Trip report to DOC Murihiku:
Bounty Islands seabird and fur seal research
Proclamation Island

22 October 2019 – 1 November 2019

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Introduction

Six researches travelled to and conducted biological research on Proclamation Island at the Bounty Islands 22 October 2019 – 1 November 2019. Research work focused on Salvin's albatross, New Zealand fur seals, erect crested penguins and Fulmar's prion. The six researchers, and their respective focus, were:

- Graham Parker and Kalinka Rexer-Huber; Salvin's albatross (Parker Conservation)
- Paul Sagar; Salvin's albatross (NIWA)
- Thomas Mattern; erect rested penguin (Eudyptes Consulting)
- Alan Tennyson; Fulmar prion (Te Papa)
- Paige Green; erect crested penguins, Salvin's albatross (University of Tasmania)

Transport to and from the islands was with *Evohe*, skippered by Jim Dilley with five crew (total of twelve personnel).

Itinerary

October 20: research team arrived in Invercargill late afternoon

October 21: research team gear quarantined, trip briefing, travel to Dunedin and load *Evohe*

October 22: research team onboard *Evohe* at 9 am, depart for Bounties shortly after

October 23: *Evohe* traveling to the Bounty Islands

October 24: *Evohe* arrive at the Bounty Islands 8 am. NW wind up. Ashore at Proclamation at 14:40, back to Evohe at 19:00. *Evohe* anchor overnight off of Proclamation Island, outside Bucket Cove.

October 25: *Evohe* stayed on anchor all day. Ashore 08:00. Paige, Alan, Tom, Paul back to Evohe at 17:00. Kalinka, Bill and Graham return to vessel at 19:00. *Evohe* anchor overnight off of Proclamation Island, outside Bucket Cove.

October 26: Ashore at 08:10. Return to vessel at 18:00. Overnight *Evohe* moved to south side of Lion Island due to NW wind, and maintained station without anchoring.

October 27: Checked landing from *Evohe* after breakfast and due to forecast wind increase, and current swell size, did not attempt to land. *Evohe* to sea for the day, with NW swell building.

October 28: *Evohe* steamed back to Proclamation Island and first light. The landing was checked from *Evohe* at 06:00, 08:15 and 10:15. Swell too large to land, but conditions allowed anchoring at 10:30. Wind calm and swell abated sufficiently by 14:30 to allow a shore party to land. Back on board at 18:50. *Evohe* anchor overnight off of Proclamation Island, outside Bucket Cove

October 29: Ashore at 08:15, return to the *Evohe* at 16:00. After dinner, anchor up and steaming to Dunedin.

October 30: *Evohe* travelling to Dunedin

October 31: *Evohe* travelling to Dunedin

November 1: *Evohe* arrived Dunedin at approximately midday

Biosecurity

All personal clothing and project equipment went through DOC biosecurity in Invercargill prior to departure. This included inspection of all items by a rodent dog. The rodent dog also inspected the vessel *Evohe* prior to departure from Dunedin.

Once at the island, only equipment and clothing that had been through DOC quarantine was taken ashore. DOC biosecurity protocols were followed daily before departing the vessel. This entailed boot and lower rain-pant leg washing with Tri-gene disinfectant. All items taken ashore were returned to the boat. Several crew went ashore. Crew were briefed by the expedition leader (Graham Parker) and their clothing and gear (daypacks) quarantined by Kalinka Rexer-Huber.

Brief summary of research conducted

Salvin's albatross

The Conservation Services Programme, Department of Conservation, commissioned NIWA to estimate the population size of Salvin's albatross at the Bounty Islands. Parker Conservation and Paul Sagar conducted fieldwork for NIWA in both 2018 and 2019 visits to the Bounty Islands. The specific elements of the project undertaken by NIWA were:

- Geolocator (GLS) deployment in year 1 (2018), with trial PTT/GPS device deployment
- Retrieval of GLS devices and deployment of additional PTT/GPS devices in year 2 (2019)
- Band and resight previously banded birds with the potential to establish a study site area on Proclamation Island (the island with easiest access and most historical data)
- Transect counts to ground truth aerial photographic survey by aeroplane (year 1 only)
- Deployment of six time-lapse cameras to record breeding phenology and breeding success rates in the Salvin's albatross study colony (2018), and retrieval of cameras (2019)

This work was undertaken under the Management Related Entry to Nature Reserve Tracking Document M1819/04. NIWA will provide a full report detailing this project to the Department of Conservation, Conservation Services Programme (DOC CSP). Summary reports of Salvin's albatross research and aerial photography to DOC CSP from the 2018 visit to Bounty Islands are located here:

https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-conservation-services/reports/pop2017-03-bounty-islands-ground-component.pdf

https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-conservation-services/reports/pop-2017-03-salvins-albatross-bounty-islands-aerial-component.pdf

New Zealand fur seal

The Conservation Services Programme, Department of Conservation, commissioned Parker Conservation to examine existing information on fur seal observations (i.e. aerial photos and ground counts) to determine their suitability for estimating the population trend of fur seals and make recommendations on future data collection that may allow a better assessment of fur seal population size and trend in the Bounty Islands area.

Included was assessing the feasibility of estimating the population size of fur seals at the Bounty Islands through aerial surveys conducted by UAV (un-personed aerial vehicle).

We aimed to test whether aerial surveys to quantify NZ fur seal population size can be conducted with a drone at the Bounty Islands without adversely affecting wildlife there. The trial had three parts:

- Disturbance: Flight characteristics (flight speed, height, time of day) trials to find the combination that causes least disturbance.
- Suitability: Using the flight characteristics that cause least disturbance, programmed grids flown and ground-truthing conducted to test the accuracy of counts from aerial photographs.
- Accuracy: Images of suitable quality for fur seal detection stitched, counted, and counts checked for accuracy against ground-truthing data.

Animal responses were most marked during takeoff and landing, with fur seals in the immediate vicinity of the launch area (<20m) sitting up and watching the drone (larger animals) or walking into rock crevices (smaller animals). We saw no fleeing or mass movements/stampede. Restless movements by seals eased as the drone gained height. Once the drone was above ~8-10m, animals lay back down; hover at 10m caused continued watching, but no further movement; and hover at 20m appeared largely ignored.

Seabirds on the ground near takeoff/landing showed much less response than seals. Albatrosses and penguins within ~5m cocked heads to watch the drone but with little shift in body position, and once above ~5m the drone was largely ignored.

Seabirds in flight were clearly able to detect and avoid the drone during standard takeoff/landing (head movements seen, no near misses/close calls). Slower and faster ascent speeds made little apparent difference to drone detectability, but we took care to avoid erratic movements and fast acceleration/deceleration to help flying seabirds adjust their flightpath if need be. Air traffic appeared greatest around the perimeter of the islands and thinnest over the tops of the islands, forming a bird halo.

Animal response trials were conducted on two separate occasions, from mid- to late afternoon and from early- to mid-afternoon. Further monitoring also covered flights over the middle of the day. There was no indication that time of day influenced how animals reacted to drone operations. Flight activity was expected to be lower during the middle of the day, but on this visit was more clearly linked to passing frontal systems. Air traffic was minimal on response trial days and increased notably following a NW front. However, even when the skies were busier, continued monitoring of takeoffs/landings showed no problems for seabirds detecting the drone in the 10-15m of busy airspace capping the islands.

Horizontal flight at 40m, 60m and 80m above takeoff point obtained reactions only from gulls, who occasionally approached the drone, flying in loose circles below and calling but not approaching closely. This occurred at all flight heights, speeds and times of day. If the drone continued horizontal flight (ie. away from the site where gulls had first approached), gulls followed briefly then appeared to lose interest. Stationary hovering and vertical ascent/descent also eventually caused gulls to lose interest, but this seemed to take longer.

Parker Conservation will provide a full report detailing this project to the Department of Conservation, Conservation Services Programme (project POP2019-05: NZ fur seal: Bounty Islands population assessment).

Erect crested penguin

Summarised here by Thomas Mattern, New Zealand Penguin Initiative, t.mattern@eudyptes.net

Ground counts of Erect-crested penguins, Proclamation Island, 25-26 & 28-29 October 2019

Erect-crested penguin numbers on the Bounty Islands

The Bounty Islands are one of the two main strongholds of the Erect-crested penguin. Due to difficult logistics of visiting and particularly landing on the Bounties, there is only very limited information on the species' abundance and population size.

To date, estimates of penguin numbers have been attempted three times; in 1978 (Robertson & van Tets, 1982), 1997 (Clarke, Booth & Amey, 1998), and 2004 (De Roy & Amey, 2004).

The 1978 estimate is based on a rather crude extrapolation of penguin nest density of 0.9 nests / m^2 to the assumed suitable area of eight islands believed accessible to penguins. The resulting figure suggested that there were nearly 115,000 breeding pairs of Erect-crested penguins, of which 15,580 pairs were suggested to exist on Proclamation Island (Robertson & van Tets, 1982).

A full count of Proclamation Island was conducted between 12 and 16 November 1997 (Clarke, Booth & Amey, 1998). The survey chose a more systematic approach by dividing the entire island into 8 counting blocks (Fig 1). Within each block, every nest containing an egg or chick was counted and marked with stock marker (raddle) to prevent double counts. Additionally, non-breeding birds were counted and, if possible, marked with raddle. A total of 2,743 Erect-crested penguin nests were counted, a figure that was then adjusted to account for missed nests to 2,774 nests still active when the count was conducted. The survey derived an average nest density of 0.2 nests / m² (Taylor, 2000).

The discrepancy of nearly 13,000 pairs between the 1978 estimate and the 1997 counts could suggest a substantial decline in penguin numbers over the 1980s and 1990s. A decline of Erect-crested penguin numbers on the Antipodes are believed to have occurred during the same period. However, different methodological approaches limit the usefulness of direct comparisons between the two estimates (Taylor, 2000).

Between 16 and 23 November 2004, penguin numbers on Proclamation Island were counted again, using the same methods as in 1997 (De Roy & Amey, 2004). A total of 2,717 (adjusted numbers 2788) nests were recorded – a mere 31 nest difference from the previous survey – suggesting that the penguin population had remained stable.

Following the methods used during the last two surveys, I determined the number of Erect-crested penguin nests on Proclamation Island during four days of counting between 25 and 29 October 2019.

Ground counts

Erect-crested penguin nests were counted in the eight counting blocks established by Jacinda Amey in 1997 and GPS mapped in 2004 (Fig 1). Block boundaries were loaded to a handheld GPS receiver (Garmin GPSMAP 64s) and used to limit counts to each respective block. Only active nests were counted where either a pair of birds or single penguins were brooding an egg. Each counted nest was marked with a dot of blue raddle (Fig 2).

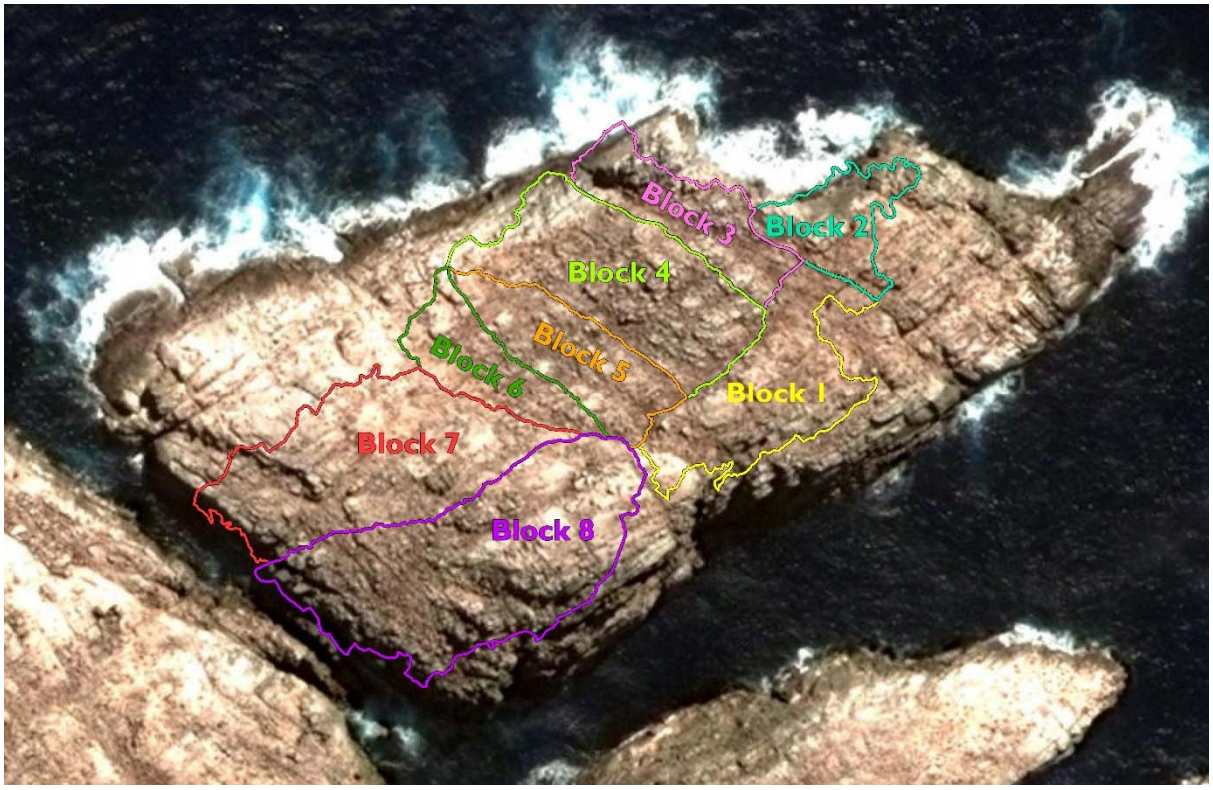

Fig 1. The counting blocks used in the 1997, 2004 and the 2019 Erect-crested penguin counts.

Blocks 3 and 4 were counted on 25 October between 1000 and 1730hrs. Blocks 5, 6 and 7 were counted on 26 October between 0930 and 1700hrs. Northerly winds prevented landing on Proclamation on 27 October so that counts resumed only in the afternoon of 28 October. Block 8 was counted between 1530 and 1900 hrs. The survey was concluded on 29 October with the counting of penguin nests in blocks 1 and 2 (1000-1330 hrs).

Fig 2. Erect-crested penguin and Salvins albatross nests in Block 5. Note the raddle dots next to penguin nests.

The combined counting time across the four survey days amounted to 22 hours.

A total of 2,867 Erect-crested penguins were counted which is 150 nests up from the 2004 and 93 nests up from the 1997 census.

However, this survey was conducted two to three weeks earlier than the previous counts. As further nest failures likely occurred in the days and weeks following this survey, the higher nest numbers are unlikely indicative of a population increase.

Instead, penguin numbers on Proclamation Island appear to have remained stable since 1997.

Outlook

Drone imagery recorded on 28 and 29 October of Proclamation Island provide a detailed overview of the penguins, albatross and seals on Proclamation Island (Fig 3). Additional imagery was obtained from other islands as well. Using the nest count on Proclamation for ground truthing, the drone imagery provides an additional data layer to estimate the population size of Erect-crested penguins on the Bounty Islands.

Analysis of the data is ongoing; a detailed account of the penguin census using all available data is in preparation for publication in *Notornis*.

Fig 3. Composite imagery of Proclamation Island recorded with a Mavic 2 Pro camera drone on 28 October 2019; subsection indicates level of detail of the imagery to be used for penguin counts.

Erect crested penguins and Fulmar prions

Summarised here by Alan Tennyson, Museum of New Zealand Te Papa Tongarewa, P.O. Box 467, Wellington

Candling of erect-crested penguin eggs to determine breeding period

It has been noted that erect-crested penguins at the Bounty Islands may lay 'considerably' later than this species at the Antipodes Islands (Robertson & van Tets 1982). Such a difference would affect comparisons between surveys of the species at these different island groups. Robertson & van Tets (1982) estimated that eggs at the Bounties had been laid about 28-31 Oct, with single 'B' eggs being incubated on 7 Nov and no hatching by 20 Nov. De Roy & Amey (2004) saw the first chick on 22 Nov 2004 with many more the next day and estimated that laying commenced on 13 Oct. However, Clark et al. (1998 & unpubl. data) reported an egg on 5 Oct and 3 more on 6 Oct and only single ('B') eggs being incubated in all (but 1) nests by 1 Nov; on 17 Nov they found 1 egg pipping; on 12 Dec all eggs had hatched.

On Antipodes Islands eggs have been reported from 2 Oct (Tennyson & Taylor, unpubl.). Moors (1980) noted that hatching began about 14 November 1978. Robertson & van Tets (1982) noted that eggs hatched from about 15-24 Nov. In 1995 hatching occurred from about 12-24 Nov (Tennyson & Taylor, unpubl.).

To investigate the potential discrepancy in breeding timetable between the Bounty and Antipodes Islands, our work programme included "A sample of erect-crested penguin eggs will be assessed (by candling) to check laying date synchrony with penguins at Antipodes Island".

To assess embryo development, on 26 Oct Thomas Mattern and I attempted to candle the larger 'B' eggs being incubated by penguins using both a strong torch light in darkness and by looking through a tube held to the sunlight, however, neither technique allowed us to see the stage of development within the eggs. The same techniques were successful in being able to see embryo development in albatross eggs. Penguin eggshell appeared too thick for these techniques to work in the field, especially when the eggs were also covered in mud.

Nevertheless, the timing of laying could be determined to some degree, because nearly all occupied penguin nests on 24-29 Oct contained only the 'B' egg and had a pair of adults present, indicating

that laying had been completed. This timing is consistent with other observations at the Bounty Islands and is certainly earlier than the timing of laying estimated by Robertson & van Tets (1982). Laying of the first eggs on about 5 October on the Bounty Islands is well within the period (3-12 October) in which Miskelly & Carey (1990) estimated that 95% of first eggs would be laid on the Antipodes. Nevertheless, as pipping was seen on 17 November in 1997 on the Bounties and no eggs were seen to have hatched by 20 November in 1978, whereas many had hatched by 20 November on Antipodes in 1978 (Robertson & van Tets 1978), the Bounty's timetable appears to be about a week later.

Fulmar prions

Genetic research by Te Papa researchers and collaborators indicates that the fulmar prions nesting on the Bounty and Snares Islands are a distinct species from other fulmar prions found at the Chatham and Auckland Islands.

This trip provided "an opportunity (using observations onshore and from Evohe) to record the presence of this species on each of the islands/stacks in the Bounty group", allowed "measurements of nest density to be determined" and allowed "a series of basic morphometric measurements for comparison with prions from other populations" to be collected.

My objective was to add to the small base of information known about their morphology, breeding cycle and numbers.

Measurements

Although prions at the Bounty Island have been measured previously, such measurements are known to vary between observers, so it is important to minimise these differences when comparisons are made by having the same person measure birds. I set out to measure 10 prions of each sex but an initial bias towards catching males resulted in me measuring 12 males and 10 females (Table 1). Sex was determined by cloaca size and presence of a palpable egg in the abdomen (laying was underway during our visit 24-29 Oct). As expected, based on other procellariforms, males averaged larger than females.

Table 1. Culmen length = Cul; depth at bill base = Dep; width at bill base = Wid; unguis width = Ung Wid; depth at unguis = Ung Dep; wing length as straightened chord = Wing; tail length = Tail; tarsometatarsus = Tmt; middle toe + claw = MTC; weight (g) = Wt.

Females	Cul	Dep	Wid	Ung Wid	Ung Dep	Wing	Tail	Tmt	MTC	Wt
1	22.9	12.0	11.6	5.8	9.0	187	90.2	34.1	41.8	199-19=180*
2	21.5	11.0	10.2	5.4	8.5	190	100.9	34.4	41.4	212-19=193*
3	22.8	11.5	11.2	5.6	9.1	180	96.1	33.8	42.4	195-19=176*
4	22.5	11.5	10.9	6.3	9.0	186	89.0	34.2	45.5	199-20=179*
5	22.4	12.2	10.9	5.3	9.8	179	90.2	33.7	42.7	171-21=150
6	22.6	10.3	11.1	5.8	8.7	184	97.0	33.7	44.0	158-23=135

7	22.0	11.9	11.2	5.3	9.2	193	95.0	34.1	40.4	203-23=180*
8	22.4	11.6	10.9	6.2	9.1	197	100.0	33.6	41.1	171-23=148
9	22.4	11.7	11.3	5.4	8.5	187	95.7	34.2	42.0	177-23=154
10	21.8	11.4	11.2	5.5	8.9	187	88.2	32.2	41.1	175-23=152
Mean	22.33	11.51	11.05	5.66	8.98	187.0	94.23	33.80	42.24	147.80
1 S.D.	0.44	0.54	0.37	0.36	0.38	5.46	4.57	0.62	1.52	7.50

Males	Cul	Dep	Wid	Ung Wid	Ung Dep	Wing	Tail	Tmt	MTC	Wt
1	21.7	11.8	11.2	5.8	8.9	183	97.2	34.3	41.4	180-19=161
2	22.9	12.1	11.7	5.7	9.2	181	95.1	33.8	42.1	176-19=157
3	22.1	11.8	11.4	5.4	9.4	188	95.4	33.5	40.2	173-20=153
4	22.9	11.4	11.3	6.0	9.7	185	90.0	34.5	43.6	181-20=161
5	24.2	11.8	11.8	6.2	9.7	196	93.9	35.2	44.4	171-20=151
6	22.5	12.5	11.8	6.4	9.5	189	88.0	33.3	43.9	171-21=150
7	23.5	11.6	11.6	5.9	9.4	182	95.1	34.2	43.0	191-21=170
8	22.1	10.9	12.3	5.2	8.7	192	100.6	34.5	42.8	167-21=146
9	23.9	13.3	12.4	6.5	10.1	186	91.1	34.7	42.8	175-21=154
10	25.1	12.5	12.6	6.3	10.0	192	90.3	34.7	42.6	157-21=136

11	24.5	12.8	11.7	5.8	10.1	191	93.3	34.6	45.8	194-21=173
12	24.3	11.8	11.9	5.1	9.3	191	91.5	34.1	44.1	183-21=162
Mean	23.31	12.03	11.81	5.86	9.50	188.0	93.46	34.28	43.06	156.17
1 S.D.	1.10	0.66	0.44	0.46	0.45	4.65	3.51	0.54	1.46	10.21

* palpable egg in abdomen, so the mean weight is based only on the weight of the other 5 females

Breeding cycle

Surprisingly few prions were ashore when we landed on Proclamation Island on 24 Oct from 1450-1900 hours. Despite walking over about half the island, I saw only four prions sitting (on eggs), less than 10 flying about over the island, and none sitting on surface rocks. Numbers of prions ashore increased notably each subsequent day as our trip progressed (ashore on 25 Oct, 26 Oct, 28 Oct & 29 Oct), with dozens always visible on surface rocks by the end of the trip. These observations suggested that laying had just begun on 24 Oct and that a pre-laying exodus explained the lack of birds ashore when we first arrived. This agrees with previous observations on the breeding timetable at the Bounties. Paul Sagar noted that laying had not been completed during his visits in October 2012, 2013 & 2018. He recorded no fulmar prion eggs during landings on Proclamation Island on 16 and 17 October 2012, but fulmar prions were on apparent fresh eggs on 21-23 October 2013 and 22 October 2018 (Paul Sagar, pers. com). In 1997, Clark et al. (1998) found 20 eggs that had already been laid when their study began on 29 Oct; laying continued until 7 Nov; hatching occurred on 14-26 Dec. In 2019, two nests checked that had incubating females one day had the males incubating the following day. This is typical of procellariforms, where males immediately begin incubating after the female has laid.

Population survey

It was evident from the laying activity during our visit that our trip was too early in the season to provide a reasonable population density/estimate of this species. On 28 Oct, I counted the number of prion nests in a 5m x 5m area that had a relatively high density of prion nests. I based myself in this area measuring prions, so was able to conduct a thorough examination of the site. This quadrat contained 18 incubating prions (as well as 5 incubating Salvin's albatrosses, 1 empty albatross nest, 6 incubating penguins and 1 penguin pair by an empty nest; each penguin nest with an egg contained only the larger 'B' egg and, apart from one single adult, had a pair of birds present). With prion laying evidently continuing well after our visit, it seems certain that prions on the Bounty Islands can nest at a density of at least one nest per square metre. Nests were so common in places that some incubating birds were nose-to-tail with the next incubating bird. Prion nests were all in rock crevices or under rocks, so their distribution roughly corresponded to the areas that penguins and albatrosses nested. However due to the much smaller size of the prions, it seemed that prions out-numbered those of both penguins and albatrosses.

In 1997, 1,235 prion pairs were estimated to occur on Proclamation Island, which is only about one third of the number of both penguins and albatrosses nesting on the island (Clark et al. 1998; A. Booth in Taylor 2000). My observations suggest that 1,235 is probably an under-estimate of the numbers of prions nesting on Proclamation Island. A lot of nests are hidden under rocks and in crevices inaccessible to researchers and I probably missed finding some hidden nests even in the 5m x 5m quadrat that I explored in detail. The survey in 1997 estimated prions to be nesting at an average of 0.21 breeding pairs per m^2 and occupying 139,354 m^2 of suitable nesting habitat across

the Bounty group (A. Booth in Taylor 2000). Further surveys at the end of the laying period (i.e. c.7 Nov) would be helpful, including ground-truthing nest density on other islands in the group.

On 29 Oct, Paige Green and I surveyed all the islands of the group from Evohe using binoculars. Although prions have previously been noted as being abundant and widespread at the Bounty Islands, there seems to be no list of the islands where they occur within the group. Previously summaries note "they formed a subterranean population wherever suitable habitat occurred" (Robertson & van Tets 1982), "Fulmar prions nest to a varying degree on all the otherwise populated islands …Castle Island was the only one of any size on which we never saw any prions" (Clark et al. 1998), and "Apart from the colony at Proclamation I., the distribution of nesting islands within

the Bounty Is group has not yet been reported" (Jamieson et al. 2016). Our observations confirmed that prions were widespread at the Bounty Islands; based on our 2019 observations, prions were nesting on 12 islands.

In 2019 prions were nesting abundantly on Proclamation Island. Prions were seen ashore, or circling rocks indicating that they were landing and nesting, on the following islands: Spider, Depot, Tunnel, Ranfurly, Lion, Penguin, Ruatara, Funnel, Coronet and Molly Cap. In addition, two prions flew over Prion Island, so it is likely that they also nest there. Given the widespread distribution of prions at the Bounties and the nesting density of prions on Proclamation Island, this suggests that prions out-number all other bird species at the Bounty Islands. In 1997, 29,354 prion pairs were estimated to occur on the Bounty Island group, which would make this species about equally as common as the erect-crested penguin and Salvin's albatross, according to 1997 estimates of those species at the Bounties (A. Booth, J. Amey & F. Schmechel in Taylor 2000).

The information collected on prions during this trip will be used in publications dealing with prion taxonomy and distribution in preparation by myself, Lara Shepherd and others.

Other bird observations

Our survey of the island group recorded the following distribution of species: prions on 12 islands, penguins, shags and gulls on 11, Salvin's albatrosses on 8, cape petrels on 5, Antarctic terns on 2, giant petrels and ?Arctic terns on 1 (Tables 2 & 3).

Table 2. Distribution of breeding birds on the Bounty Islands, based on 2019 observations

A = abundant, breeding or presumed breeding. C = common, presumed breeding. O = onshore, presumed breeding. F = few ashore, presumed breeding. R = rare ashore.

	Penguin	Albatross	Cape petrel	Prion	Shag	Antarctic tern
Spider	A	A		O	C	
Seal Rock	R					
Skua Rock						
Proclamation	A	A	F	A	F	F
Depot	A	A		O	F	
Tunnel	A	A	F	O	F	F

Ranfurly	O			O	C	
Lion				O	C	
Penguin	A	A		O		
Ruatara	F	A		O		
Funnel	F	A	F	O	A	
Prion	C		F	?O	C	
Coronet				O	C	
Castle						
North Rock	C				A	
Molly Cap		A	F	O	A	
Offshore	A	A	C	A	C	F

Table 3. Distribution of other birds/seal at the Bounty Islands, based on 2019 observations

Maximum counts are noted or numbers are summarised as: A = abundant; C = common; O = onshore; F = few.

	Royal albatross	White-capped albatross	Giant petrel	Sooty shearwater	Southern black-backed gull	*Arctic tern	Fur seal
Spider							A
Seal Rock							A
Skua Rock			14				
Proclamation					16	F	A
Depot					1		A
Tunnel					2		A
Ranfurly					2		O

Lion					9		A
Penguin							A
Ruatara					2		C
Funnel					2		A
Prion					4		C
Coronet							
Castle					3		
North Rock					3		1
Molly Cap					1		
Offshore	3	1	F	3	C	F	C

All other islands in the Bounty group, e.g. Con Island, appeared to be wave-washed, so would not have had resident birds.

*This species has not been reported from the Bounty Islands before and the identity of these individuals is still being assessed based on photos.

Southern royal albatross. Three birds were at sea seen just east of Proclamation Island: 2 on 24 Oct and 1 on 28 Oct.

White-capped albatross. One seen at sea seen just east of Proclamation Island on 26 Oct.

Northern giant petrel. This species was regularly seen in small numbers offshore and the species roosted on Skua Rock, with a maximum of 14 birds seen there on 26 Oct. Five were feeding with 15 cape petrels on a dead penguin off Tunnel Island on 29 Oct. Clark et al. (1998) saw this species only at sea but Robertson & van Tets (1982) also noted them roosting on Skua Rock (& also on Lion Rock).

Cape petrel. Birds were flying around and sitting on ledges on five islands but no active nests were seen. Up to 15 birds were seen together at sea off the islands. Robertson & van Tets (1982) suggested that laying began during the second week of November, hence after our visit.

Sooty shearwater. A humerus of this species was found on 28 Oct on Proclamation Island built into a penguin nest. Single live birds were seen at sea 2.5 km NE of the group on 27 Oct and just off Molly Cap and Spider Island on 29 Oct.

Bounty Islands shag. This species was seen ashore on the same islands that it was found nesting on in 1997 and 2004 (with these two previous expeditions reporting breeding also on Penguin and Ruatara Islands - islands which we did not examine in detail). The only nest seen clearly on Proclamation Island was being built and had not been laid in, however around the island group, many other shags were carrying nest material and sitting on nests. The first eggs are estimated to be

laid in mid Oct, with hatching beginning about 19 Nov (Robertson & van Tets 1982). Small numbers were seen offshore but as we arrived at the Bounty Islands on 24 Oct, c.80 birds flew around Ranfurly Island.

Black-backed gull. This species was widespread in small numbers at the Bounty Islands and probably bred on a few islands. The largest number seen at once was 23 circling a drone off Proclamation Island on 29 Oct. See Table 3 for maximum numbers seen ashore at each island. We did not see prions "mobbing" gulls, as reported by Robertson & van Tets (1982).

Antarctic tern. A few adults were seen flying about Proclamation and Tunnel Islands, sometimes carrying fish, but no active nests were seen. Small numbers of terns were seen at sea but on 25 Oct 59 were seen flying in at dusk in small groups from the sea, from the east, to Proclamation Island.

Arctic tern. Most terns seen were in flight and in non-breeding plumage making their identity challenging. Possible Arctic terns were seen ashore on Proclamation Island on 25 Oct and at sea on 25 & 29 Oct.

No skuas or land birds were seen during our 2019.

At-sea pelagic seabird records

Observations of pelagic seabird species between Taiaroa Head and the Bounty Islands by Paul Sagar & me on 22-24 Oct and 29 Oct-1 Nov recorded the following species:

Common: Salvin's albatross, cape petrel, white-chinned petrel, sooty shearwater.

Occasional: southern royal albatross, northern royal albatross, white-capped albatross, northern giant petrel, broad-billed prion, fairy prion, fulmar prion, subantarctic little shearwater, mottled petrel, grey-backed storm petrel, black-bellied storm petrel. Particularly notable were our sightings of 30-40 soft-plumaged petrels, suggesting that this is a key foraging area of this poorly known species in New Zealand waters.

Rare: About 4 Campbell/black-browed albatross, about 4 white-headed petrel, 1 grey-faced petrel, 2 subantarctic skua.

Some of these data have been entered by Paul Sagar and myself into ebird (https://ebird.org/atlasnz/science).

Cetaceans

A small pod of pilot whales was seen by most people while Evohe was motoring off the Bounties on 27 Oct, during a period of winds that were unfavourable for us to land. The pod was seen at 47°43.28'S 179°13.93'E from 1725-1735 hours. Our attention was drawn to them initially because of the unusual concentration of sooty shearwaters seen (c.25). Also present were a couple of white-chinned petrels and (?fulmar) prions. The pod consisted of a dozen or more animals, including at least one very small, browner individual (a new-born calf?). A maximum of c.6 animals were seen on the surface at once.

Additionally two ?dusky dolphins appeared by Evohe briefly on 27 Oct at 47°39.45'S 178°06.18'E.

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