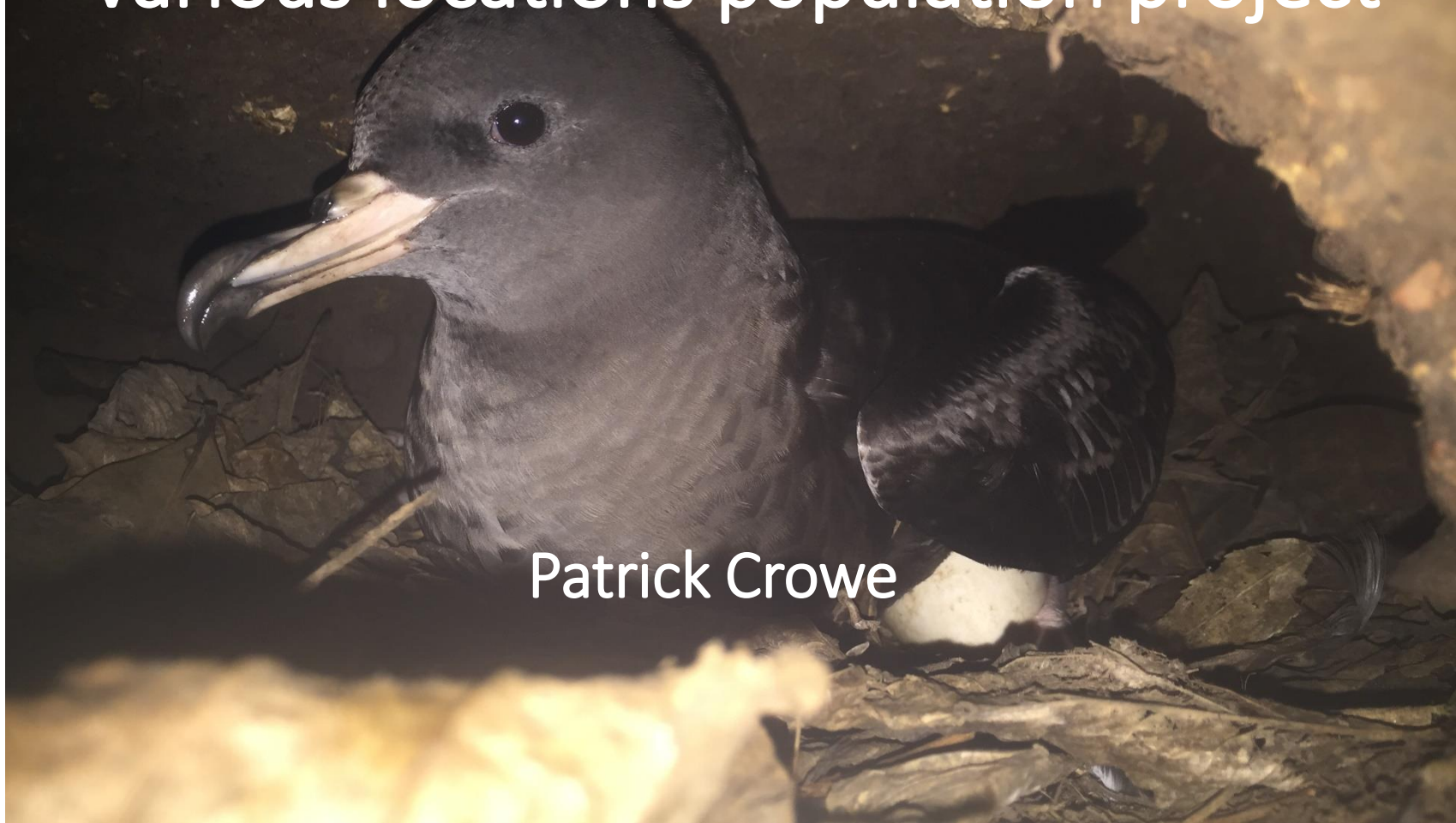


POP2015-02 Flesh-footed shearwater: Various locations population project



Patrick Crowe

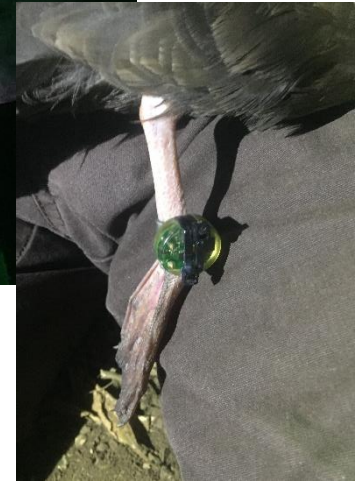
Project Objectives

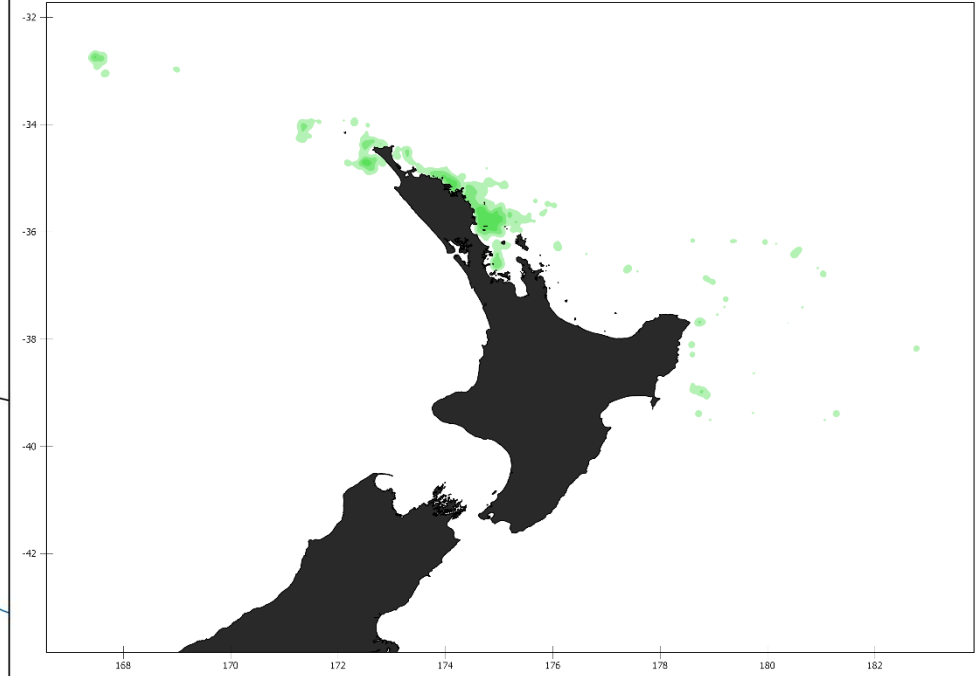
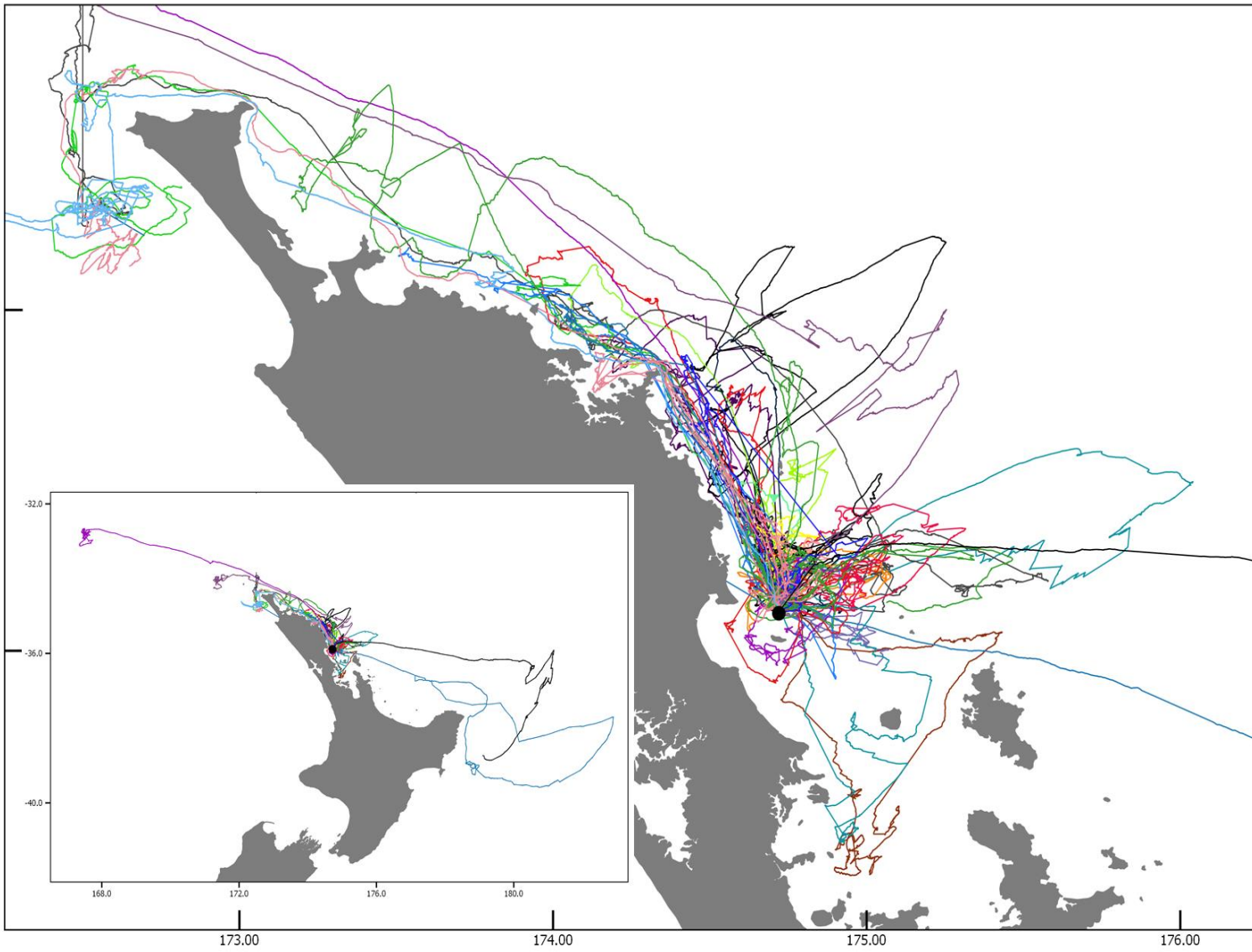
- ~~1. To estimate the population size of flesh-footed shearwater at Middle Island (Mercury Islands).~~
- 2. To estimate key demographic parameters of flesh-footed shearwater at Lady Alice Island/Mauimua and Ohinau Islands.
- 3. To describe the at-sea distribution of flesh-footed shearwater breeding at Northland breeding sites.

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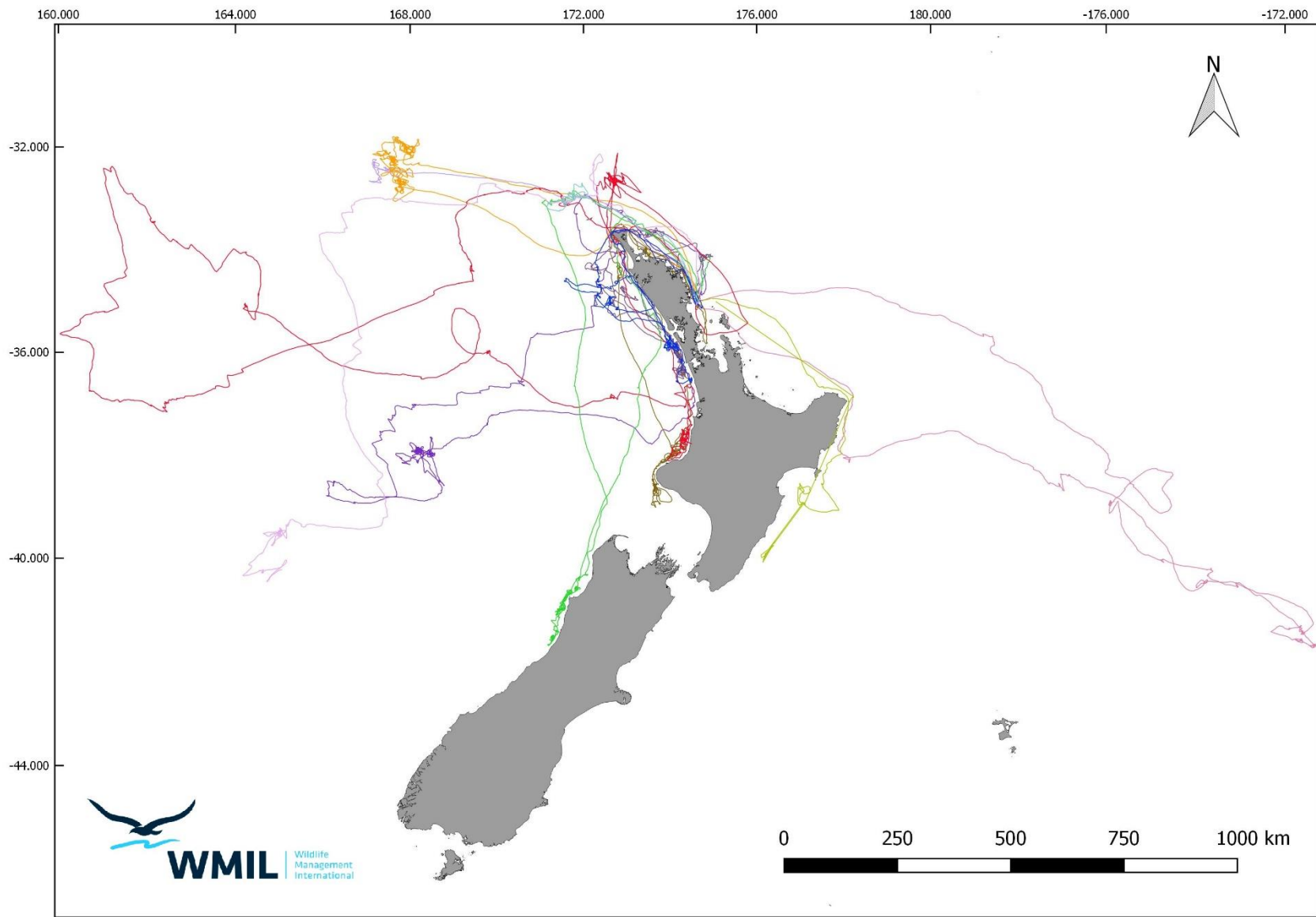
Lady Alice Island tracking



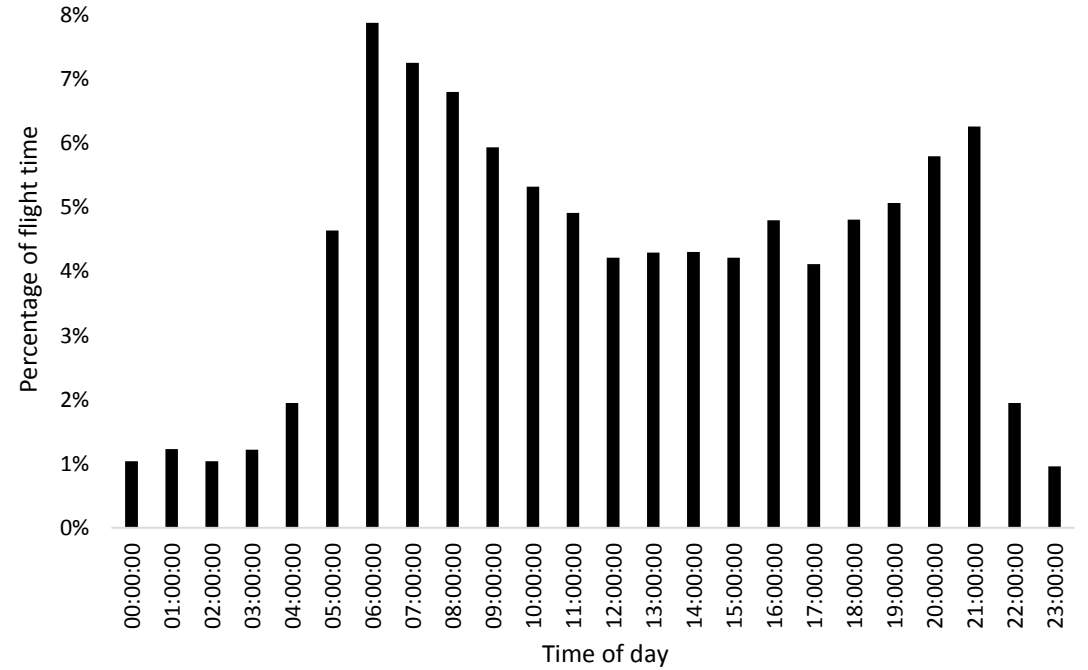
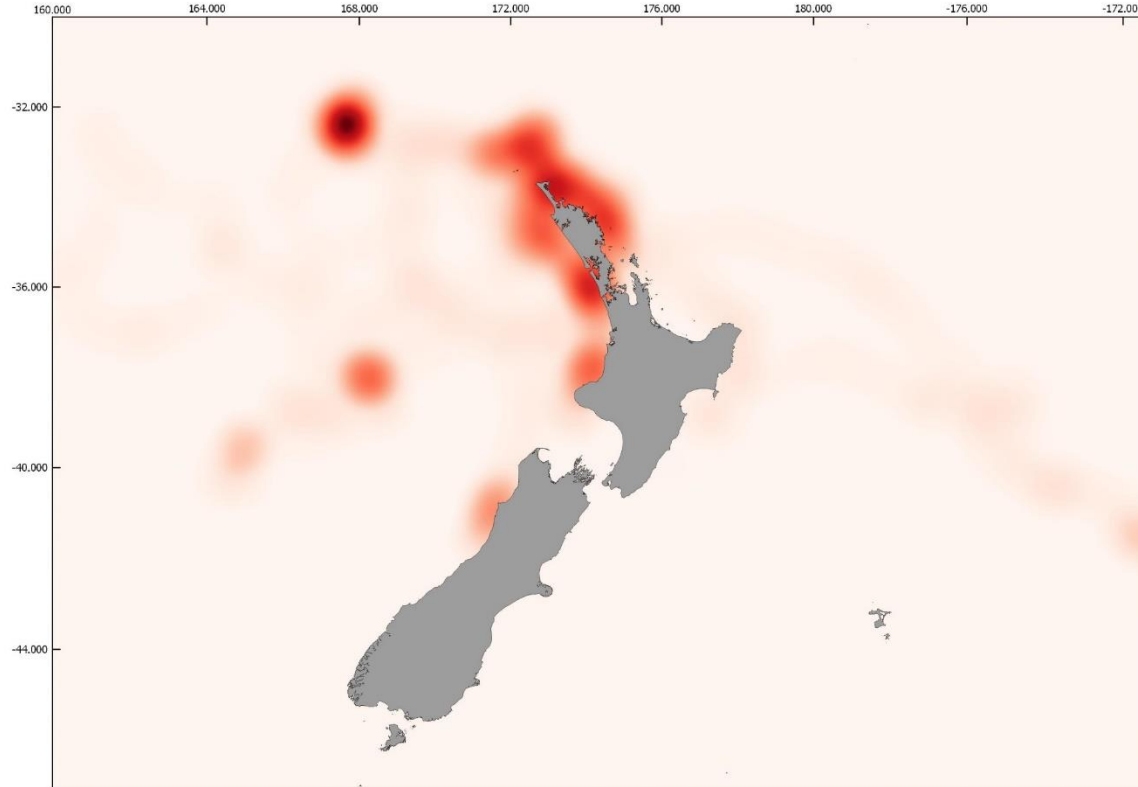


Wildlife Management International Ltd

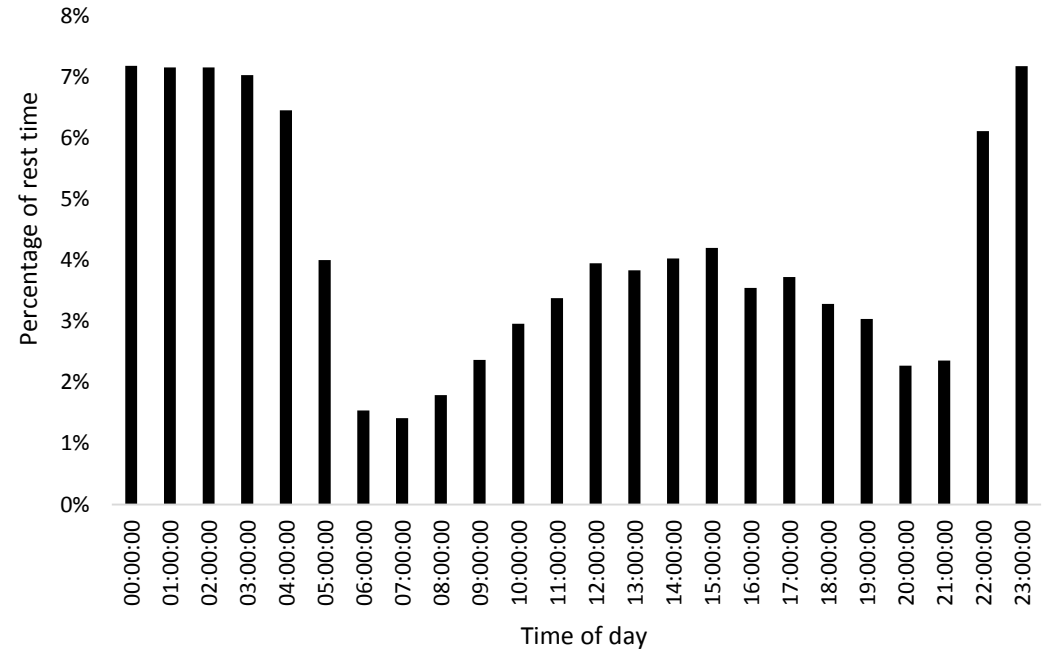
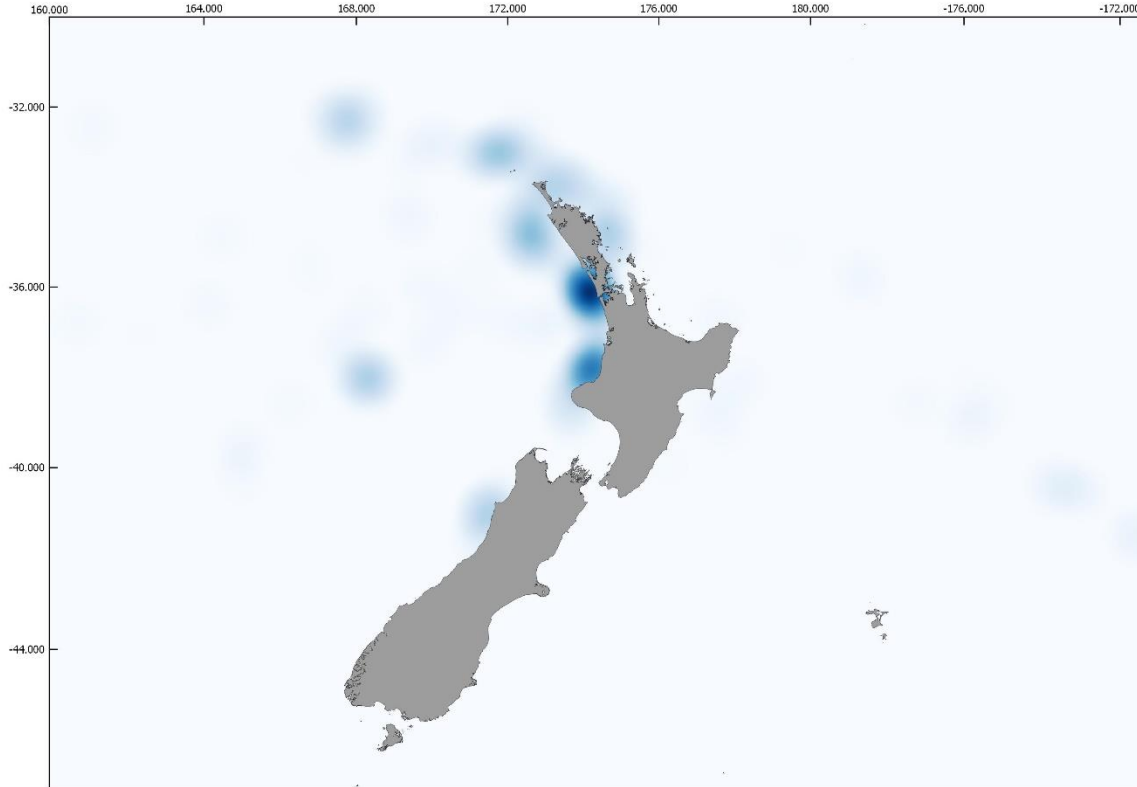




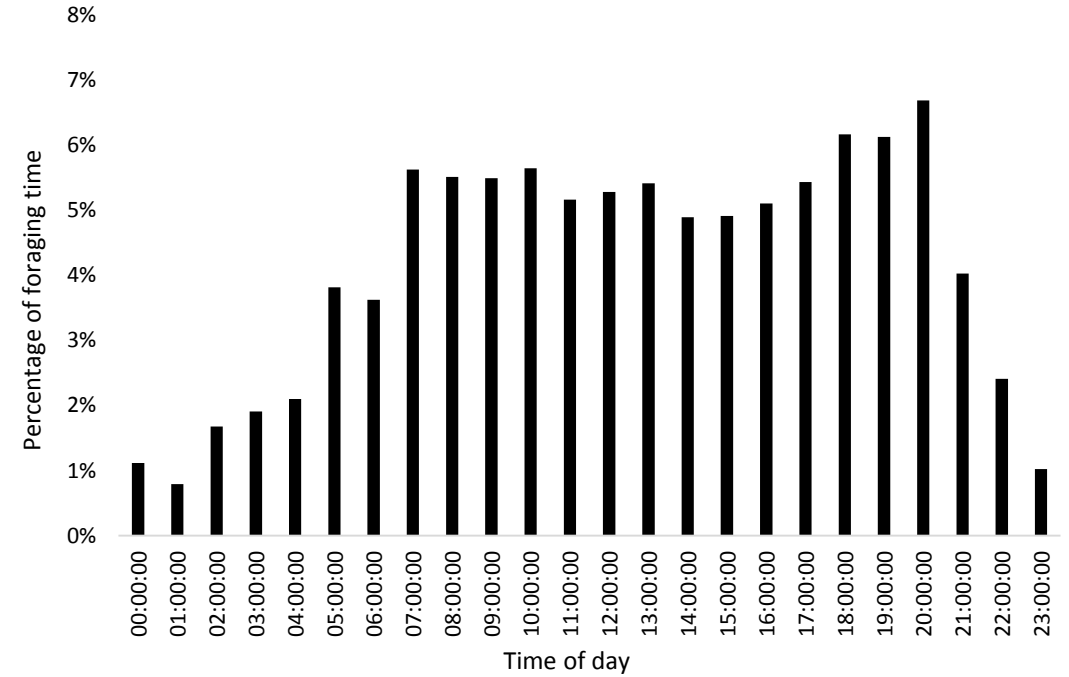
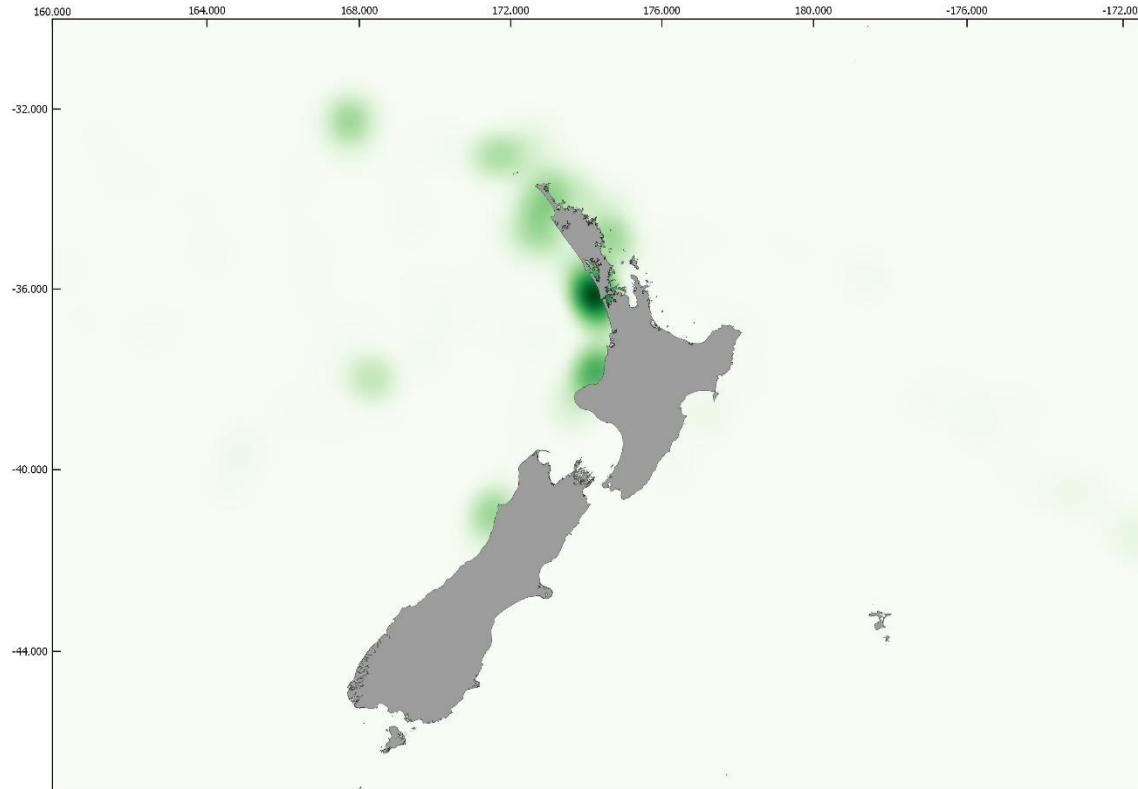
Flight – 40%



Rest – 47%

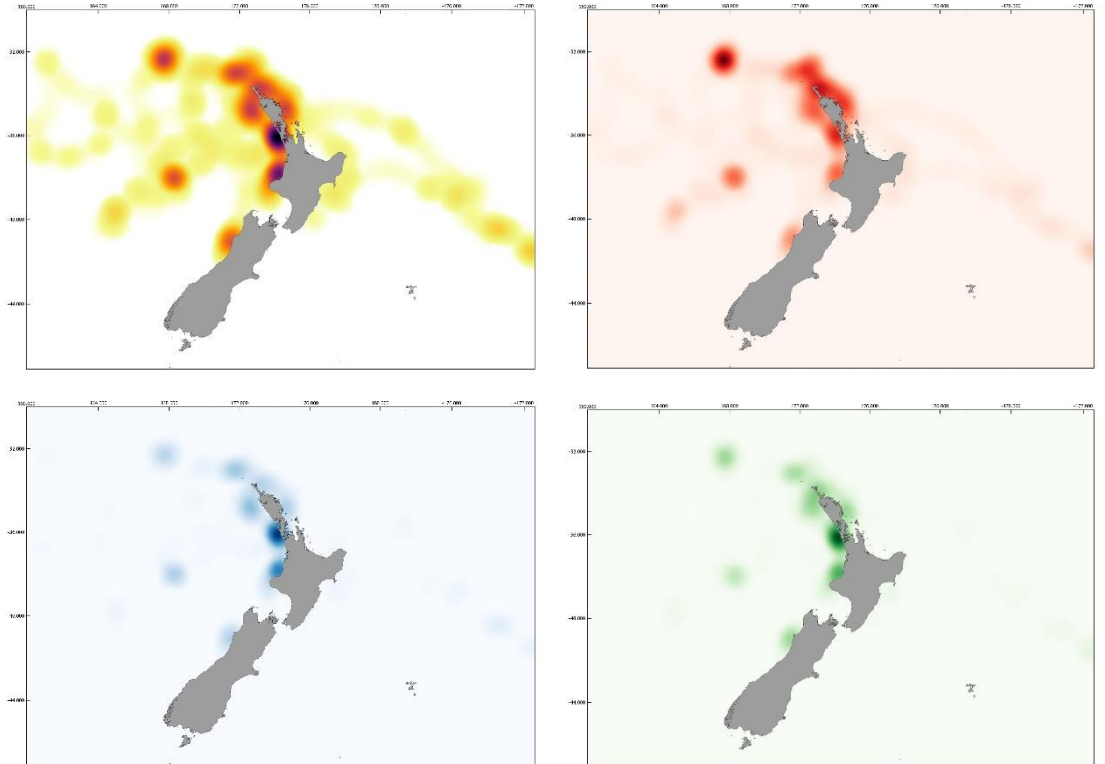


Forage – 13%



Summary

- Incubation shifts and foraging trips longer than expected
- Incubating FFSW from Lady Alice show a more westerly tendency
- Most foraging occurring in daylight



Project Objectives

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Population monitoring Ohinau and Lady Alice Islands



Burrows Monitored

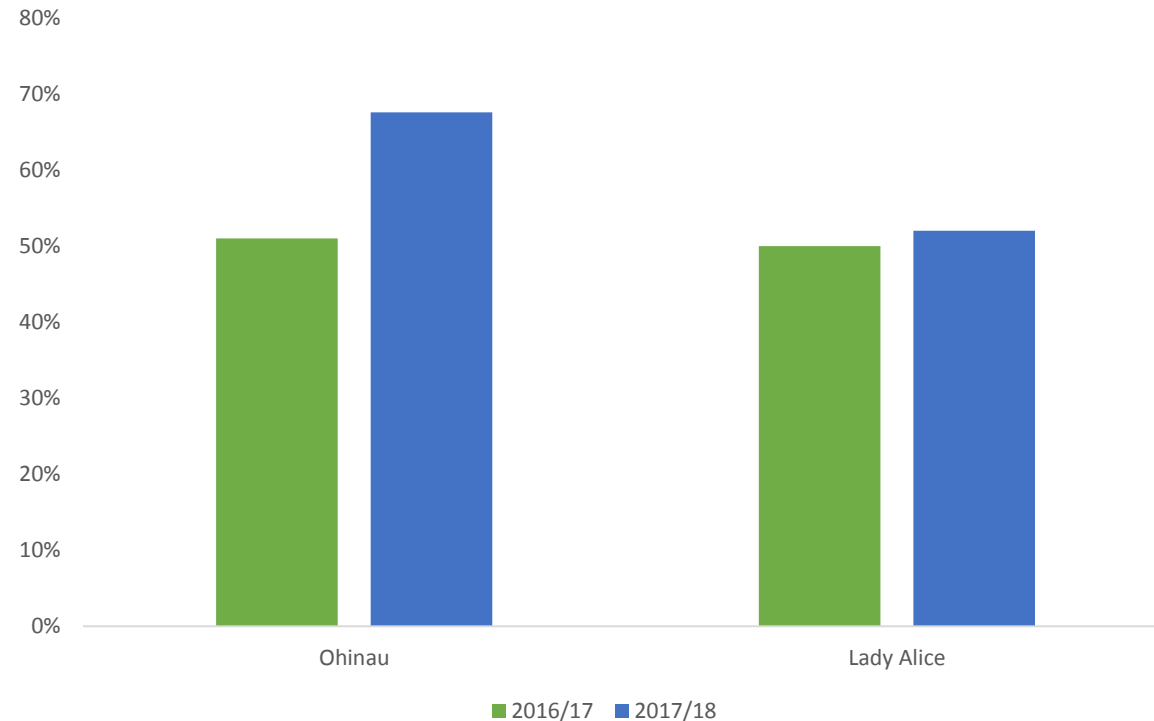
Ohinau Island			
	2015/16	2016/17	2017/18
Study	186	229	228
Burrowscope	32	36	44
Total	218	265	272

Lady Alice Island			
	2015/16	2016/17	2017/18
Study	0	198	230
Burrowscope	0	30	36
Total	0	228	266

- Both partners ID in 88% of burrows on Ohinau and 98% of burrows on Lady Alice Island.
- One partner ID in 9% Ohinau and remaining 2% Lady Alice

Breeding Success

- Ohinau 68%
- Lady Alice 52%
- Control burrows lower on both islands
- Chicks significantly heavier and with longer wings on Ohinau Island
- Difference explained by different foraging areas and La nina conditions?



Banded birds

Ohinau	2015/16	2016/17	2017/18	Total
Adult	90	528	182	800
Chick	267	133	131	531
Total	357	661	313	1331
Lady Alice	2015/16	2016/17	2017/18	Total
Adult	0	285	163	448
Chick	0	94	83	177
Total	0	379	246	625
			Total banded during this study	1956

Recaptured Birds

- 81% of birds identified as breeding in 2016/17 were found to be breeding again in 2017/18
- Most birds breeding every season - 75% of burrows have been bred in for three consecutive seasons on Ohinau
- 100 of 801 birds banded on Lady Alice between 2000-09 have been resighted
 - 31 banded as adults in 2000

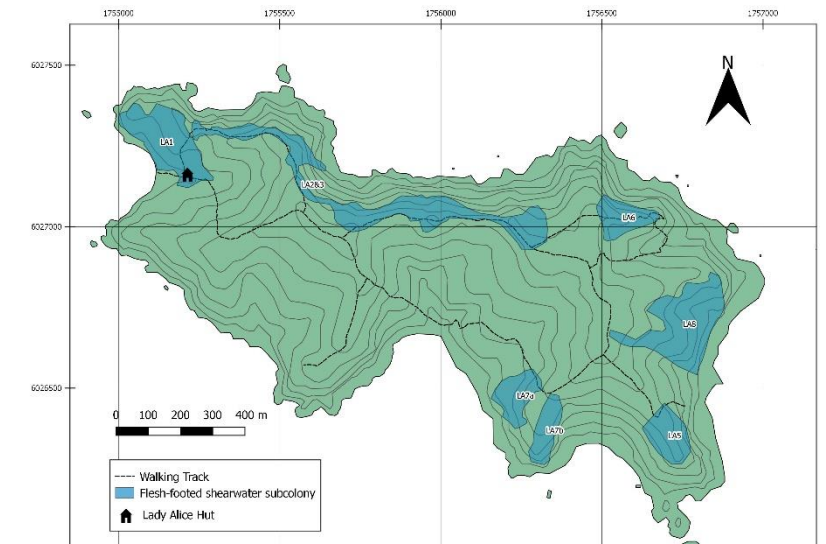
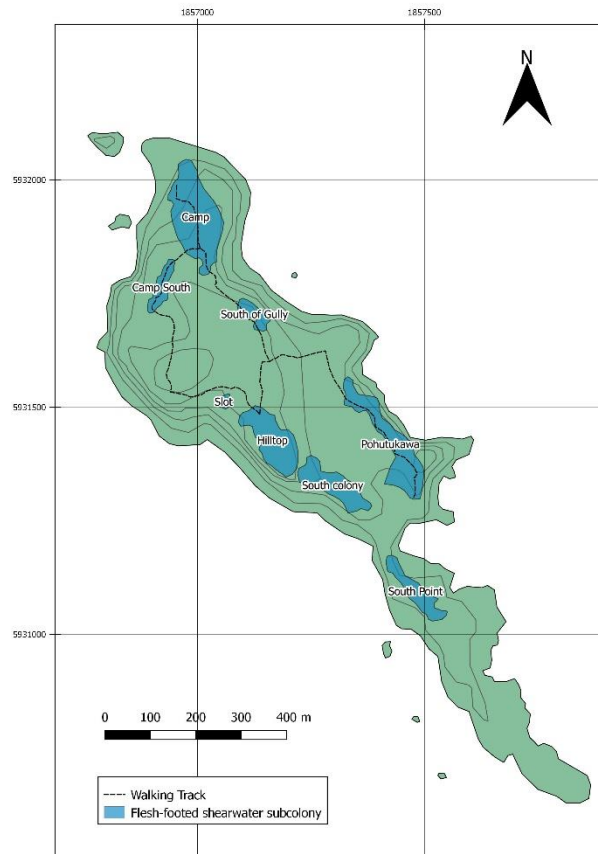


Summary



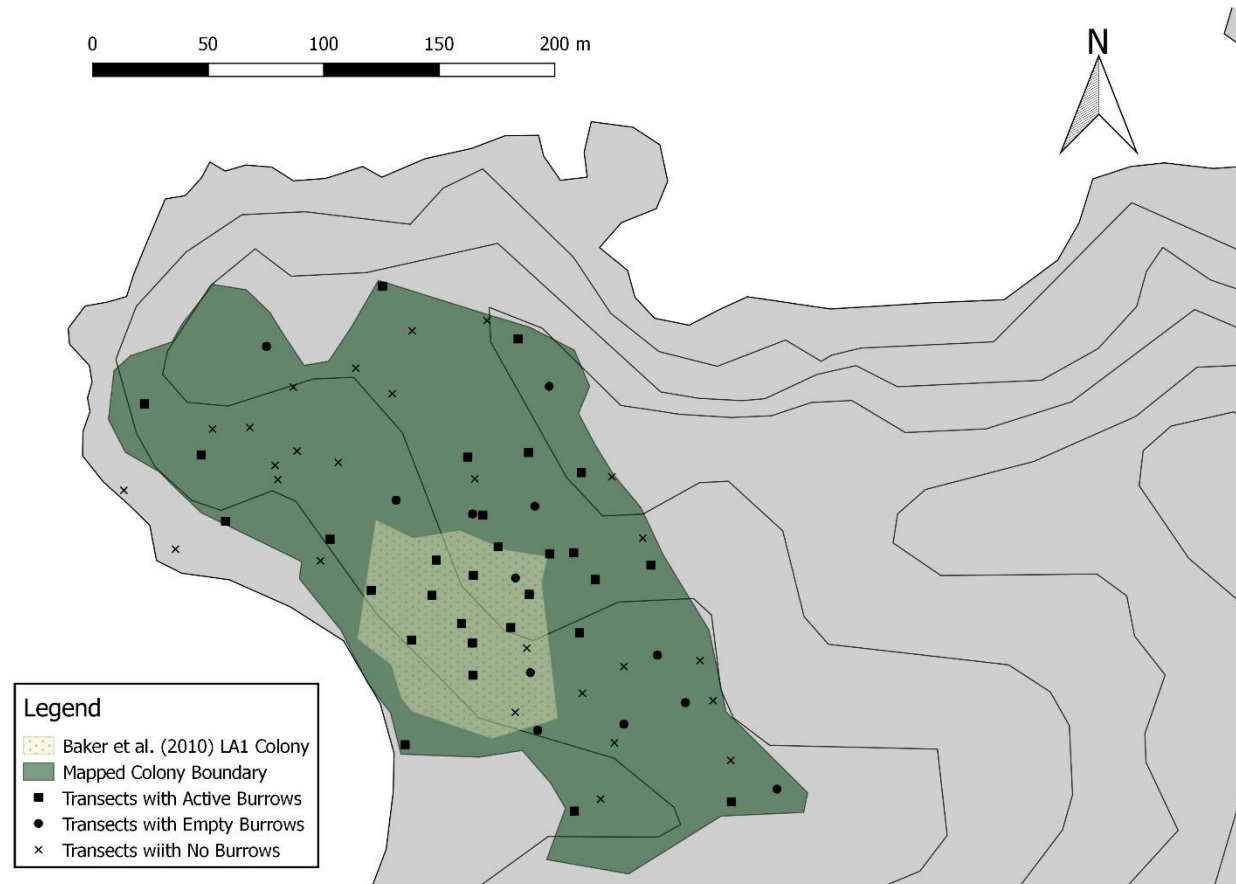
- Solid base established for long-term monitoring
- Difference in breeding success this season possibly explained by different foraging areas and effect of La nina
- Further monitoring warranted for determining breeding success, survivorship, age at first breeding

Flesh-footed Shearwater Population Surveys



Lady Alice LA1 Colony Estimate

Total Transects	68
Total Burrows	124
Burrows with contents checked	124
Occupancy	0.49
Area Sampled (m ²)	2720
Burrow density (burrows/m ²)	0.0456
Calculated Area 3D (m ²)	39000
Potential Burrows	1778
Estimated Occupied Burrows	867
95% confidence interval	628 - 1107



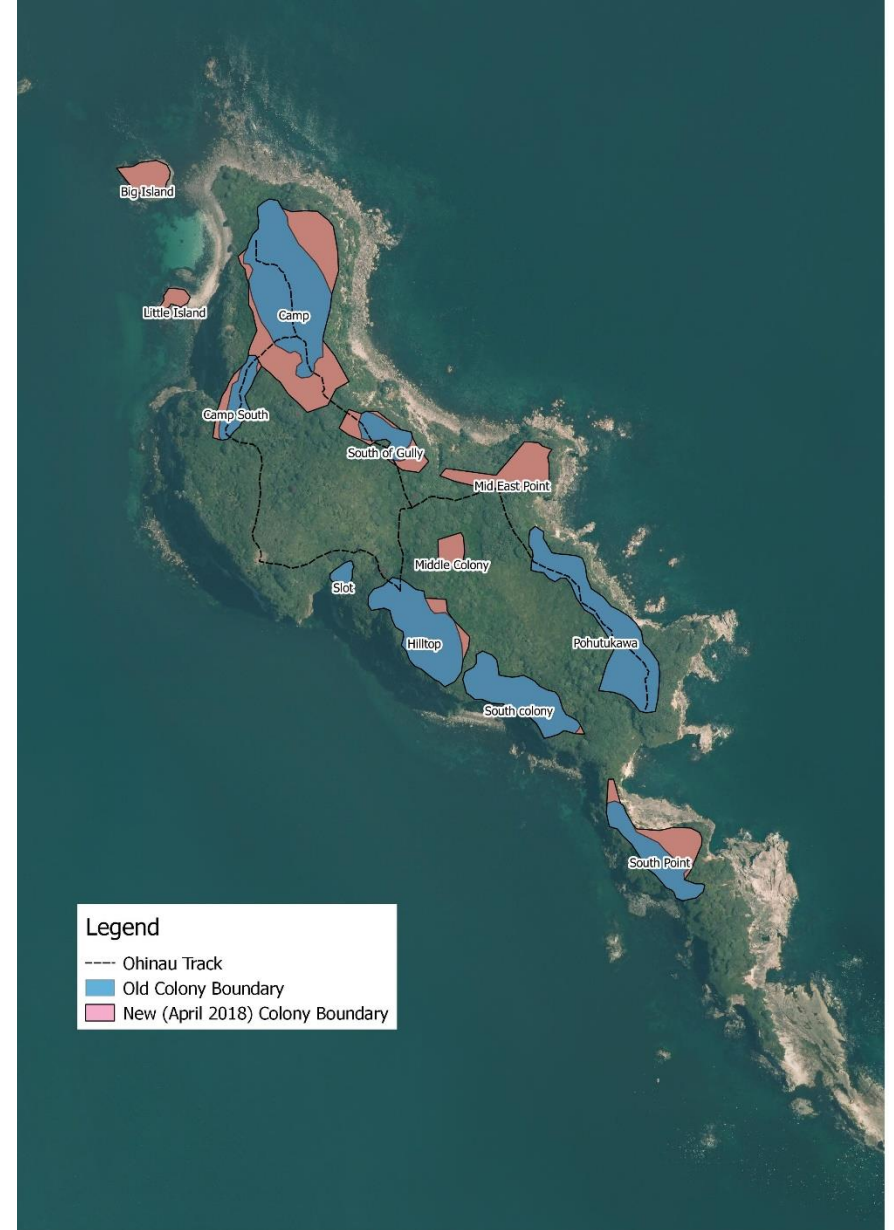
LA1 Colony Only		
WMIL 2018 Estimate		
95% Lower	Occupied Burrows	95% Upper
628	867	1107

LA1 Colony Only		
Baker <i>et al.</i> (2010) Highest Estimate - 2008/09		
95% Lower	Occupied Burrows	95% Upper
98	105	113

Lady Alice (entire island)		
Baker <i>et al.</i> (2010) Lady Alice Entire Island 2007/08		
95% Lower	Occupied Burrows	95% Upper
237	921	1605

Ohinau Island Estimate

Total Transects	69
Total Burrows	247
Burrows with contents checked	242
Occupancy	0.4612
Area Sampled (m ²)	2775
Burrow density (burrows/m ²)	0.0890
Calculated 3D Area (m ²)	97609
Potential Burrows	8688
Estimated Occupied Burrows	4007
95% confidence interval	3044 - 4791



WMIL 2018 Ohinau Island Estimate		
95% Lower	Occupied Burrows	95% Upper
3044	4007	4791

Baker <i>et al.</i> (2010) Ohinau Island 2008/09 Estimate		
95% Lower	Occupied Burrows	95% Upper
943	2071	3200

Overall Summary

- Tracking has shown different foraging areas for different breeding stages
- Better breeding success on Ohinau this season, same breeding success on Lady Alice
- Require long-term monitoring for more robust estimates of demographic parameters
- Flesh-footed shearwater populations in NZ may be larger than previously estimated



Acknowledgements

This project was funded by the Conservation Services Programme, Department of Conservation project POP2015-02, partially through a levy on the quota owners of the relevant commercial fish stocks. **Special thanks to:**

- Richard Brown, Giselle Eagle, Dan Burgin, Kailash Willis, Danielle Butler and Paula Harborne **for assisting with fieldwork**
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- Trev Jackson, Gary Stirling and Les Pickford **for transport to and from the Islands.**

