

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

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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 December 2018.

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 57 seabirds from 18 taxa necropsied from this period (Tables 1 and 2). Six species of seabirds returned to date make up 64.9% of the total captures: Salvin’s albatross *Thalassarche salvini* ($n = 10$, 17.5%), white-chinned petrel *Procellaria aequinoctialis* ($n = 7$, 12.3%), Buller’s albatross *Thalassarche bulleri bulleri* ($n = 6$, 10.5%), grey petrel *Procellaria cinerea* ($n = 5$, 8.8%),

Antipodes albatross *Diomedea antipodensis antipodensis* ($n = 5$, 8.8%) and Chatham albatross *Thalassarche eremita* ($n = 4$, 7.0%). The remaining 13 taxa had captures ranging in number from one individual to three individuals (Table 2).

No banded birds were recorded during this period. 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 December 2018.

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)		6		E
Antipodean albatross	<i>Diomedea antipodensis antipodensis</i>	5	✓	
Black petrel	<i>Procellaria parkinsoni</i>	2	✓	
Black-backed gull	<i>Larus dominicanus</i>	1		P
Buller's albatross	<i>Thalassarche bulleri bulleri</i>	7	✓	Pe
Buller's and Pacific albatross	<i>Thalassarche bulleri</i>	1		E
Buller's shearwater	<i>Puffinus bulleri</i>	1		E
Campbell albatross	<i>Thalassarche impavida</i>	1	✓	
Cape petrel (unidentified)	<i>Daption spp.</i>	1		E
Chatham albatross	<i>Thalassarche eremita</i>	7	✓	E
Common diving petrel	<i>Pelecanoides urinatrix</i>	7		E
Fairy prion	<i>Pachyptila turtur</i>	2	✓	Pe
Fiordland crested penguin	<i>Eudyptes pachyrhynchus</i>	1	✓	
Flesh-footed shearwater	<i>Puffinus carneipes</i>	1	✓	
Gibson's albatross	<i>Diomedea antipodensis gibsoni</i>	1	✓	
Great albatross (unidentified)	<i>Diomedea spp.</i>	2		Pe & E
Great-winged (grey-faced) petrel	<i>Pterodroma macroptera</i>	2		E
Grey petrel	<i>Procellaria cinerea</i>	9	✓	Pe
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>	6	✓	Pe & E
Petrel (unidentified)	<i>Procellaria spp.</i>	1		E
Prion (unidentified)	<i>Pachyptila spp.</i>	1		E
Salvin's albatross	<i>Thalassarche salvini</i>	22	✓	Pe & E
Seabird (unidentified)		2		E
Sooty shearwater	<i>Puffinus griseus</i>	4	✓	E
Southern royal albatross	<i>Diomedea epomophora</i>	2	✓	E
Spotted shag	<i>Phalacrocorax punctatus</i>	1	✓	
Stewart Island shag	<i>Phalacrocorax chalconotus</i>	1	✓	
Storm petrel (unidentified)		1		E
Wandering albatross (unidentified)	<i>Diomedea exulans spp.</i>	1	✓	
Westland petrel	<i>Procellaria westlandica</i>	6	✓	Pe
White-chinned petrel	<i>Procellaria aequinoctialis</i>	16	✓	E
White-faced storm petrel	<i>Pelagodroma marina</i>	2		E
Total		128	57	73

Over two-thirds of all birds returned were males ($n = 39$, 68.4%). 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 ($n = 51$, 89.5%) and 62.7% of all the adult birds were in breeding condition (Table 2).

Nearly three-quarters ($n = 42$, 73.7%) of the returned seabirds between 1 July 2018 and 31 December 2018 were identified correctly by the Government observers. There were nine (15.8%) identified to the correct group, one identified as a large seabird (1.8%) and five (Buller's albatross, grey petrel, NZ white-capped albatross, Salvin's albatross and white-chinned petrel, 8.8%) that was identified incorrectly.

Forty-nine 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 35 birds returned from trawl vessels (61.4%; with 23 caught in the net, one in the cod-end, four in other areas, nine on the warp and one recorded as a vessel impact), three from setnet vessels (5.3%) and 19 from longline vessels (33.3%; with nine hooked in the bill or swallowed the hook, two hooked in the wing and eight 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). Twenty-two birds (38.6%) showed injuries suggesting entanglement and crush injuries from the trawl warp and blocks. Five birds (8.8%) had grease covering part or all of the body. Seventeen birds (29.8%) had no obvious injuries. Nearly half of the birds (45.6%) were waterlogged and had drowned in the trawl nets or when attached to hooks. Eleven birds still had hooks present (two in the wing, five in the bill and four 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. Nearly half of the returned birds had bait, offal or discards in their stomachs ($n = 24$, 42.1%). Another 21 (36.8%) had empty stomachs (Table 5). One Buller's albatross, one fairy prion, three grey petrels and two Westland petrels had proventricular oil in the stomach which is evidence of feeding a chick (Table 5). Nearly one-quarter of the birds ($n = 13$, 22.8%) had natural food items in their stomachs. Barnacles and/or seaweed was recorded in two birds (both Salvin's albatross, 3.6%). No birds had plastic in their stomachs.

Most gizzard contents were natural food items (i.e. squid beaks, bones, eyeballs and otoliths), but 19.3% of returned birds ($n = 11$) had empty gizzards (Table 6). Six birds (one Chatham albatross, four grey petrels and one Westland petrel) had worms in their gizzards (Table 6). Three birds (one flesh-footed shearwater and two sooty shearwaters, 5.5%) had plastic in their gizzards (Table 6). Six birds (two Buller's albatross, two Chatham albatross, a flesh-footed shearwater and a grey petrel) also had stones, barnacles, feathers and/or seaweed in their gizzards (Table 6).

The mean fat score was 2.4 ± 0.2 (Table 7). Fat scores of 1 and 2 were most often recorded in the birds returned between 1 July 2018 and 31 December 2018 ($n = 31$, 54.4%), with 77.2% of birds having fat scores of 3 or less (Table 7). Only ten birds (black petrel, Chatham albatross, NZ white-capped albatross, four Salvin's albatross and two white-chinned petrels; 17.6%) 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 December 2018, 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	8.8
Black (Parkinson's) petrel	2			2	2						2	3.5
Buller's albatross	4	2		6	1						6	10.5
Campbell albatross	1			1							1	1.8
Chatham Island albatross	4			4	4						4	7.0
Fairy prion	1			1	1						1	1.8
Fiordland crested penguin		1		1	1						1	1.8
Flesh-footed shearwater	1			1	1						1	1.8
Gibson's albatross	1			1							1	1.8
Grey petrel	5			5	3	1					5	8.8
NZ white-capped albatross	2	1		2			1				3	5.3
Salvin's albatross	5	5		9	8		1				10	17.5
Sooty shearwater	2	1		3	3						3	5.3
Southern royal albatross	1			1							1	1.8
Spotted shag		1		1							1	1.8
Stewart Island shag	1			1							1	1.8
Wandering albatross (unidentified)			1							1	1	1.8
Westland petrel	3			3	2						3	5.3
White-chinned petrel	5	1	1	6	6					1	7	12.3
TOTAL	39	16	2	51	32	1	2	2		2	57	
% TOTAL	68.4	28.1	3.5	89.5	62.7	1.8	3.5	3.5		3.5		

Table 3 Number of seabirds of each species killed and returned from observed fishing vessels between 1 July 2018 and 31 December 2018, 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								2		2
Buller's albatross	2				2			2		6
Campbell albatross						1				1
Chatham Island albatross					2			2		4
Fairy prion		1								1
Fiordland crested penguin	1						1			1
Flesh-footed shearwater								1		1
Gibson's albatross								1		1
Grey petrel	4							1		5
NZ white-capped albatross	1				2					3
Salvin's albatross	5			1	3			1		10
Sooty shearwater	3									3
Southern royal albatross				1						1
Spotted shag	1						1			1
Stewart Island shag	1						1			1
Wandering albatross (unidentified)				1						1
Westland petrel	1							2		3
White-chinned petrel	4			1				2		7
Total	23	1	0	4	9	1	3	19	0	57
% Total (fishing type)	65.7	2.9	0	11.4	25.7	2.9				
TOTAL	35						3	19		
% TOTAL	61.4						5.3	33.3		

Table 4 Number of seabirds killed and returned from observed fishing vessels between 1 July 2017 and 31 December 2018, by injury.

Note: Birds can have multiple injuries resulting in higher figures than the total number of seabirds killed and returned ($n = 57$).

Species	No injuries	Hook						Broken bones, etc.	Lacerations and/or severed body parts	Crushed	Greased	Liced	Waterlogged
		Body	Wing	Bill	Throat or Swallowed	Foot	Unknown ¹						
Antipodean albatross	2			2	2		1					1	
Black (Parkinson's) petrel	1						2		1			1	
Buller's albatross	1				1		1	3	4	1	1	2	
Campbell albatross	1												
Chatham Island albatross				2				2	4	1	1	1	
Fairy prion	1											1	
Fiordland crested penguin	1											1	
Flesh-footed shearwater	1						1					1	
Gibson's albatross					1								
Grey petrel							1	5	1			1	
NZ white-capped albatross									4	1	1	2	
Salvin's albatross	2			1				5	5	1		5	
Sooty shearwater	2							1				3	
Southern royal albatross	1												
Spotted shag											1	1	
Stewart Island shag	1											1	
Wandering albatross (unidentified)									1				
Westland petrel	2		1				1	1				2	
White-chinned petrel	1		1				1	1	2		1	3	
Total	17	0	2	5	4	0	8	18	22	4	5	0	26
% Total	29.8		3.5	8.8	7.0		14.0	31.6	38.6	7.0	8.8		45.6

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 December 2018.Note: Birds can have multiple items in the stomachs resulting in higher content figures than the total number of seabirds killed and returned ($n = 57$).

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				1				
Buller's albatross			1	7	1			1	1
Campbell albatross				1					
Chatham Island albatross				2	3				
Fairy prion								1	
Fiordland crested penguin	1								
Flesh-footed shearwater	1								
Gibson's albatross	1								
Grey petrel	1			3	1			3	
NZ white-capped albatross	2				1				
Salvin's albatross	4		1	3	1	2			
Sooty shearwater	1			2					
Southern royal albatross	1								
Spotted shag					1				
Stewart Island shag					1				
Wandering albatross (unidentified)		1							
Westland petrel				1	1			2	
White-chinned petrel	4		1	1	1				
TOTAL	21	1	3	21	13	2	0	7	1
% TOTAL	36.8	1.8	5.3	36.8	22.8	3.5		12.8	1.8

Table 6 Gizzard contents of seabirds killed and returned on fishing vessels between 1 July 2018 and 31 December 2018.Note: Birds can have multiple items in the gizzard resulting in higher content figures than the total number of seabirds killed and returned ($n = 57$).

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	2								
Buller's albatross			3	1	1	4			2
Campbell albatross	1								
Chatham Island albatross			2	1		4		1	2
Fairy prion			1						
Fiordland crested penguin	1								
Flesh-footed shearwater							1		1
Gibson's albatross					1				
Grey petrel			5	2		4		4	1
NZ white-capped albatross				3	3	2			
Salvin's albatross	4		3	3	3	2			
Sooty shearwater	1		2	1			2		
Southern royal albatross			1		1				
Spotted shag	1								
Stewart Island shag	1								
Wandering albatross (unidentified)		1							
Westland petrel			3	1	1			1	
White-chinned petrel			3	2	1	4			
TOTAL	11	1	27	14	12	23	3	6	6
% TOTAL	19.3	1.8	47.4	24.6	21.1	40.4	5.3	10.5	10.5

Table 7 Comparison of fat scores in the returned birds between 1 July 2018 and 31 December 2018 (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		1			3.0 ± 1.0
Buller's albatross	3	2	1				1.7 ± 0.3
Campbell albatross	1						1.0 ± 1.0
Chatham Island albatross	1	2			1		2.5 ± 0.9
Fairy prion			1				3.0 ± 3.0
Fiordland crested penguin			1				3.0 ± 3.0
Flesh-footed shearwater			1				3.0 ± 3.0
Gibson's albatross	1						1.0 ± 1.0
Grey petrel	1	3		1			2.2 ± 0.5
NZ white-capped albatross		1	1		1		3.3 ± 0.9
Salvin's albatross		1	4	3	1	1	3.4 ± 0.4
Sooty shearwater	1		2				2.3 ± 0.7
Southern royal albatross	1						1.0 ± 1.0
Spotted shag	1						1.0 ± 1.0
Stewart Island shag	1						1.0 ± 1.0
Wandering albatross (unidentified)						1	
Westland petrel	1	1	1				2.0 ± 0.6
White-chinned petrel	1	3		2		1	2.5 ± 0.5
TOTAL	15	16	13	7	3	3	2.4 ± 0.2
% TOTAL	26.3	28.1	22.8	12.3	5.3	5.3	

Examination of photographs and COD gave a total of 73 birds that were reported captured (i.e. *Interaction*; $n = 45$) or photographed (i.e. *Photo*; $n = 28$) as seabird interactions from this period with 27 fishing vessels (63 seabirds on trawl and ten on longline 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 December 2018.

	Dead	Alive	Total
Photographed and listed in MPI COD extract	16	9	25
Photographed but not listed in MPI COD extract to date	0	1	1
Photographed and listed in MPI COD extract, but image not received to date	1	1	2
Listed as an interaction only in MPI COD extract, but not photographed	6	39	45
Total	23	50	73
% Total	31.5%	68.5%	

Of the 25 birds that are listed in the COD extract and with photographs, 17 (68%) were identified correctly by the observers, four (16%) were identified to the correct group and four (16%) were identified incorrectly (a fairy prion, two grey petrels 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 shown 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 December 2018.
 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).

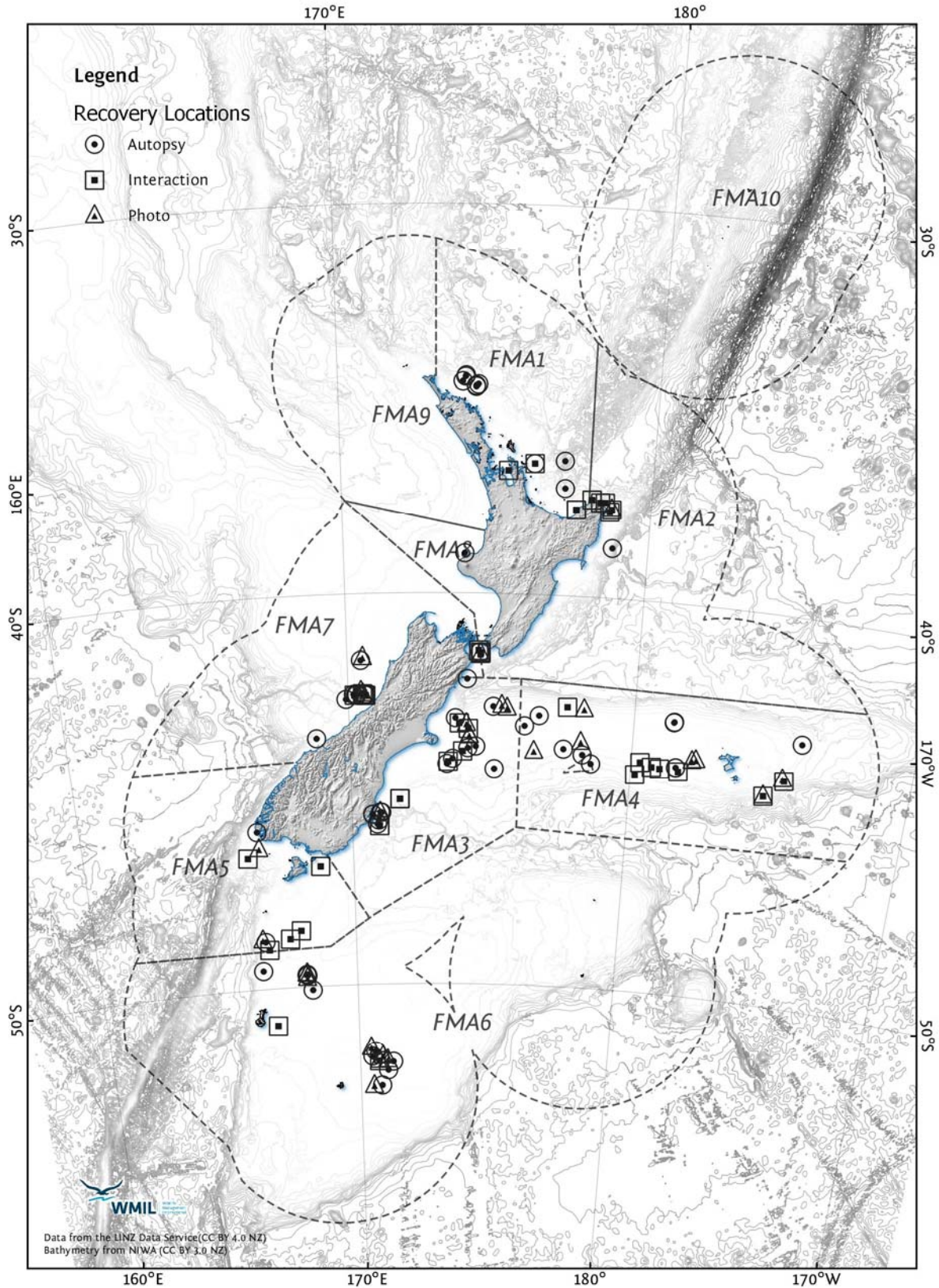


Figure 2 Grouped catch locations of all seabirds killed and returned for necropsy, photographed and/or reported as interactions in New Zealand fisheries between 1 July 2018 and 31 December 2018.

