



INT 2016/02 IDENTIFICATION OF SEABIRDS CAPTURED IN NEW ZEALAND FISHERIES QUARTERLY REPORT: 1 July 2018 to 31 March 2019.

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Summary:

This report summarises identification work completed on seabirds incidentally caught and returned for necropsy, using photographs of seabird interactions or using interactions listed in the Ministry of Primary Industries Central Observer Database (“COD”) from commercial fishing vessels in New Zealand waters between 1 July 2018 to 31 March 2019.

Necropsy birds are those incidentally caught and killed on commercial fishing vessels in New Zealand waters that are returned by Government observers. Data on age, sex, body condition, moult, breeding status, injuries, stomach and gizzard contents and fat score were collected. In some cases (i.e. specimens damaged by fishing gear, machinery or by sea lice) it was not possible to collect all data; these are reported as ‘unknown’ and appear as such in the relevant tables.

Photographs were provided in electronic format with associated Government observer information (such as vessel name, date of capture, time of capture, etc.) from COD in an Excel spreadsheet. Where possible, the taxon, age, sex and provenance of the seabirds pictured were determined.

Interactions of seabirds with commercial fishing vessels reported by Government observers (where images could not be taken due to crew releasing the bird, the bird disentangling itself before reaching the vessel, or a carcass falling off the line or warp and not being recovered, etc.) also have the associated information (such as vessel name, date of capture, time of capture, possible identification, etc.) provided from COD in an Excel spreadsheet.

Individual seabirds (i.e. necropsy, photo or interaction birds) were allocated a unique necropsy number and all relevant data was entered into an Access database. If multiple photographs are received of an individual bird, the best image is used to match to the corresponding Access database entry, but all images are used to confirm species identification.

Details relating to each specimen are available on request from the Manager, Conservation Services Programme, DOC (email: csp@doc.govt.nz).

Common and scientific names of all species caught, photographed or reported as interactions are provided in Table 1.

There have been 127 seabirds from 21 taxa necropsied from this period (Tables 1 and 2). Five species of seabirds returned to date make up 72.4% of the total captures: Buller’s albatross *Thalassarche bulleri* ($n = 8$, 6.3%), Salvin’s albatross *Thalassarche salvini* ($n = 11$, 8.7%), sooty shearwater *Puffinus griseus* ($n = 18$, 14.2%), New Zealand white-capped albatross *Thalassarche steadi* ($n = 22$, 17.3%) and white-chinned petrel *Procellaria aequinoctialis* ($n = 33$, 26.0%). The remaining 16 taxa had captures ranging in number from one individual to five individuals (Table 2).

One banded white-capped albatross was recorded during this period (banding details are still to be received from the DOC Banding Office). Banded specimens provide valuable longevity, survival and at-sea distribution data. No specimens carried PTT tags.

Table 1 Common and scientific names of seabirds captured and returned or photographed from New Zealand fisheries between 1 July 2018 and 31 March 2019.

Where: ✓ = necropsy specimen with corresponding COD information, P = photo only, Pe = Photo with corresponding information obtained from COD and E = COD interaction information only (no photograph taken by observer)

COMMON NAME	SCIENTIFIC NAME	TOTAL	NECROPSY	PHOTO & EXTRACT (Pe), PHOTO ONLY (P) or COD EXTRACT (E)
Albatross (unidentified)		15		E
Antipodean albatross	<i>Diomedea antipodensis antipodensis</i>	5	✓	
Black petrel	<i>Procellaria parkinsoni</i>	6	✓	Pe & E
Black-backed gull	<i>Larus dominicanus</i>	1		Pe
Black-browed albatross (unidentified)	<i>Thalassarche</i> spp.	1		E
Buller's albatross	<i>Thalassarche bulleri bulleri</i>	9	✓	Pe
Buller's and Pacific albatross	<i>Thalassarche bulleri</i>	1		E
Buller's shearwater	<i>Puffinus bulleri</i>	2		E
Campbell albatross	<i>Thalassarche impavida</i>	1	✓	
Cape petrel (unidentified)	<i>Daption</i> spp.	2		E
Chatham albatross	<i>Thalassarche eremita</i>	7	✓	E
Common diving petrel	<i>Pelecanoides urinatrix</i>	8	✓	E
Fairy prion	<i>Pachyptila turtur</i>	2	✓	Pe
Fiordland crested penguin	<i>Eudyptes pachyrhynchus</i>	1	✓	
Flesh-footed shearwater	<i>Puffinus carneipes</i>	2	✓	
Giant petrel (unidentified)	<i>Macronectes</i> spp.	4		E
Gibson's albatross	<i>Diomedea antipodensis gibsoni</i>	1	✓	
Great albatross (unidentified)	<i>Diomedea</i> spp.	1		E
Great-winged (grey-faced) petrel	<i>Pterodroma macroptera</i>	3		E
Grey petrel	<i>Procellaria cinerea</i>	10	✓	Pe & E
Grey-backed storm petrel	<i>Garrodia nereis</i>	4		Pe & E
Little blue penguin	<i>Eudyptula minor</i>	1		E
New Zealand white-capped albatross	<i>Thalassarche steadi</i>	64	✓	Pe & E
Otago shag		2	✓	
Petrel (unidentified)		10		E
Prion (unidentified)	<i>Pachyptila</i> spp.	2		E
Procellaria petrel (unidentified)	<i>Procellaria</i> spp.	4		E
Salvin's albatross	<i>Thalassarche salvini</i>	28	✓	Pe & E
Seabird (unidentified)		3		E
Shag (unidentified)		1		E
Sooty shearwater	<i>Puffinus griseus</i>	63	✓	Pe & E
Southern royal albatross	<i>Diomedea epomophora</i>	3	✓	E
Spotted shag	<i>Phalacrocorax punctatus</i>	1	✓	
Stewart Island shag	<i>Phalacrocorax chalconotus</i>	2	✓	
Storm petrel (unidentified)		4		E
Wandering albatross (unidentified)	<i>Diomedea exulans</i> spp.	1	✓	
Westland petrel	<i>Procellaria westlandica</i>	9	✓	Pe & E
White-chinned petrel	<i>Procellaria aequinoctialis</i>	118	✓	Pe & E
White-faced storm petrel	<i>Pelagodroma marina</i>	2		E
Total		404	127	277

Nearly three-quarters of all birds returned were males ($n = 95$, 74.8%). However, Antipodean albatross, Fiordland crested penguin and spotted shag were either all or dominated by females (Table 2).

The majority of all birds returned were adults ($n = 117$, 92.1%) and 50.4% of all the adult birds were in breeding condition (Table 2).

Over three-quarters ($n = 101$, 79.5%) of the returned seabirds between 1 July 2018 and 31 March 2019 were identified correctly by the Government observers. There were 14 (11%) identified to the correct group, one identified as a large seabird (0.8%) and eight (Buller's albatross, common diving petrel, grey petrel, NZ white-capped albatross, Otago shag, Salvin's albatross and two white-chinned petrels, 6.3%) that was identified incorrectly.

Forty-five trawl, longline and setnet vessels have returned birds to date and preliminary data are shown in Table 3. Due to the length of some fishing trips and subsequent transport it is possible some birds captured during this reporting period may not have been received at the time of writing. Any further specimens received will be reported at a later date. There were 100 birds returned from trawl vessels (78.7%; with 50 caught in the net, five in the cod-end, 23 in other areas, 20 on the warp and one recorded as a vessel impact), six from setnet vessels (4.7%) and 21 from longline vessels (16.5%; with 12 hooked in the bill or swallowed the hook, two hooked in the wing and seven with unknown hook position (likely to be in the bill)) (Tables 3 and 4). Detailed analysis of captures per vessel type and target fisheries will be undertaken at the end of the reporting year when this information has been collated from DOC CSP and MPI.

Most of the returned birds to date had a range of injuries from 'no obvious injury' to 'lacerated' (Table 4). Thirty-four birds (36.8%) showed injuries suggesting entanglement and crush injuries from the trawl warp and blocks. Seven birds (5.5%) had grease covering part or all of the body. Fifty-four birds (42.5%) had no obvious injuries. Nearly quarter of the birds (24.4%) were waterlogged and had drowned in the trawl nets or when attached to hooks. Fourteen birds still had hooks present (two in the wing, nine in the bill and three in the throat). More detailed reporting of injuries and cause of death will be reported in the end of year report.

Stomach contents have been identified into main groups and are shown in Table 5. Over half of the returned birds had bait, offal or discards in their stomachs ($n = 72$, 56.71%). Another 37 (29.1%) had empty stomachs (Table 5). One Buller's albatross, one fairy prion, three grey petrels, two Westland petrels and two white-chinned petrels had proventricular oil in the stomach which is evidence of feeding a chick (Table 5). Nearly one-fifth of the birds ($n = 25$, 19.7%) had natural food items in their stomachs. Barnacles and/or seaweed was recorded in three birds (two Salvin's albatross and one Otago shag; 2.4%). One New Zealand white-capped albatross had plastic in its stomach.

Most gizzard contents were natural food items (i.e. squid beaks, bones, eyeballs and otoliths), but 17.3% of returned birds ($n = 22$) had empty gizzards (Table 6). Twelve birds (one Chatham albatross, four grey petrels, one Stewart Island shag, one Westland petrel and five white-chinned petrel) had worms in their gizzards (Table 6). Fourteen birds (two flesh-footed shearwater, one New Zealand white-capped albatross, eight sooty shearwaters and three white-chinned petrels; 11%) had plastic in their gizzards (Table 6). Nine birds (two Buller's albatross, two Chatham albatross, a flesh-footed shearwater, a grey petrel, a sooty shearwater, a Stewart island shag and a white-chinned petrel) also had stones, barnacles, feathers and/or seaweed in their gizzards (Table 6).

The mean fat score was 2.3 ± 0.1 (Table 7). Fat scores of 1 and 2 were most often recorded in the birds returned between 1 July 2018 and 31 March 2019 ($n = 75$, 59%), with 79.5% of birds having fat scores of 3 or less (Table 7). Only 20 birds (a black petrel, a Chatham albatross, eight NZ white-capped albatross, four Salvin's albatross, a sooty shearwater and three white-chinned petrels; 15.7%) had a fat score higher than 3 (Table 7). There were three birds (a Salvin's albatross, an unidentified wandering albatross and a white-chinned petrel), that could not have their fat scores determined due to damage (Table 7).

Table 2 Species and numbers of seabirds killed and returned from observed fishing vessels between 1 July 2018 and 31 March 2019, by sex (M = male, F = female, U = unknown) and age (A = adult, BA = breeding adult, N = non-breeding adult, SA = sub-adult, I = immature and J = juvenile, U = unknown).

SPECIES	SEX			AGE							Total	% TOTAL
	M	F	U	A	BA	N	SA	I	J	U		
Antipodean albatross	1	4		3				2			5	3.9%
Black (Parkinson's) petrel	3	1		4	3						4	0.8%
Buller's albatross	6	2		8	2						8	6.3%
Campbell albatross	1			1							1	3.1%
Chatham Island albatross	4			4	4						4	3.1%
Common diving petrel	1			1							1	0.8%
Fairy prion	1			1	1						1	0.8%
Fiordland crested penguin		1		1	1						1	0.8%
Flesh-footed shearwater	2			2	1						2	0.8%
Gibson's albatross	1			1							1	1.6%
Grey petrel	5			5	3	1					5	3.9%
NZ white-capped albatross	14	5	3	20	7		1			1	22	1.6%
Otago shag	2							2			2	0.8%
Salvin's albatross	6	5		10	9		1				11	0.8%
Sooty shearwater	15	3		17	8		1				18	8.7%
Southern royal albatross	1			1							1	14.2%
Spotted shag		1		1							1	1.6%
Stewart Island shag	2			2							2	0.8%
Wandering albatross (unidentified)			1							1	1	26.0%
Westland petrel	3			3	2						3	17.3%
White-chinned petrel	27	4	2	32	18					1	33	2.4%
TOTAL	95	26	6	117	59	1	3	4	0	3	127	
% TOTAL	74.8	20.5	4.7	92.1	46.5	0.8	2.4	3.1		2.4		

Table 3 Number of seabirds of each species killed and returned from observed fishing vessels between 1 July 2018 and 31 March 2019, by fisheries type and location of capture.

Species	Bottom/Midwater Trawl						Setnet	Longline		Total
	Net	Cod-end	Lengthener	Other	Warp	Deck strike		Hook	Deck strike	
Antipodean albatross								5		5
Black (Parkinson's) petrel	1							3		4
Buller's albatross	2			1	3			2		8
Campbell albatross						1				1
Chatham Island albatross					2			2		4
Common diving petrel		1								1
Fairy prion	1						1			1
Fiordland crested penguin								1		1
Flesh-footed shearwater								2		2
Gibson's albatross								1		1
Grey petrel	4							1		5
NZ white-capped albatross	7	2	2	2	9					22
Otago shag							2			2
Salvin's albatross	5			1	4			1		11
Sooty shearwater	13			1	4					18
Southern royal albatross				1						1
Spotted shag							1			1
Stewart Island shag							2			2
Wandering albatross (unidentified)				1						1
Westland petrel	1							2		3
White-chinned petrel	16	2	5	7	1			2		33
Total	52	5	9	14	20	1	6	21	0	127
% Total (fishing type)	52	5	9	14	20	1				
TOTAL	100						6	21		
% TOTAL	78.7						4.7	16.5		

Table 4 Number of seabirds killed and returned from observed fishing vessels between 1 July 2017 and 31 March 2019, by injury.Note: Birds can have multiple injuries resulting in higher figures than the total number of seabirds killed and returned ($n = 127$).

Species	No injuries	Hook						Broken bones, etc.	Lacerations and/or severed body parts	Crushed	Greased	Liced	Water-logged
		Body	Wing	Bill	Throat or Swallowed	Foot	Unknown ¹						
Antipodean albatross	2			4			1					1	
Black (Parkinson's) petrel	3			1			2		1			1	
Buller's albatross	3				1		1	2	2	3	1	2	
Campbell albatross	1												
Chatham Island albatross				2				1	3	2	1	1	
Common diving petrel									1				
Fairy prion	1											1	
Fiordland crested penguin	1											1	
Flesh-footed shearwater	2						2					1	
Gibson's albatross					1								
Grey petrel							1	5	1			1	
NZ white-capped albatross	5							8	6	5	3	1	2
Otago shag	1							1					
Salvin's albatross	3			1				3	4	2		5	
Sooty shearwater	11							7	1			3	
Southern royal albatross	1												
Spotted shag											1	1	
Stewart Island shag	2											1	
Wandering albatross (unidentified)									1				
Westland petrel	2		1	1				1				2	
White-chinned petrel	16		1		1			7		2	1	1	8
Total	54	0	2	9	3	0	7	35	20	14	7	2	31
% Total	42.5		1.6	7.1	2.4		5.5	27.6	15.7	11.0	5.5	1.6	24.4

¹ An unknown hook location relates to a seabird caught and killed on a longline vessel but with no apparent hook injury anywhere on the body. No additional capture information was provided by the observer. These seabirds may have been tangled in the line rather than hooked.

Table 5 Stomach contents of seabirds killed and returned on fishing vessels between 1 July 2018 and 31 March 2019.Note: Birds can have multiple items in the stomachs resulting in higher content figures than the total number of seabirds killed and returned ($n = 127$).

SPECIES	EMPTY	MISSING	BAIT	OFFAL (OR DISCARDS)	NATURAL	BARNACLES OR SEAWEED	PLASTIC	PROVENTRICULAR OIL	WORMS
Antipodean albatross	4			1	1				
Black (Parkinson's) petrel	1			2	1				
Buller's albatross			3	8	2			1	1
Campbell albatross				1					
Chatham Island albatross				2	3				
Common diving petrel	1								
Fairy prion								1	
Fiordland crested penguin	1								
Flesh-footed shearwater	2								
Gibson's albatross	1								
Grey petrel	1			3	1			3	
NZ white-capped albatross	5	3	1	11	8		1		
Otago shag				2	1	1			
Salvin's albatross	5		1	4	1	2			
Sooty shearwater	7		1	8	2				
Southern royal albatross	1								
Spotted shag	1								
Stewart Island shag					1				1
Wandering albatross (unidentified)		1							
Westland petrel			1	1				2	
White-chinned petrel	8	1	5	14	6			2	
TOTAL	37	5	14	58	25	3	1	9	2
% TOTAL	29.1	3.9	11.0	45.7	19.7	2.4	0.8	7.1	1.6

Table 6 Gizzard contents of seabirds killed and returned on fishing vessels between 1 July 2018 and 31 March 2019.Note: Birds can have multiple items in the gizzard resulting in higher content figures than the total number of seabirds killed and returned ($n = 127$).

SPECIES	EMPTY	MISSING	SQUID BEAKS	OTOLITHS	EYEBALLS	BONES OR SKIN	PLASTIC	WORMS	STONES, BARNACLES, FEATHERS, SEAWEED
Antipodean albatross	1		4		1	3			
Black (Parkinson's) petrel	1		3		1	1			
Buller's albatross	2		3	1	2	4			2
Campbell albatross	1								
Chatham Island albatross			2	1		4		1	2
Common diving petrel	1								
Fairy prion			1						
Fiordland crested penguin	1								
Flesh-footed shearwater			1				2		1
Gibson's albatross					1				
Grey petrel			5	2		4		4	1
NZ white-capped albatross	6	3	3	6	5	8	1		
Otago shag	1								
Salvin's albatross	4		4	5	4	4			
Sooty shearwater	4		8	1	1	2	8		1
Southern royal albatross			1		1				
Spotted shag	1								
Stewart Island shag						2		1	1
Wandering albatross (unidentified)		1							
Westland petrel			3	1	1			1	
White-chinned petrel			28	6	5	12	3	5	1
TOTAL	22	4	66	23	22	44	14	12	9
% TOTAL	17.3	3.1	52.0	18.1	17.3	34.6	11.0	9.4	7.1

Table 7 Comparison of fat scores in the returned birds between 1 July 2018 and 31 March 2019 (1= no fat to 5 = extremely fat, U = unknown).

SPECIES	FAT SCORE						MEAN (±SE)
	1	2	3	4	5	U	
Antipodean albatross	2	2	1				1.8 ± 0.4
Black (Parkinson's) petrel	1	2		1			2.3 ± 0.6
Buller's albatross	3	4	1				1.8 ± 0.3
Campbell albatross	1						1.0 ± 0.0
Chatham Island albatross	1	2			1		1.7 ± 0.3
Common diving petrel					1		5.0 ± 0.0
Fairy prion			1				3.0 ± 0.0
Fiordland crested penguin			1				3.0 ± 0.0
Flesh-footed shearwater			2				3.0 ± 0.0
Gibson's albatross	1						1.0 ± 0.0
Grey petrel	1	3		1			2.2 ± 0.5
NZ white-capped albatross	5	2	4	5	3		2.9 ± 0.3
Otago shag	2						1.0 ± 0.0
Salvin's albatross		2	4	3	1	1	3.3 ± 0.3
Sooty shearwater	6	6	5		1		2.1 ± 0.3
Southern royal albatross	1						1.0 ± 0.0
Spotted shag	1						1.0 ± 0.0
Stewart Island shag	2						1.0 ± 0.0
Wandering albatross (unidentified)						1	
Westland petrel	1	1	1				2.0 ± 0.6
White-chinned petrel	8	15	6	3		1	2.1 ± 0.2
TOTAL	36	39	26	13	7	3	2.3 ± 0.1
% TOTAL	28.3	30.7	20.5	10.2	5.5	2.4	

Examination of photographs and COD gave a total of 277 birds that were reported captured (i.e. *Interaction*; $n = 150$) or photographed (i.e. *Photo*; $n = 127$) as seabird interactions from this period with 28 fishing vessels (257 seabirds on trawl, 18 on longline and two on set net vessels) and may include some non-capture interactions such as vessel impacts (Table 8).

Table 8 Number of seabird interactions photographed or recorded on fishing vessels between 1 July 2018 and 31 March 2019.

	Dead	Alive	Total
Photographed and listed in MPI COD extract	88	18	106
Photographed but not listed in MPI COD extract to date	0	0	0
Photographed and listed in MPI COD extract, but image not received to date	21	1	22
Listed as an interaction only in MPI COD extract, but not photographed	22	127	149
Total	131	146	277
% Total	47.3%	52.7%	

Of the 106 birds that are listed in the COD extract and with photographs, 95 (89.6%) were identified correctly by the observers, six (5.7%) were identified to the correct group and five (4.7%) were identified incorrectly (a fairy prion, two grey petrels, a sooty shearwater and a Westland petrel).

The seabirds caught, killed and returned, photographed or recorded as an interaction to date were caught in a range of Fishing Management Areas (FMA 1, 2, 3, 4, 5, 6, 7 and 8) and general positions are show in Figures 1 and 2.

Figure 1 Catch locations of all seabirds killed and returned for necropsy, photographed and/or reported as interactions in New Zealand fisheries between 1 July 2018 and 31 March 2019.

Note: some catch location symbols may be obscured by overlying symbols (e.g. where several individuals were captured from the same tow or set, each bird will have the same catch location and appear on the maps as a single symbol).

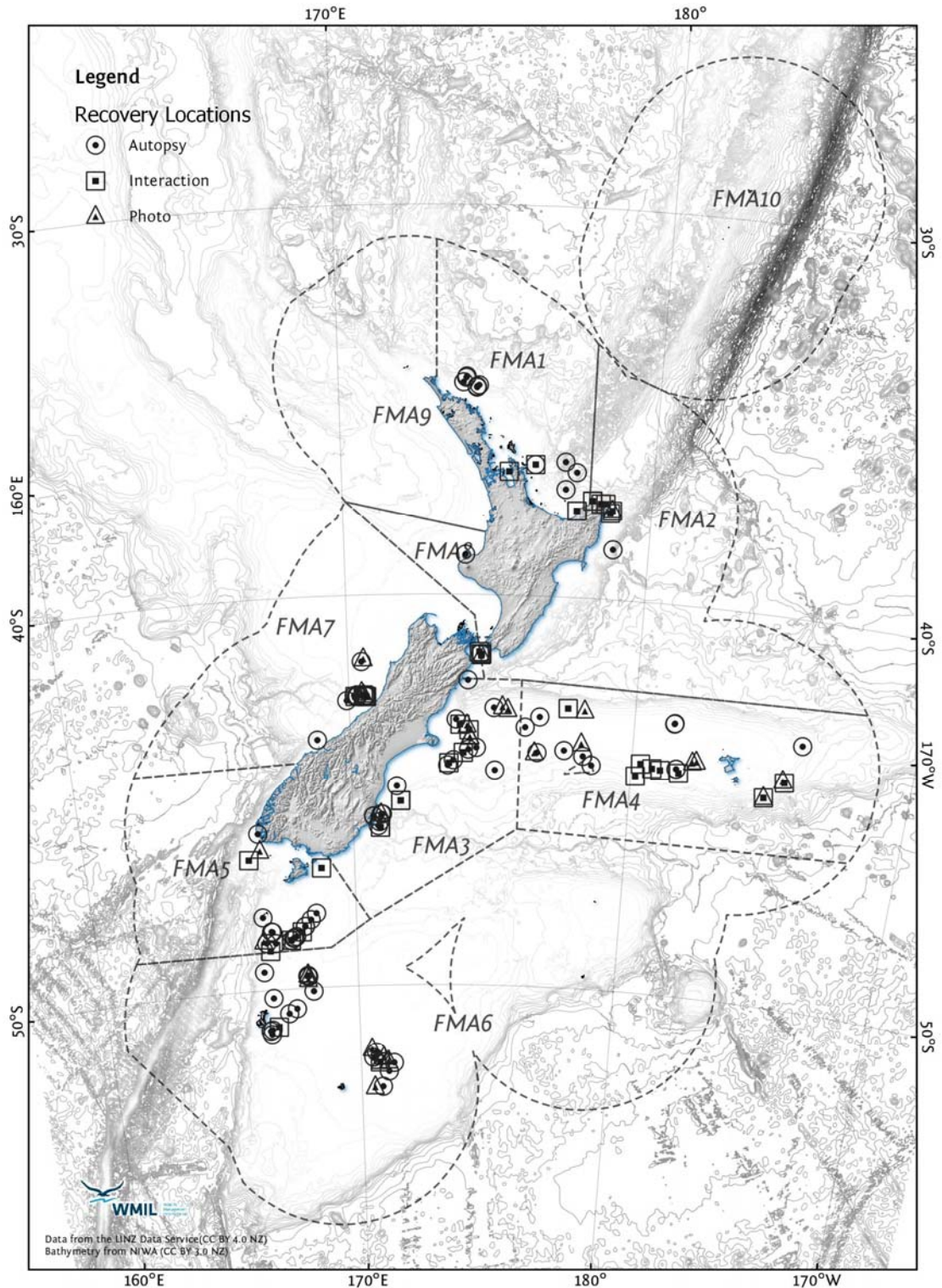


Figure 2 Grouped catch locations of all seabirds killed and returned for necropsy, photographed and/or reported as interactions in New Zealand fisheries between 1 July 2018 and 31 March 2019.

