

Ecological Survey Report

East Coast Protection Group

November 2021 to January 2022

Sonya Roxburgh

Surveys carried out:

26 survey days were carried out during this period, plus additional site visits to manage nest cameras. See appendix 1 for list of survey days and survey maps. Due to shorebird nesting being in full swing, birds make up almost the entire focus of surveys for this period. See appendix 2 for tables of shorebird general counts.

1. Sea birds and shore birds

Use of Cape Campbell shoreline area by migratory birds:

As noted in previous reports, northern hemisphere migratory birds make use of the Cape Campbell area during the austral summer, with the main roost being a point at the south end of the Cape Campbell Airstrip. Surveys this summer show that this 3km stretch from the main Cape Campbell reef to the main roost point, is the only area within the 42 km surveyed where these species regularly roost and feed. Throughout this season the number of ruddy turnstone (*Arenaria interpres*) increased to 100, and a group of 5 pacific golden plover (*Puvialis fulva*) were regularly seen here, appearing to stay the entire summer. At low tide, these birds make use of both the main Cape Campbell reef, and the rock reefs for 3 km or more southwards that become exposed. When high tide comes, they retreat to the point at the south end of the airstrip or the sandy beach extending 400m northward of it (depending on wind direction), as this the only site in area that gives them adequate habitat space and shelter to roost. Many native species such as pied shag, little shag and spotted shag also use these sites in the same way.



Pacific Golden Plover south of Cape Campbell.

Banded dotterel (*Charadrius bicinctus*)

Previous data from September/ October showed an estimate of around 160 banded dotterel within the survey area, with at least 70 pairs. Bird count and pair location data shows a steady increase on the overall number of banded dotterel through November and December, indicating over 170 birds, and around 80 pairs, then a sharp and dramatic increase from around 180 to 200 birds through December to over 300 in January. Very little of this increase can be due to nesting success within the survey area, and it is clear that large numbers have been flocking in from elsewhere. Additional birds first became noticeable around the Waima/Ure river mouth, then small flocks and family groups increasing in sporadic places further north, and by early January large flocks were seen congregating from Cape Campbell to the south end of the Cape Campbell airstrip. The number of pairs seen either feeding together, or still nesting or raising chicks, has meanwhile steadily decreased from around 52 pairs in November, to 37 pairs in December and 25 pairs in January. This number for January would be higher if late December nests had been more successful, and chicks still alive.

74 confirmed nests / families with chicks were found, however the actual number of nests laid is likely to be around 130 to 150, based on behavioural activity and location data. A significant number of these would have been pairs making two nesting attempts, and in most areas there appeared to be regular pairs using the same site more than once, with some individuals standing out due to their behavioural traits and almost certainly making two nesting attempts. Many of the confirmed nests only became obvious due to the survival of the chicks. For this reason, the 74 known nests cannot all be directly used to calculate egg and chick survival rates, as it would vastly overestimate survival rates. Approximately 25 to 35 banded dotterel appeared likely to have fledged, although this number also is an estimate, with some chicks' still only 4 to 5 weeks old when last seen. From late December onward, it also became difficult to distinguish local fledglings from those possibly moving in from outside the area, making it difficult to determine nesting success of resident birds.

Counting individual eggs of only those found before hatching, against likely fledging from only those nests, removes some of the "detection by success" loading, and gives a survival rate of 12.2% This, method, however, uses a smaller sample set, so may also have some inaccuracy if used alone. Using estimates of likely total nests and number of likely/possible eggs laid, versus total likely chicks fledged, all calculations range from around 5.5% to 12%. Although this method only uses rough estimates, it still puts the likely fledging success into a relatively narrow range, and a similar figure to the first calculation.

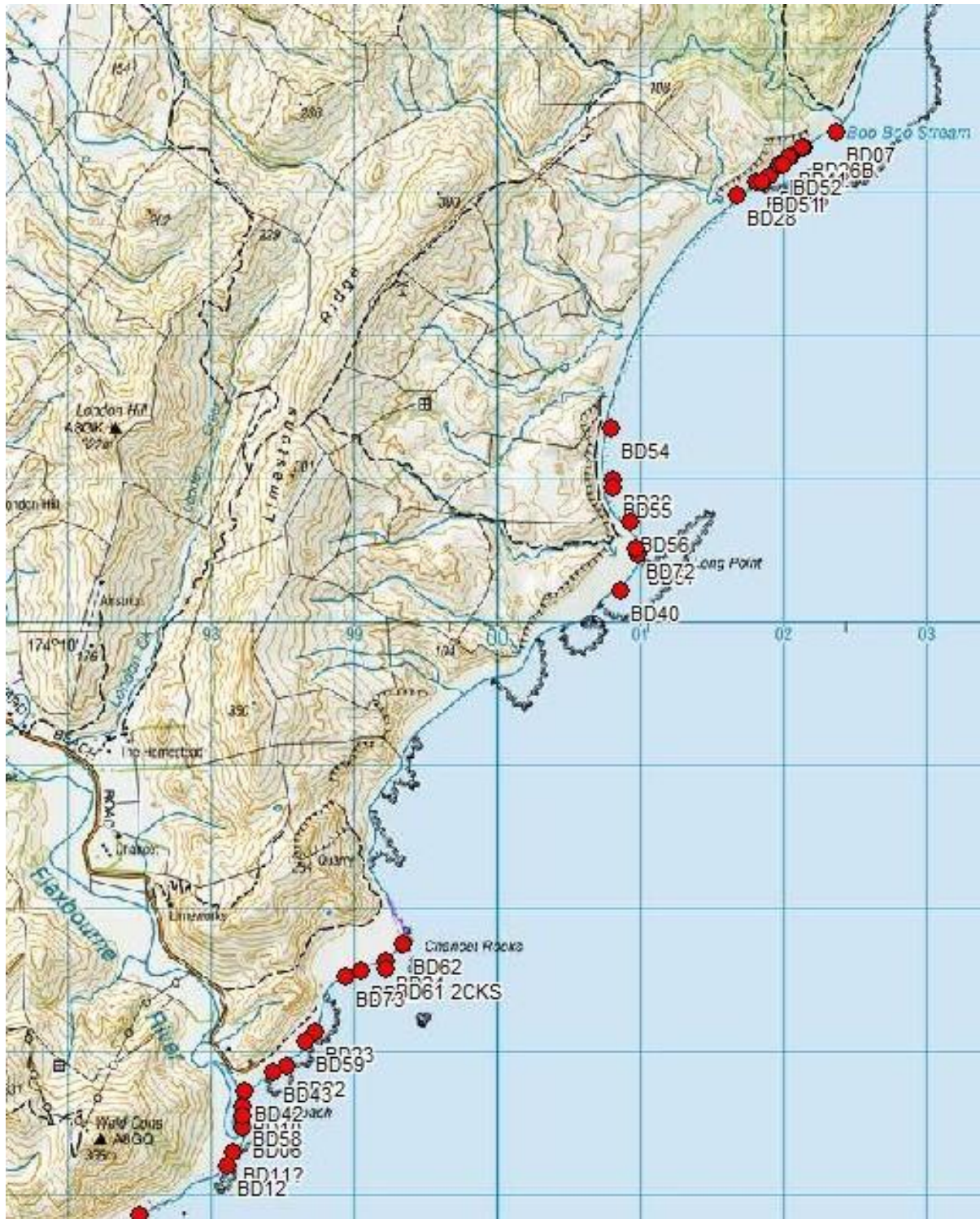
As can be seen in the following maps, a large number of nests are confined to hotspot areas where habitat is suitable; however there are also many large areas of coastline where banded dotterel do not gather or nest, with many areas not often even visited to feed. Some of these areas provide poor or even hostile habitat and wind conditions for nesting, or little beach space above the tide line. Banded dotterel and other species may have also been driven out of some areas due to either predators or humans. There remained a notable absence of banded dotterel from Marfells beach to Cape Campbell this season, despite there being many previous records of nesting in several locations in that area. The highest density nesting sites with favourable substrate, wind conditions and food sources appear to be Booboo stream, Chancet rock to South of Flaxbourne River, Long point, and the beach on the north side of the Needles.

See maps on following pages for locations, and table of all banded dotterel nests found.

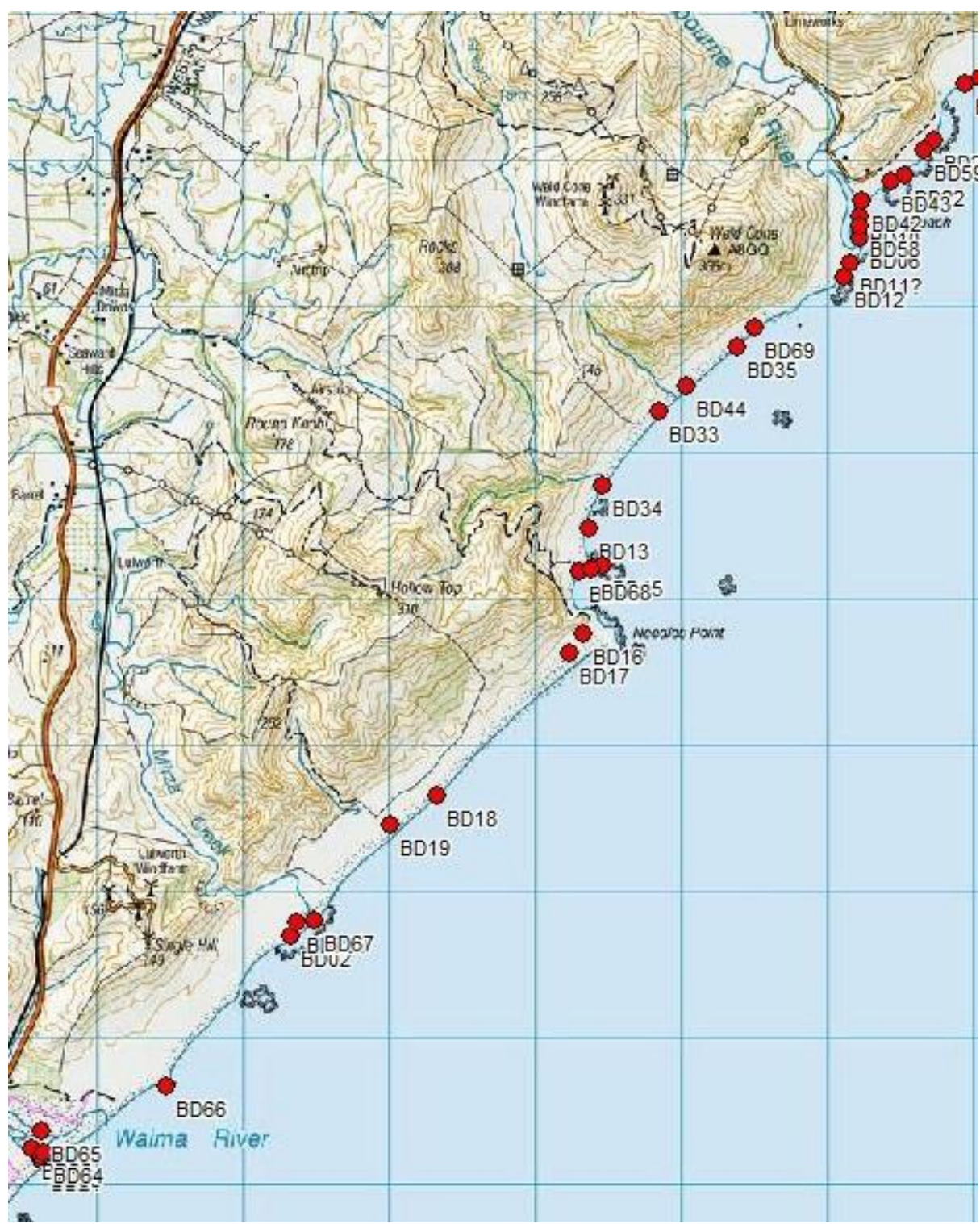
Map 1: Banded Dotterel Nests found, North:



Map 2: Banded Dotterel Nests found, Mid-coast:



Map 3: Banded Dotterel Nests found, South:



List of Banded dotterel nests found up to end of October with known outcomes:

Nest ID#	Location NZ Grid	Area	Nest first seen	# eggs	# known eggs hatched	Chicks likely fledged
BD01	1704273 5376011	Canterbury Gully	05/09/2021	Unknown	0	0
BD02	1694306 5361706	Mirza Creek	09/09/2021	3	Unknown	1
BD03	1705038 5376885	South of CC airstrip	11/09/2021	3	1	0
BD04	1704045 5375953	Canterbury Gully	12/09/2021	3	0	0
BD05	1704002 5375940	Canterbury Gully	12/09/2021	3	0	0
BD06	1698194 5366476	Ward Beach	15/09/2021	Unknown	3	2
BD07	1702348 5373420	Booboo stream on sand	24/09/2021	3	0	0
BD08	1701880 5373125	Booboo stream	24/09/2021	Unknown	3	0
BD09	1701952 5373202	Booboo stream	24/09/2021	2	1	1
BD10	1698196 5366622	Ward Beach	29/09/2021	3	0	0
BD11	1698130 5366312	Ward Beach South of Flaxbourne river	29/09/2021	Unknown	1	0
BD12	1698098 5366214	Ward Beach South of Flaxbourne river	29/09/2021	3	Unknown	0
BD13	1696342 5364490	North of Needles	29/09/2021	Unknown	2	1
BD14	1696376 5364221	North of Needles	29/09/2021	Unknown	2	Unknown
BD15	1696283 5364205	North of Needles	29/09/2021	Unknown	2	2
BD16	1696308 5363773	South side of Needles	29/09/2021	Unknown	0	0
BD17	1696209 5363635	South side of Needles	29/09/2021	Unknown	1	0
BD18	1695302 5362664	Fridge south of Needles	29/09/2021	Unknown	1	Unknown
BD19	1694980 5362472	Fenceline North of Mirza	29/09/2021	3	Unknown	0
BD20	1694347 5361801	Mirza Creek back of beach	29/09/2021	Unknown	Unknown	1
BD21	1692594 5360179	Waima South below terrace	29/09/2021	2	0	0
BD22	1698508 5366909	Ward Beach North	01/10/2021	Unknown	0	0
BD23	1698710 5367151	Ward Beach Boulders	01/10/2021	Unknown	1	1
BD24	1699201 5367641	Chancet	01/10/2021	Unknown	1	1
BD25	1692535 5360255	Waima South side	08/10/2021	3	Unknown	1
BD26a	1702118 5373322	Booboo stream near craypots	10/10/2021	3	0	0
BD26b	1702113 5373318	Booboo stream near craypots	22/10/2021	3	0	0
BD27	1701795 5373083	Booboo stream south	10/10/2021	3	Unknown	1
BD28	1701650 5372988	Stream south of Booboo 1km	10/10/2021	3	2	0
BD29	1705603 5377380	South end of CC airstrip terrace	15/10/2021	3	1	Unknown
BD30	1704299 5376010	Canterbury Gully terrace north	15/10/2021	3	0	0
BD31	1706080 5379245	Cape Campbell Planting area	16/10/2021	3	0	0
BD32	1702028 5373259	Booboo stream Sth900m bl pipe	11/10/2021	3	Unknown	0
BD33	1696824 5365291	Halfway WB to Needles	26/10/2021	3	1	0
BD34	1696442 5364784	Creek North of Needles	26/10/2021	3	3	2
BD35	1697343 5365742	Halfway WB to Needles	26/10/2021	Unknown	1	0



Fledgling banded dotterel near Booboo stream.

List of Banded dotterel nests found November to January with known outcomes:

Nest ID#	Location NZ Grid	Area	Nest first seen	# eggs	# known eggs hatched	Chicks likely fledged
BD36	1703007 5374687	Halfway Booboo to Canterbury gully	09/11/2021	Unknown	1	1
BD37	1703265 5375040	Halfway Booboo to Canterbury gully	09/11/2021	Unknown	1	1
BD38	1706017 5379136	In paddock near road Lighthouse	16/11/2021	3	0	0
BD39	1700791 5371001	North side of LP	24/11/2021	3	3	3
BD40	1700836 5370232	South Side of LP	24/11/2021	3	0	0
BD41	1702017 5373247	Booboo Nth side of pig gully	24/11/2021	3	Unknown	0
BD42	1698218 5366732	Ward Beach picnic table	24/11/2021	3	0	0
BD43	1698418 5366870	Ward Beach Bulldozers	25/11/2021	3	0	0
BD44	1697015 5365460	Midway Needles to WB	29/11/2021	Unknown	1	0
BD45	1696439 5364245	Mermaid pool north of Needles	29/11/2021	Unknown	Unknown	0
BD46	1706021 5379167	Roadside Lighthouse	02/12/2021	3	0	0
BD47	1705538 5377517	CC Airfield	08/12/2021	3	Unknown	Unknown
BD48	1704769 5376512	Near Nicholls gate north of CG	08/12/2021	Unknown	1	1
BD49	1704509 5376172	North of Canturbury gully	08/12/2021	3	3	0
BD50	1703310 5375162	South of Cant gully	10/12/2021	Unknown	Unknown	Unknown
BD51	1701830 5373080	Booboo Sth	10/12/2021	3	0	0
BD52	1701970 5373205	Booboo immediate Sth of Pig gully	10/12/2021	3	Unknown	0
BD53	1698117 5366245	South of Flaxbourne River	29/11/2021	Unknown	Unknown	0
BD54	1700769 5371364	Nth of Ahirako hut	13/12/2021	3	2	Unknown
BD55	1700790 5370950	Ahirako hut	13/12/2021	Unknown	Unknown	1
BD56	1700909 5370711	Nth side of Long point	13/12/2021	Unknown	Unknown	1
BD57	1700954 5370480	Long point	13/12/2021	Unknown	1	Unknown
BD58	1698197 5366563	Ward Beach	19/12/2021	2	2	Unknown
BD59	1698638 5367079	Ward Beach Boulders	19/12/2021	2	Unknown	0
BD60	1699027 5367579	Chancet Mid Bay	19/12/2021	2	1	0
BD61	1699202 5367591	Chancet first rocks	19/12/2021	Unknown	2	0
BD62	1699322 5367757	Chancet Rock far end	19/12/2021	3	Unknown	0
BD63	1692594 5360196	Ure Near track	22/12/2021	Unknown	2	0
BD64	1692616 5360227	Ure Riverbed	22/12/2021	Unknown	2	Unknown
BD65	1692603 5360377	Ure Riverbed	22/12/2021	Unknown	1	1
BD66	1693457 5360675	Nth of Whiterocks point	22/12/2021	Unknown	1	0
BD67	1694470 5361816	Mirza creek Island in creek	22/12/2021	3	Unknown	0
BD68	1696357 5364215	Mermaid pool North of Needles	22/12/2021	3	Unknown	0
BD69	1697477 5365861	South of WB/Nth needles bay terrace	22/12/2021	3	3	Unknown
BD70	1704442 5376032	Canterbury gully outlet lowground	02/01/2022	Unknown	2	2
BD71	1705213 5377208	Beach near Airstrip stockyards	08/12/2021	Unknown	2	2
BD72	1700948 5370516	Long Point highground	11/01/2022	Unknown	1	Unknown
BD73	1698925 5367537	Chancet bay	12/01/2022	2	2	0

Variable Oystercatcher (*Haematopus unicolor*) nesting:

Flocks of variable oystercatcher are regularly seen, particularly in the Cape Campbell area. However, many of these appear to be passing through or roosting while not breeding, and the number of variable oystercatcher nesting within the survey area remains small. Resident pairs are spread somewhat evenly along the coast, with just a slightly higher density around Cape Campbell than other areas. Only around 12 resident adult pairs have been noted, and only nine confirmed nests found, from just 7 or 8 of these pairs. (There are, however, likely to have been other nests that failed before they were able to be recorded.) Out of these, only 1 nest was known to successfully hatch chicks, with only one of those chicks surviving to near fledging. It is highly unlikely that there are other fledglings that have remained undetected. These numbers are concerning, and highlight a need for much greater protection of this species, and a need to monitor the variable oystercatcher population in this area more closely.

During January, the pair named “Nelly and Ned” still on their second nesting attempt for the season near the Needles. Another pair “Wardy and Whitey” and another unnamed pair at Mirza creek nested in areas where they would have almost certainly been frequently disturbed by humans. The only pair that successfully bred appeared to establish their territory in December, in a location where previously none appeared to be resident, south of Mirza creek.

Red-billed gull and white-fronted tern:

Up to around 60 pairs of red billed gull (*Larus novaehollandiae*) and 20 pairs of white-fronted tern (*Sterna striata*) have been observed nesting on an offshore rock at Chancet Rock. Red-billed gulls are also likely to have been nesting in the Lake Grassmere area, however this is not part of the survey area. During much of this survey period, large flocks of red-billed gulls were regularly seen roosting at Marfells beach, and sometimes in the Cape Campbell area. While not listed in the bird counts above, an unofficial count in January recorded a single flock of 400 at Marfells’ beach. Usually these flocks accounted for the majority of this species within the survey area, and on some survey days along other sections of coastline, (particularly south of the Needles) few or even no red billed gulls were seen at all. Smaller flocks of up to 30 were sometimes seen feeding at other locations between Cape Campbell and Chancet Rock, but appeared to return either northward or southward to roost. White fronted tern appear to have regular roost areas at Mussel Point and Cape Campbell, but no definite evidence of nesting was seen in these areas.

Pied stilt:

Three nests were noted within the survey area; One at Ure/Waima river, which successfully fledged three chicks, another in the Flaxbourne river fledged one chick, and a third at the Ward beach boulders appeared to fail.

Little Blue Penguin:

One live little blue penguin (*Eudyptula minor*) was observed coming ashore on a high tide about 1km North of Booboo Stream. It appeared to be healthy and moving without difficulty, and proceeded up a steep section of beach to sleep alone in the marram grass. Close view of the bird was obscured by vegetation, however it appeared to be a juvenile still with some down on it. As a bird this young is unlikely to be far from its parents, this may be an indication that a small number of this species still breed within the survey area. The location was searched a few days later and it appeared to have gone. An adult little blue penguin had been found dead only 250m away around a month earlier, as well as another two around the same time only 2km further south, in the wrack zone following a storm. Another little blue penguin was reported by a member of the public to have come ashore at Marfells' beach in December. It was taken to a rehabilitation centre in Kaikoura, and later died. A number of other little blue penguins were also found dead during surveys. In some cases they appeared to have come ashore alive rather than being washed up dead (found well above high tide marks), which could also indicate they breed nearby. All those found dead appeared to be emaciated.

Other Bird Species Nesting:

Black-backed gull (*Larus dominicanus*) and caspian tern (*Hydroprogne caspia*) both nested in colonies on islands on Lake Grassmere, however no colonies were found within the survey area. Long point appeared to be the main coastal roost of black-backed gull, however they were only seen in small numbers. A small number of pairs appeared they may have been nesting at Long point, or had nests inland nearby.

Through early summer many Pied Shag (*Phalacrocorax varius*) were seen frequently coming and going from an inland colony north of Long point. A number of juvenile pied shag have since been seen along the coast.

2. Other observations:

Pest animals:

An increase in rabbit and hare numbers was noticeable in many areas through spring and early summer, and appeared to have a disturbance impact on some nesting dotterel. Nest camera footage also shows at least two events where nests appear to have been trampled or partly trampled by hares and rabbits. Cat and Hedgehog sign is still also frequent and widespread, with both sign on the beach and nest camera footage showing these are currently be the main predators affecting nesting birds in the survey area. Sign has regularly been seen at Long point, Chancet rock, Booboo stream and the Needles, with potentially the high numbers of nesting birds at these locations drawing the predators onto the shore. While trapping appeared to ease the predation pressure in some areas, it is likely that current trapping cannot yet keep up with the rapid spring breeding rate and constant influx of these pests from further inland. Mice were captured on nest cameras increasingly from December. Magpies have been seen frequently on the beach; they appeared to have been stalking

shorebirds, and were also captured on one nest camera, however no predation event could be confirmed. At least one pig remains in the Booboo stream area, and possibly some other larger ungulates further north.



Feral cat devours a banded dotterel egg on farmland at Cape Campbell.

Stock/fencing issues:

Stock on the beach has still been noted at the Needles, Weld cone, and Long point. A small flock escaped briefly at Chancet rock, before the issue was fixed.

Human Activity:

People, vehicles and dogs on beaches since early December have caused serious disturbance to nesting, and resting birds. As noted earlier, the 3km south of Cape Campbell is an important roosting, feeding and resting location for migratory birds that have travelled up to 12,000km. Vehicles constantly driving though cause them to repeatedly get frightened and fly to a new roost, using additional energy. In recent months this area of beach has been the most used by vehicles within the survey area, with vehicles on every level of beach, and clearly not only for the purposes of reaching a destination to gather seafood. It is impossible to know how many shorebirds nests have been destroyed before being found, however this area of coastline showed a high number of banded dotterel pairs exhibiting breeding behaviour, compared to a very low nest find rate, indicating constant disturbance and high mortality of unfound nests. This is not surprising given that on some survey days from early December, 20 to 30 different vehicles were seen on the beach in this area each day.

Nesting birds, even if not in the direct path of vehicles or people, will leave the nest, attempting to decoy the “predator” away from the nest. Too long spent off the nest will cause eggs to fail. Ward

beach, and southward around 1km, and northward to Chancet rock is also an area where nesting birds are subject to constant disturbance from pedestrians, dogs and vehicles. Due to the habitat, this area is a high density nesting area for banded dotterel, and birds cannot simply find a more remote site, as there are large areas of coastline with habitat unsuitable for nesting.



Favoured shorebird roosting area 3km south of Cape Campbell.



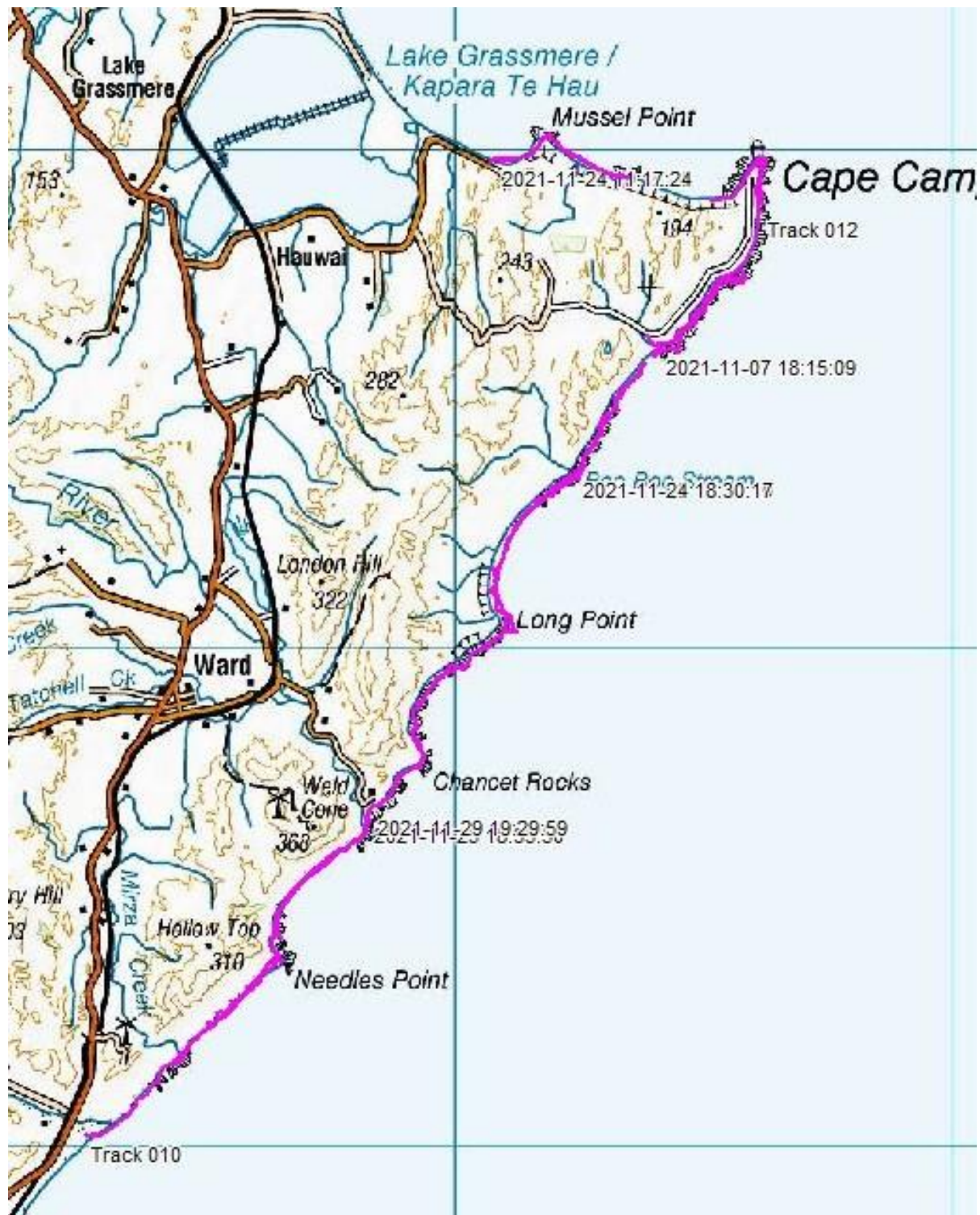
High density banded dotterel nesting zone south of Booboo stream.

Appendix

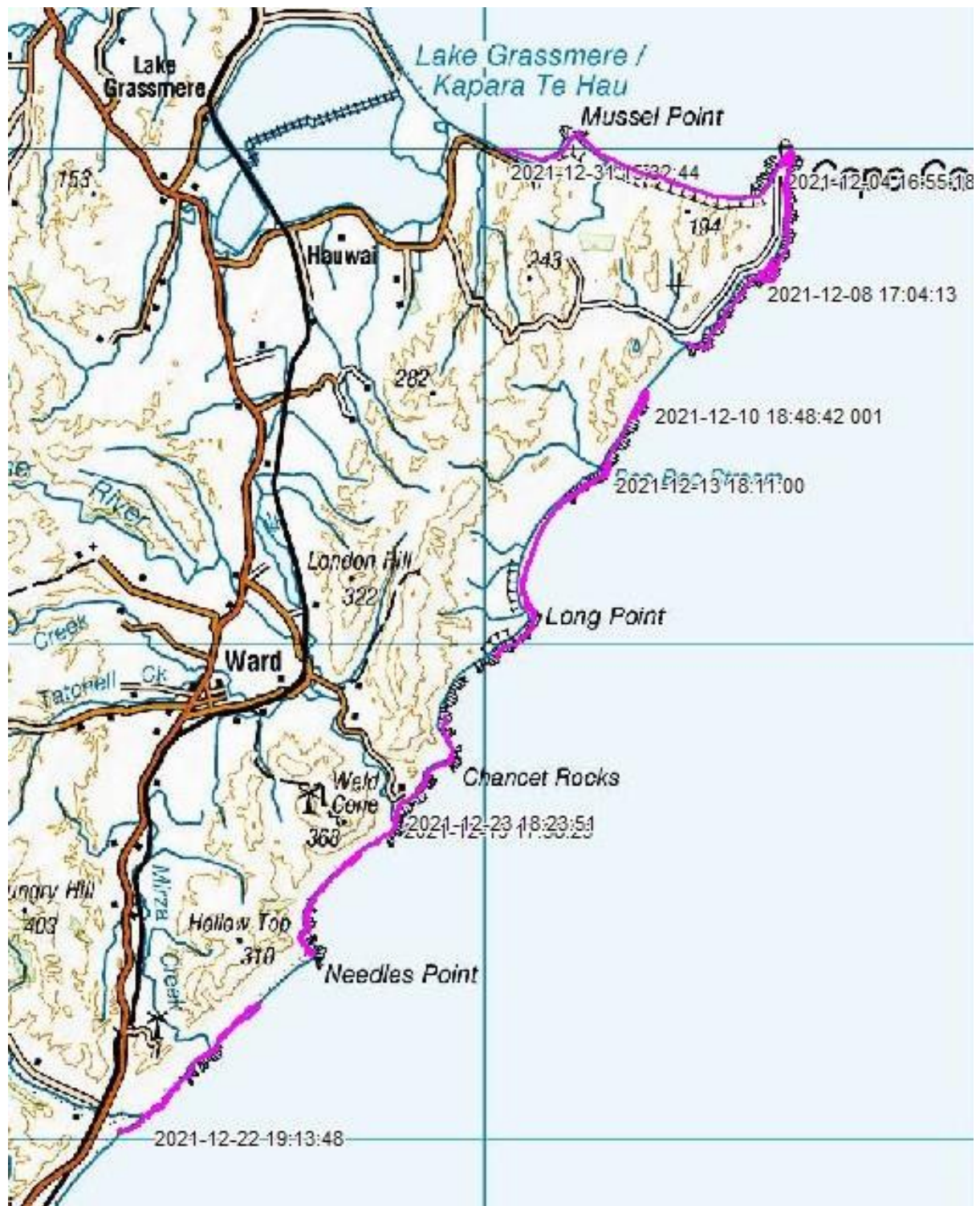
1. Surveys carried out:

Date	Area covered
07/11/2021	Canterbury gully to Cape Campbell Airstrip
08/11/2021	Booboo stream reef and nesting area
09/11/2021	Booboo to Canterbury Gully
18/11/2021	Marfells' beach/ Cape Campbell
20/11/2021	Ure /Waima River to Needles
24/11/2021	Booboo stream Southwards to "mudrock point"
25/11/2021	Ward Beach Northwards to "mudrock point"
29/11/2021	Ward Beach to Needles
04/12/2021	Cape Campbell to Airstrip
08/12/2021	Cape Campbell airstrip to Canterbury Gully
10/12/2021	Booboo stream North and South
13/12/2021	Booboo Stream to South of Long point
19/12/2021	Ward beach to North of Chancet Rock
22/12/2022	Ure /Waima River to Needles
23/12/2022	Ward Beach to Needles
31/12/2022	Marfells' Beach to Cape Campbell planting area
01/01/2022	Booboo stream reef and nesting zone
02/01/2022	Booboo stream Northwards to Canterbury gully / mud platform
08/01/2022	Cape Campbell then airfield to Canterbury gully
11/01/2022	Booboo stream to south of Long point
12/01/2022	Ward beach to north of Chancet Rock
21/01/2022	Ward Beach to Needles
23/01/2022	Ure to Needles and Ward Beach
28/01/2022	Ward Beach/ Chancet Rock
30/01/2022	Canterbury Gully to Cape planting area
31/01/2022	Marfells beach to Cape planting area plus Airstrip point

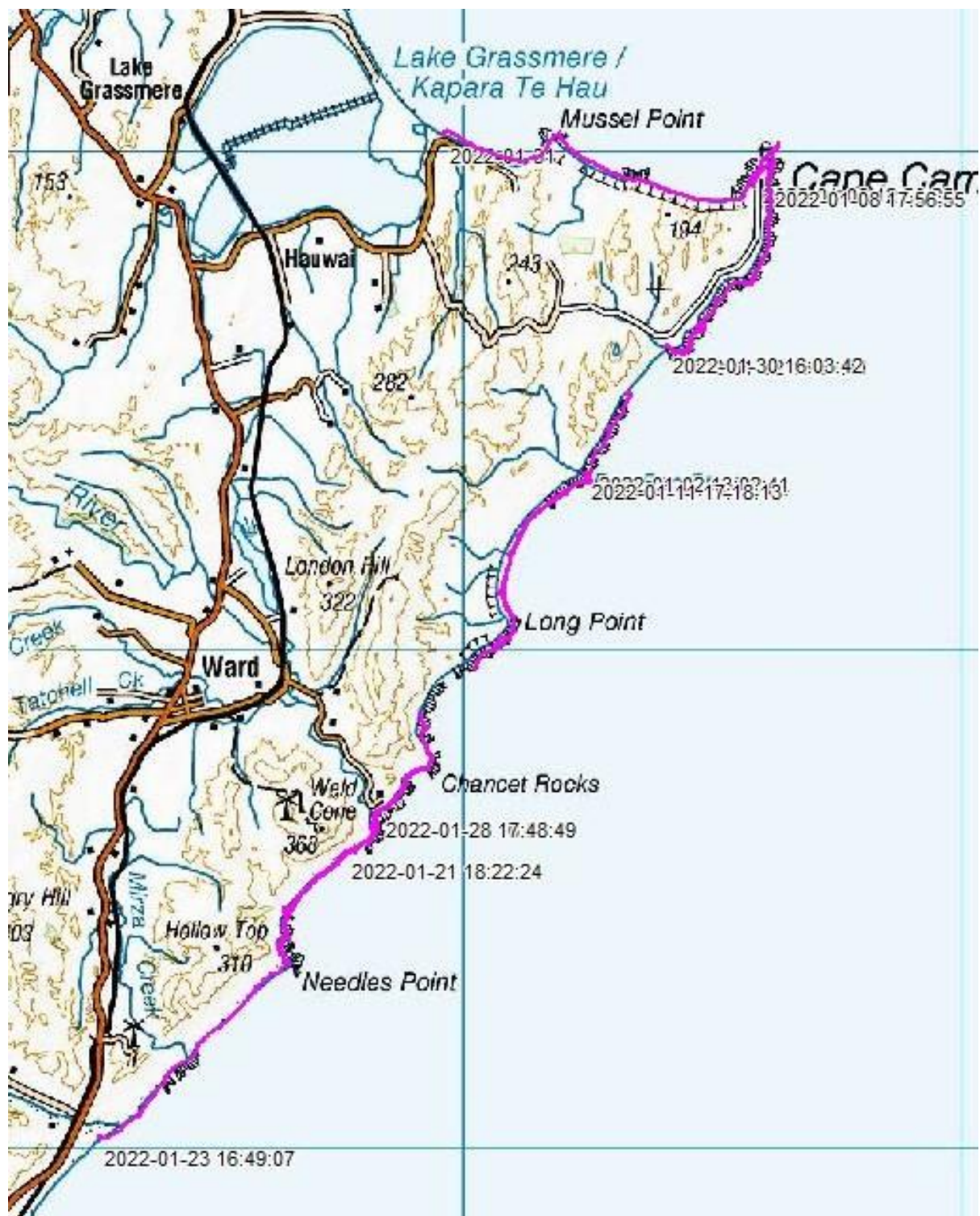
Map of surveys carried out, November:



Map of surveys carried out, December:



Map of surveys carried out, January:



Appendix 2: Shorebird General Counts

General shore and seabird counts November:

	07-Nov	08-Nov	09-Nov	18-Nov	20-Nov	24-Nov	25-Nov	29-Nov
Common name	Canterbury gully to CC Airstrip	Booboo stream	Booboo to Canterbury Gully	Marfells beach/ Cape Campbell	Ure river to Needles	Booboo stream to Mudrock point	Ward Beach to Mudrock point	Ward Beach to Needles
Banded dotterel	34	9	12	0	38	33	16	34
Variable oystercatcher	2	3	3	11	5	6	8	5
S. I. pied oystercatcher	0	2	0	2	4	3	1	0
Black-backed gull	17	15	10	34	13	20	6	9
Black-billed gull	0	0	0	0	22	7	0	0
Red-billed gull	2	6	115	48	6	6	81	27
White-faced heron	1	0	1	5	1	1	3	1
Pied shag	7	7	5	30	9	18	11	5
Spotted shag	0	0	0	0	1	0	0	5
Black shag	1	0	0	2	1	1	1	1
Little shag	1	0	1	5	0	4	0	0
White-fronted tern	0	0	10	25	2	0	2	23
Black-fronted tern	0	0	0	0	0	0	0	0
Caspian tern	2	0	10	8	6	7	5	4
Paradise shelduck	0	0	0	0	7	0	0	0
NZ dotterel	0	0	0	0	0	0	0	0
Pied Stilt	0	0	2	0	3	8	4	2
Little blue penguin	0	0	0	0	0	0	0	0
Ruddy turnstone	0	0	0	0	0	0	0	0
Grey teal	0	0	0	0	0	0	0	0
Pacific golden plover	0	0	0	0	0	0	0	0
Bar-tailed Godwit	0	11	0	0	0	0	0	0
Wrybill	0	0	0	0	0	0	0	0
Black fronted dotterel	0	0	0	0	0	0	0	0
Red Necked Stint	0	0	0	0	0	0	0	0
Black Swan	0	0	0	0	5	0	0	0
Royal Spoonbill								
Sacred Kingfisher	0	0	0	0	0	0	0	0
Australasian Gannet	3	2	0	0	5	0	0	8
White-capped albatross	0	0	0	0	0	0	0	0
Shearwater	0	0	0	400+	50	0	100+	100 appro

General shore and seabird counts December:

	04-Dec	08-Dec	10-Dec	13-Dec	19-Dec	22-Dec	23-Dec	31-Dec
Common name	Cape Campbell to Airstrip	CC airstrip to CG	Booboo stream north and	Booboo to Long point	Ward beach/north of Chancet	Ure to Needles	Ward Beach to Needles	Marfells Beach/Cape Campbell
Banded dotterel	25	33	12	38	21	24	41	5
Variable oystercatcher	6	6	0	4	14	3	2	35
S. I. pied oystercatcher	8	0	1	2	0	3	9	5
Black-backed gull	84	21	18	25	4	92	13	22
Black-billed gull	1	0	0	0	0	14	0	3
Red-billed gull	17	8	27	8	83	128	17	245
White-faced heron	1	1	0	5	1	1	0	10
Pied shag	10	6	17	13	17	15	8	28
Spotted shag	0	0	0	0	1	4	0	1
Black shag	2	1	0	0	1	0	2	1
Little shag	3	0	8	2	0	1	0	3
White-fronted tern	6	5	9	3	25	132	0	75
Black-fronted tern	0	0	0	0	0	0	0	0
Caspian tern	4	5	3	4	3	4	1	25
Paradise shelduck	0	0	0	0	4	0	0	0
NZ dotterel	0	0	0	0	0	0	0	0
Pied Stilt	0	0	0	5	2	6	2	0
Little blue penguin	0	0	1	0	1*	0	1*	1*
Ruddy turnstone	60+	20	0	0	0	0	0	0
Grey teal	0	0	0	0	0	0	0	0
Pacific golden plover	5	5	0	0	0	0	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	0
Wrybill	0	0	0	0	0	0	0	0
Black fronted dotterel	0	0	0	0	0	0	1	0
Red Necked Stint	0	0	0	0	0	0	0	0
Black Swan	0	0	0	0	0	0	0	0
Royal Spoonbill		0	0	0	0	0	0	0
Sacred Kingfisher	0	0	0	0	0	0	0	0
Australasian Gannet	7	1	0	0	0	9	0	7
White-capped albatross	0	0	0	0	0	0	0	0
Shearwater	0	0	0	0	0	250+	0	30+

