

6. Discussion

6.1 MIDDLE DEPTH TRAWL FISHERIES

6.1.1 Hake, hoki, ling and silver warehou

Historically, levels of observer coverage in this fishery have generally been around 15% of total fishing effort, due to priorities of both DOC and the Ministry of Fisheries to monitor various aspects of fishing activity. During the 2007/08 observer year, 20% of total fishing effort was observed. In all FMAs in which there was considerable commercial fishing activity for hake, hoki, ling or silver warehou, some level of observer coverage was achieved. The greatest level of observer coverage was in SUB and the lowest was in CEE.

Moderate numbers of seabirds and NZ fur seals have been reported as being incidentally caught by vessels using the method of middle depth trawl to target hoki, hake, ling and silver warehou. Captures of seabirds and marine mammals have been reported from most areas where there has been observer effort. As in previous years, during 2007/08 the highest rate of seabird captures was reported from SEC and the highest rate of pinniped capture was in CEE, where NZ fur seals were caught on the CEE-CHA boundary in Cook Strait.

Seabird mitigation devices are mandatory for all trawlers that are greater than 28m in total length. Further research continues on offal management measures. This research has provided, and will continue to provide, management information that will help to minimise the risk of seabird interactions, especially warp captures, which are exacerbated by fish waste discharge. Results of this work will shed light on how to address warp captures in SEC and other areas. The quantity of offal produced in this fishery compared with the squid fishery presents greater challenges for offal management. Fur seal mitigation devices are being trialled and observer reports of seabird net captures have been investigated to help determine the feasibility of mitigating against net captures during setting and hauling.

6.1.2 Southern blue whiting

The southern blue whiting fishery operates in a discrete space and time, and has higher levels of observer coverage than most other trawl fisheries. During the 2007/08 observer year, 35% of total fishing effort was observed. Of note in this fishery is the increasing numbers of marine mammal captures over the last 4 observer years, particularly the capture of NZ sea lions. The capture rate of seabirds was similar in 2007/08 to the previous observer year, but has increased slowly over the last 4 observer years.

No mitigation devices or operational procedures are currently in place in this fishery to reduce the likelihood of pinniped interactions, even though interaction rates are higher than in other trawl fisheries where mitigation is employed or being developed. The deployment of specific devices intended to reduce interactions between seabirds and trawl warps is mandatory for all trawlers > 28 m in length in this fishery.

6.1.3 Scampi

The scampi fishery has historically had poor observer coverage, although levels are slowly increasing due to wider interest in gaining observer coverage in this fishery (this was previously observed solely through CSP). During the 2007/08 observer year, low observer coverage was achieved in SOE and SUB, despite high levels of commercial fishing effort in these FMAs. Greater levels of observer coverage were achieved in AKE, CEE and SEC. In future observer years, higher levels of observer coverage in SOE and SUB would be desirable in this fishery, given the number of seabird captures and occasional NZ sea lion captures that occur there.

The seabird capture rate was lower during the 2007/08 observer year than in the previous 3 observer years. Historically, seabird interactions have most frequently been reported in AKE, SOE and SUB, where the majority of observer coverage has been focussed. During 2007/08, most seabird captures were in AKE and SOE. A variety of seabird mitigation devices are employed by scampi vessels, although many do not meet regulated specifications as they are not required to do so due to vessel length. Seabird mitigation research on scampi vessels less than 28 m in length will occur in 2009/10.

6.1.4 Squid

Levels of observer coverage have generally been above 20% for squid vessels operating in SOU or SUB due to priorities of both DOC and the Ministry of Fisheries to monitor protected species interactions in this fishery. Historical high capture rates of seabirds in SEC are of concern, considering minimal observer coverage has been achieved in this area. Therefore, increased observer coverage is warranted for squid vessels operating in SEC, especially considering the high number of commercial effort days reported relative to other FMAs.

In 2007/08, and previous observer years, the squid fishery operating in both SOU and SUB was found to have the highest rate of seabird captures of all trawl fisheries. While seabird capture rates decreased from 2004/05 to 2006/07, with reductions in albatross captures being most notable, the capture rate in 2007/08 was similar to that reported in 2006/07.

Vessels operating in this fishery are required to use regulated seabird mitigation devices. Collaborative research between the Government and the fishing industry, and the development of discharge management measures has led to changes in offal management. (Offal and discard discharge is the greatest cause of warp captures in this fishery.) In addition, mitigation options for net captures are currently being investigated, as these continue to be a concern.

6.2 PELAGIC TRAWL FISHERIES

Although commercial effort targeting pelagic fish stocks has been undertaken in eight FMAs, observer coverage has generally been focussed in FMAs with the greatest levels of commercial effort. Observer effort has varied between FMAs over the last 4 observer years. In 2004/05, the greatest commercial fishing effort was in CHA, but relatively few observer days were achieved there compared with other areas (AKW, CEW and SOU); in 2005/06, good levels of observer coverage were achieved in four FMAs; and by the 2006/07 observer year, coverage was spread between eight FMAs. In 2007/08, the greatest numbers of observer days were achieved in AKW, CEW and CHA, and the highest levels of observer coverage were in AKW, CEW and SOU.

The most notable protected species interaction in pelagic trawl fisheries was the multiple captures of common dolphins, with 22 captures reported in December across three observed vessels. In general, a few vessels contribute to such capture events in this fishery, while other vessels report no captures. Seabird captures were greatest on vessels operating in SOU. While vessels over 28 m in length are required to use bird mitigation devices, no mitigation devices are currently in place to avoid capturing common dolphins and no research into this is presently underway.

6.3 DEEP-WATER BOTTOM TRAWL FISHERIES

Historically, around 20% of total fishing effort has been observed in deep-water bottom trawl fisheries, mostly because of Ministry of Fisheries priorities in relation to stock management. High levels of observer coverage were achieved in SOE, SUB and AKE during the 2007/08 observer year, with 35% of total fishing effort observed.

Fewer seabird and marine mammal captures were reported from this fishery compared with other trawl fisheries. Of interest is the capture of two seabirds on the paravane³, which is not always easily or consistently observed. Several vessels discharged offal during setting and hauling, though no seabird captures were reported.

6.4 INSHORE FISHERIES

The development of an inshore observer programme to monitor interactions with protected species is progressing, but there are still difficulties associated with monitoring small setnet, trawl and bottom longline vessels. Ongoing difficulties include the higher cost of placing observers on inshore vessels, access to vessels, the difficulties of vessels accommodating an observer on board and the weather dependence of these fisheries. In addition, conflicting priorities for the small pool of government observers makes it difficult to meet all monitoring requirements. Information gained in these fisheries to date indicates that interactions with seabirds and marine mammals do occur, but the extent of those

³ Steel paravanes (trawl doors) are adjusted to 'fly' through the water in opposite directions and hold the mouth of the trawl net open.

interactions is currently unknown. An increased understanding of the range of gears and deployment techniques used in inshore fisheries will contribute to the development of mitigation measures.

6.4.1 Inshore trawl

Ten inshore trawl vessels were observed during the 2007/08 observer year through four FMAs. Less than 0.5% of total fishing effort was observed, making it difficult to generalise about interactions between inshore trawl vessels and protected species. However, the interactions that were seen demonstrate that inshore trawl fishing presents a risk to protected species (at least in some areas or during certain times of the year), especially given the relatively high capture rate of seabirds. The broader extent of this risk is unknown. In contrast to the 2006/07 observer year, when net captures were reported in AKE, in 2007/08 seabird captures were only reported from the east and west coasts of the South Island, and all mortalities were the result of warp strikes.

Avenues for future research in this fishery include offal management, net capture mitigation techniques and the potential to use mitigation devices to reduce warp strikes. While many vessels employ no mitigation devices, home-made devices are in use in some areas and research trials will be undertaken in 2009/10 to investigate the efficacy of some devices.

6.4.2 Inshore bottom longline—ling, bluenose, hapuku and bass

While commercial effort in this fishery is undertaken throughout the year and in all FMAs except KER, very low observer coverage has been achieved to date. During the 2007/08 observer year, less than 3% of total fishing effort was observed; the highest level of coverage was in SOE, where 8% of fishing effort was observed.

Considering the fact that 63 seabirds were observed captured with minimal observer effort, there is a need to increase monitoring levels in this fishery. While there is scope for higher levels of observer coverage, many of the difficulties in placing observers in this fishery will need to be overcome before this can be achieved, including the development of better communication networks with vessel managers and operators, and addressing capacity issues in the observer programme. Avenues for mitigation and protected species research in this fishery include the development of best practice line-weighting regimes given variable gear types and deployment patterns, safe turtle handling and release practices, and offal and discard management practices.

6.4.3 Setnet

During the 2005/06 and 2006/07 observer years, less than 1% of total fishing effort was observed in the setnet fishery. This was increased to 2.5% of total fishing effort observed in the 2007/08 observer year, with 25% of fishing effort in SOU observed. Of concern in this fishery is the third capture of a yellow-eyed penguin in the last 2 years and the second capture of a Hector's dolphin, although there is some uncertainty surrounding this latter incident as the specimen was not recovered. Due to the low number of observer days achieved, the extent of such interactions across the setnet fishery as a whole cannot be determined. Combined efforts with the Ministry of Fisheries Hector's dolphin summer observer programme is likely to provide more extensive data on the nature and extent of seabird and marine mammal captures in setnet fisheries.

6.5 SURFACE LONGLINE FISHERIES

6.5.1 Charter tuna

Higher levels of observer coverage are achieved aboard charter tuna vessels than any other fishing fleet due to the small number of vessels operating in this fishery, high operator cooperation, and the capacity for vessels to accommodate observers. Two of four vessels operating in the New Zealand EEZ were observed during the 2007/08 observer year, allowing over 50% of total fishing effort to be observed. As in 2006/07, relatively high levels of seabird captures were reported in 2007/08, despite vessels employing multiple mitigation techniques including tori lines, acoustic cannons, weighted gear and bait retention practices.

6.5.2 Domestic tuna and swordfish

Domestic tuna vessels are difficult to observe as they have similar restrictions to other small vessels, as outlined previously. Less than 5% observer coverage was achieved during the 2004/05, 2005/06 and 2006/07 observer years. The recently introduced requirement for these vessels to provide notice of departure to the observer programme has facilitated the achievement of greater observer coverage more recently, and is expected to continue to do so in future years. During the 2007/08 observer year, observer coverage increased to 8% of total effort, and almost 20% of fishing effort in KER was observed.

Despite the low levels of coverage, protected species interactions have been reported in this fishery, including interactions with seabirds, marine mammals and marine reptiles. The capture rate of seabirds in 2007/08 was lower than that reported in 2006/07, although this may have been affected by the large capture event aboard one vessel in the 2006/07 observer year. Mitigation research continues in this field and includes testing the efficacy of blue-dyed bait.

6.6 BOTTOM LONGLINE FISHERY

Historically, between 20% and 30% observer coverage has been achieved in the bottom longline fishery due to the small number of vessels operating, high operator cooperation and the capacity for vessels to accommodate observers. Almost 30% observer coverage was achieved in 2007/08.

The deep-sea bottom longline fishery had a lower rate of seabird captures than the surface longline fisheries during the 2007/08 observer year. Seabird interactions were reported in two of the three FMAs where observer coverage was undertaken (SOU and SUB). Although large capture events have occasionally occurred in this fishery in the past, the rate of seabird captures has remained fairly steady over the last 4 observer years, with fewer birds having been reported captured in the last 2 observer years.

Mitigation techniques are well developed in the deep-sea bottom longline fishery and include tori lines, integrated weighted line and offal management. Few vessels operate in this fishery, allowing greater knowledge to be gained on fishing and mitigation practices that may be useful on smaller bottom longline vessels.

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Appendix 1

COMMON NAMES, SCIENTIFIC NAMES AND CODES OF SPECIES MENTIONED IN THIS REPORT

TABLE A1.1. FISH.

CODE	COMMON NAME	SCIENTIFIC NAME
BAR	Barracouta	<i>Thyrsites atun</i>
BIG	Bigeye tuna	<i>Thunnus obesus</i>
BNS	Bluenose	<i>Hyperoglyphe antarctica</i>
EMA	Blue mackerel	<i>Scomber australasicus</i>
HAK	Hake	<i>Merluccius australis</i>
HOK	Hoki	<i>Macruronus novaezelandiae</i>
HPB	Hapuku and bass	<i>Polyprion oxygeneios, P. americanus</i>
JMA	Jack mackerel	<i>Trachurus declivis, T. murphyi, T. novaezelandiae</i>
LIN	Ling	<i>Genypterus blacodes</i>
OEO	Oreo	Oreosomatidae (Family)
ORH	Orange roughy	<i>Hoplostethus atlanticus</i>
SBW	Southern blue whiting	<i>Micromesistius australis</i>
SCH	School shark	<i>Galeorhinus galeus</i>
SCI	Scampi	<i>Metanephrops challengeri</i>
SNA	Snapper	<i>Pagrus auratus</i>
SPD	Spiny dogfish	<i>Squalus acantbias</i>
SPO	Rig	<i>Mustelus lenticulatus</i>
SQU	Arrow squid	<i>Nototodarus sloanii, N. gouldi</i>
STN	Southern bluefin tuna	<i>Thunnus maccoyii</i>
SWA	Silver warehou	<i>Seriotelella punctata</i>
SWO	Swordfish	<i>Xipbias gladius</i>
TAR	Tarakihi	<i>Nemadactylus macropterus; Nemadactylus sp.</i> (“King Tarakihi”)
WAR	Common warehou	<i>Seriotelella brama</i>
WWA	White warehou	<i>Seriotelella caerulea</i>

TABLE A1.2. SEABIRDS.

COMMON NAME	SCIENTIFIC NAME
Albatross (unidentified)	Diomedeidae (Family)
Antipodean albatross	<i>Diomedea antipodensis antipodensis</i>
Black-browed albatross (unidentified)	<i>Thalassarche melanophbris</i> or <i>T. impavida</i>
Black petrel	<i>Procellaria parkinsoni</i>
Buller's albatross	<i>Thalassarche bulleri</i>
Campbell albatross	<i>Thalassarche impavida</i>
Cape petrel	<i>Daption capense</i>
Chatham albatross	<i>Thalassarche eremita</i>
Common diving petrel	<i>Pelecanoides urinatrix</i>
Erect-crested penguin	<i>Eudyptes sclateri</i>
Fairy prion	<i>Pachyptila turtur</i>
Flesh-footed shearwater	<i>Puffinus carneipes</i>
Fluttering shearwater	<i>Puffinus gavia</i>
Giant petrel	<i>Macronectes</i> spp.
Gibson's albatross	<i>Diomedea antipodensis gibsoni</i>
Grey-backed storm petrel	<i>Garrodia nereis</i>
Grey-faced petrel (Great winged)	<i>Pterodroma macroptera</i>
Grey petrel	<i>Procellaria cinerea</i>
Indian yellow-nosed albatross	<i>Thalassarche carteri</i>
Petrel (unidentified)	Procellariidae (Family)
Prion (unidentified)	<i>Pachyptila</i> spp.
Red-billed gull	<i>Larus novaehollandiae</i>
Salvin's albatross	<i>Thalassarche salvini</i>
Shy albatross*	<i>Thalassarche cauta</i>
Sooty shearwater	<i>Puffinus griseus</i>
Southern black-browed albatross	<i>Thalassarche melanophbris</i>
Southern royal albatross	<i>Diomedea epomophora</i>
Storm petrel	Hydrobatidae (Family)
Wandering albatross	<i>Diomedea exulans</i>
Westland petrel	<i>Procellaria westlandica</i>
White-capped albatross	<i>Thalassarche steadi</i>
White-chinned petrel	<i>Procellaria aequinoctialis</i>
White-faced storm petrel	<i>Pelagodroma marina</i>
Yellow-eyed penguin	<i>Megadytes antipodes</i>

* Historically, white-capped albatrosses (*Thalassarche steadi*) were reported by observers under a general code for shy albatrosses (*T. cauta*). Some observers still use this code, although these birds are most likely to be white-capped albatrosses.

TABLE A1.3. MARINE MAMMALS.

COMMON NAME	SCIENTIFIC NAME
Bottlenose dolphin	<i>Tursiops truncatus</i>
Common dolphin	<i>Delphinus delphis</i>
Dusky dolphin	<i>Lagenorhynchus obscurus</i>
Hector's dolphin	<i>Cephalorhynchus hectori</i>
Maui's dolphin	<i>Cephalorhynchus hectori maui</i>
New Zealand (NZ) fur seal	<i>Arctocephalus forsteri</i>
New Zealand (NZ) sea lion	<i>Phocarctos hookeri</i>
Orca	<i>Orcinus orca</i>
Pilot whale	<i>Globicephala melas</i>

TABLE A1.4. REPTILES.

COMMON NAME	SCIENTIFIC NAME
Leatherback turtle	<i>Dermochelys coriacea</i>

TABLE A1.5. PROTECTED FISH SPECIES.

COMMON NAME	SCIENTIFIC NAME
Spotted black grouper	<i>Epinephelus daemeli</i>
White pointer shark	<i>Carcharodon carcharias</i>

Appendix 2

PROTECTED SPECIES INTERACTIONS DURING THE 2007/08 OBSERVER YEAR

See Appendix 1 for scientific names of species.

SPECIES	DEAD	ALIVE	DECOMPOSED	TOTAL
PROTECTED FISH				
Spotted black grouper	1			1
White pointer shark	1			1
Protected fish total	2			2
SEABIRDS				
Albatross (unidentified)	2	7		9
Antipodean albatross	5			5
Black-browed albatross (unidentified)	1	1		2
Black petrel	3			3
Buller's albatross	26	12		38
Campbell albatross	7			7
Cape petrel	4	9		13
Chatham albatross	12			12
Common diving petrel		3		3
Fairy prion	2	1		3
Flesh-footed shearwater	7			7
Giant petrel	4	1		5
Gibson's albatross	2			2
Grey-backed storm petrel		1		1
Grey-faced petrel	6			6
Grey petrel	19	1		20
Indian yellow-nosed albatross	1			1
Petrel (unidentified)	6	12		18
Prion (unidentified)		5		5
Salvin's albatross	33	5		38
Seabird (large)		1		1
Seabird (small)		2		2
Shy albatross*	3			3
Sooty shearwater	71	38		109
Southern black-browed albatross	1			1
Southern royal albatross	1			1
Storm petrel		4		4
Wandering albatross (unidentified)		5		5
Westland petrel		4		4
White-capped albatross	42	9	5	56
White-chinned petrel	61	10	3	74
White-faced storm petrel		3		3
Yellow-eyed penguin	1			1
Seabird total	320	134	8	462

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Appendix 2—continued

SPECIES	DEAD	ALIVE	DECOMPOSED	TOTAL
MARINE MAMMALS				
Common dolphin	20			20
Hector's dolphin	1			1
NZ fur seal	76	22	2	100
NZ sea lion	11			11
Pilot whale		1		1
Whale (unidentified)			1	1
Marine mammal total	108	23	3	134
MARINE REPTILES				
Leatherback turtle		1		1
Marine reptile total		1		1
Total protected species interactions	430	158	11	599

* Historically, white-capped albatrosses (*Thalassarche steadi*) were reported by observers under a general code for shy albatrosses (*T. cauta*). Some observers still use this code, although these birds are most likely to be white-capped albatrosses.

Appendix 3

PROTECTED SPECIES INTERACTIONS BY METHOD DURING THE 2007/08 OBSERVER YEAR

See Appendix 1 for scientific names of species.

SPECIES	BOTTOM LONGLINE	SURFACE LONGLINE	SETNET	TRAWL	TOTAL
PROTECTED FISH					
Spotted black grouper				1	1
White pointer shark				1	1
Protected fish total				2	2
SEABIRDS					
Albatross (unidentified)	1			8	9
Antipodean albatross		5			5
Black-browed albatross (unidentified)		1		1	2
Black petrel	3				3
Buller's albatross	4	19		15	38
Campbell albatross	3	3		1	7
Cape petrel	4	1	1	7	13
Chatham albatross	12				12
Common diving petrel				3	3
Fairy prion				3	3
Flesh-footed shearwater		2		5	7
Giant petrel				5	5
Gibson's albatross		2			2
Grey-backed storm petrel				1	1
Grey-faced petrel	6				6
Grey petrel	1	16		3	20
Indian yellow-nosed albatross	1				1
Petrel (unidentified)		1		17	18
Prion (unidentified)				5	5
Salvin's albatross	22	3		13	38
Seabird (large)				1	1
Seabird (small)				2	2
Shy albatross*				3	3
Sooty shearwater	6		1	102	109
Southern black-browed albatross		1			1
Southern royal albatross				1	1
Storm petrel				4	4
Wandering albatross (unidentified)	1	2		2	5
Westland petrel			3	1	4
White-capped albatross		3		53	56
White-chinned petrel	10	4		60	74
White-faced storm petrel				3	3
Yellow-eyed penguin			1		1
Seabird total	74	63	6	319	462

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Appendix 3—continued

SPECIES	BOTTOM LONGLINE	SURFACE LONGLINE	SETNET	TRAWL	TOTAL
MARINE MAMMALS					
Common dolphin				20	20
Hector's dolphin			1		1
NZ fur seal		14	1	85	100
NZ sea lion				11	11
Pilot whale			1		1
Whale (unidentified)				1	1
Marine mammal total		14	3	117	134
MARINE REPTILES					
Leatherback turtle		1			1
Marine reptile total		1			1
Total protected species interactions	74	78	9	438	599

* Historically, white-capped albatrosses (*Thalassarche steadi*) were reported by observers under a general code for shy albatrosses (*T. cauta*). Some observers still use this code, although these birds are most likely to be white-capped albatrosses.

Appendix 4

PROTECTED SPECIES INTERACTIONS BY MONTH DURING THE 2007/08 OBSERVER YEAR

See Appendix 1 for scientific names of species.

SPECIES CODE	2007						2008						TOTAL
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
PROTECTED FISH													
Spotted black grouper	1												1
White pointer shark									1				1
Protected fish total	1								1				2
SEABIRDS													
Albatross (unidentified)			2		1			5		1			9
Antipodean albatross	1									3		1	5
Black-browed albatross (unidentified)	1					1							2
Black petrel											3		3
Buller's albatross	4				1		1	4	1	10	13	4	38
Campbell albatross	2			1						1	3		7
Cape petrel	4	2	3	2	1							1	13
Chatham albatross			12										12
Common diving petrel	2										1		3
Fairy prion					1				1			1	3
Flesh-footed shearwater						1		2	3	1			7
Giant petrel		3								1	1		5
Gibson's albatross	1						1						2
Grey-backed storm petrel								1					1
Grey-faced petrel											6		6
Grey petrel	9	8	1	1								1	20
Indian yellow-nosed albatross		1											1
Petrel (unidentified)	1				1			5	9		2		18
Prion (unidentified)		2	1	1		1							5
Salvin's albatross	1		24	5	4	2		1				1	38
Seabird (large)			1										1
Seabird (small)							1	1					2
Shy albatross*	2									1			3
Sooty shearwater				18	7	8	2	49	14	10	1		109
Southern black-browed albatross	1												1
Southern royal albatross								1					1
Storm petrel				1	1				1	1			4
Wandering albatross (unidentified)	1		1					1			1	1	5
Westland petrel				1	3								4
White-capped albatross	1	2			1	1		9	28	13	1		56
White-chinned petrel				4	1	1	2	27	16	20	3		74
White-faced storm petrel						3							3
Yellow-eyed penguin						1							1
Seabirds total	31	18	45	34	22	19	7	106	73	62	35	10	462

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Appendix 4—continued

SPECIES CODE	2007						2008						TOTAL
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
MARINE MAMMALS													
Common dolphin						20							20
Hector's dolphin								1					1
NZ fur seal	14	28	10	16	3		2	6		2	6	13	100
NZ sea lion			3	3					4	1			11
Pilot whale							1						1
Whale (unidentified)				1									1
Marine mammal total	14	28	13	20	3	20	3	7	4	3	6	13	134
MARINE REPTILES													
Leatherback turtle											1		1
Marine reptile total											1		1
Total protected species interactions	46	46	58	54	25	39	10	113	78	65	42	23	599

* Historically, white-capped albatrosses (*Thalassarche steadi*) were reported by observers under a general code for shy albatrosses (*T. cauta*). Some observers still use this code, although these birds are most likely to be white-capped albatrosses.

Appendix 5

PROTECTED SPECIES INTERACTIONS BY FISHERIES MANAGEMENT AREA DURING THE 2007/08 OBSERVER YEAR

See Appendix 1 for scientific names of species.

SPECIES	1. AKE	2. CEE	3. SEC	4. SOE	5. SOU	6. SUB	6A. SOI	7. CHA	8. CEW	9. AKW	10. KER	TOTAL
PROTECTED FISH												
Spotted black grouper										1		1
White pointer shark							1					1
Protected fish total	0	0	0	0	0	0	1	0	0	1	0	2
SEABIRDS												
Albatross (unidentified)			1	2	5	1						9
Antipodean albatross	2	3										5
Black-browed albatross (unidentified)	1	1				1						3
Black petrel	2											2
Buller's albatross	1	2	4	3	20			8				38
Campbell albatross	4	2				1						7
Cape petrel		2	2	2				7				13
Chatham Island albatross				12								12
Common diving petrel				1				2				3
Fairy prion			1		1		1					3
Flesh-footed shearwater	4	2	1									7
Giant petrel				1		1		3				5
Gibson's albatross	1	1										2
Grey-backed storm petrel					1							1
Grey-faced petrel	6											6
Grey petrel		16		1		3						20
Indian yellow-nosed albatross		1										1
Petrel (unidentified)	1		3		7	1	6					18
Prion (unidentified)								3	1	1		5
Salvin's albatross		3	5	26		4						38
Seabird large						1						1
Seabird small					1	1						2
Shy albatross*			2					1				3
Sooty shearwater	14		3	1	62	4	13	12				109
Southern black browed albatross		1										1
Southern royal albatross					1							1
Storm petrel			1	1	1	1						4
Wandering albatross (unidentified)	2	1		1	1							5
Westland petrel			4									4

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Appendix 5—continued

SPECIES	1. AKE	2. CEE	3. SEC	4. SOE	5. SOU	6. SUB	6A. SOI	7. CHA	8. CEW	9. AKW	10. KER	TOTAL
White-capped albatross	1		3		20	2	28	2				56
White-chinned petrel			6	3	34	12	19					74
White-faced storm petrel									2	1		3
Yellow-eyed penguin					1							1
Seabirds total	39	35	36	54	155	32	68	38	3	2	0	462
MARINE MAMMALS												
Common dolphin									3	17		20
Hector's dolphin			1									1
NZ fur seal		19	7		15	28	8	23				100
NZ sea lion					2	9						11
Pilot whale										1		1
Whale (unidentified)					1							1
Marine mammal total	0	19	8	0	15	31	17	23	3	18	0	134
MARINE REPTILES												
Leatherback turtle											1	1
Marine reptile total	0	0	0	0	0	0	0	0	0	0	1	1
Total protected species interactions	39	54	44	54	170	63	86	61	6	21	1	599

* Historically, white-capped albatrosses (*Thalassarche steadi*) were reported by observers under a general code for shy albatrosses (*T. cauta*). Some observers still use this code, although these birds are most likely to be white-capped albatrosses.

Appendix 6

OBSERVER COMMENTS FROM OBSERVED VESSELS AND TRIPS IN EACH FISHERY DURING THE 2007/08 OBSERVER YEAR

See Appendix 1 for scientific names of species.

AC = acoustic cannon, BB = bird baffler, DB = dyed bait, DH = deck hose,
IWL = integrated weighted line, LW = line weighting, NS = night setting,
PI = pinger, SL = Sea Lion Exclusion Device, TL = tori line, WS = warp scarer.

TABLE A6.1. HAK, HOK, SWA, LIN MIDDLE DEPTH TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	3	1. CHA 2. CHA 3. CHA	Vessel has meal plant, so little offal discharge and not during shooting or hauling.	BB	Accompanied vessel at all times. Numbers increased dramatically during hauling, especially when codend approached surface.	N N N	NZ fur seals feeding on escaped fish.	N N N
2	1	1. CHA	Factory wash all the time but not a problem during shooting or hauling.	TL or WS	No problems with birds.	N	A couple of NZ fur seals spotted as net coming up stern ramp.	N
3	2	2. SUB, SOU, SEC	Meal plant operated. Only discarded material was factory floor wash, hoki skins and dropped fish or waste. Discarding of offal and whole fish occurred in SEC.	TL	Feeding aggressively from codend, especially in SOU and SEC.	Y	NZ fur seals seen feeding from net on stickers and on hoki skins.	N
4	2	1. SUB 2. SOE, SEC	None discharged as meal plant on board.	BB (TL backup)	Seabirds present throughout trip, arriving in numbers at hauling. Frenetic feeding on fish dropping from net.	N N	NZ fur seals seen occasionally.	Y N
5	1	1. SUB, CHA	Meal plant on board, small particles discharged.	BB	More seabirds seen when fishing SUB. Cape petrels feeding on very small particles from meal plant. Larger birds feeding from net and on discarded heads.	N	NZ fur seals regularly seen around vessel in SUB and CHA; all captures at night.	Y
6	3	1. SUB, SEC, CHA 2. SEC, SOE 3. SOU, SUB	Meal plant on board.	BB	Smaller birds feeding on water pumped from sumps. Bird numbers increased rapidly during hauling as birds feeding from codend, eating stickers and escaped whole fish. Crew cleaned net of stickers prior to shooting.	Y Y N	No specific comments.	N N N
7	1	1. CEE, CHA	No processing as vessel an ice boat. Only a very small amount of non-quota discarding during stowing of fish.	TL	Seabirds present throughout trip. While seabirds following vessel, they did not land close to stern and were not seen feeding.	N	No specific comments.	Y
8	3	1. SEC, CHA 2. SEC 3. SEC, SOE	Vessel operates a meal plant but still creates enough offal discharge to attract birds. Floor washings from fillet processing and skins are discharged during setting and hauling via scuppers and sumps.	TL	Seabirds more interested in hoki skin discards than the codend if the vessel was processing; otherwise they fed from the codend. At the time of seabird captures, hoki skins and floor washings were drifting into net meshes.	Y N Y	NZ fur seals fed from codend and on discarded hoki skins.	N Y N

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Table A6.1—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
9	1	1. CEE, CHA	No specific comments.	Not stated	Seabirds constantly present, especially at hauling when they fed aggressively on both the codend and fish floating free from the net.	N	Consistent presence of NZ fur seals, with numbers greatest at hauling, taking directly from codend or floating from net.	Y
10	1	1. SOU, SEC	Offal and bycatch discharged in batches.	TL	Seabirds accompanied vessel at all times. Seabird abundance increased during hauling and batch discharging.	N	No specific comments.	N
11	2	1. CHA 2. CHA	Most offal mealed, but overflowed on a few occasions. Deck wash when factory busy. Stickers removed from net.	TL	Seabird numbers increased during hauling, especially when codend approached surface.	Y	NZ fur seals feeding from codend and on lost fish. Hauling undertaken as quickly as possible, turns made with doors at surface.	N
12	3	1. SOU, SUB 2. SOU 3. SEC, CHA	Meal plant operated, but when at capacity offal discharged directly overboard. During hoki processing, deck wash flows out continuously. All ling viscera offal disposed of overboard and fed on voraciously by birds. During one trip no effort was made to contain offal discharge during shooting and hauling.	TL (WS when too windy)	Seabirds present at all times; maximum number while discharging offal. During the second trip, birds quieter than usual, fed from codend but not aggressively.	Y	No marine mammal sightings during second trip. NZ fur seals observed commonly on third trip, but little interest.	Y
13	2	1. CHA 2. SEC, SOU	During shooting and hauling factory floor wash continuously discharged.	TL	Seabirds feeding from codend and offal line.	Y	NZ fur seals feeding on livers in the offal line; no direct interaction with codend.	N
14	1	1. CEE, CHA	No specific comments.	None (vessel 22 m in length)	Seabirds constantly present, fed on fish spilling from codend, very aggressive. Ninety percent of fishing at night.	N	NZ fur seals a constant presence at haul. Up to 25 animals. Fed on fish escaping from codend.	Y
15	2	1. SEC, CHA 2. CHA	Offal discharged during shooting and hauling.	TL	Seabirds commonly seen around vessel both during hauling and while discharging during processing, with the greatest numbers interacting as the net surfaced, feeding aggressively.	N	NZ fur seals seen regularly in small numbers feeding on offal trail while factory processing. Crew member monitored for marine mammal activity.	N
16	2	1. SEC, SOE, CHA 2. SEC, SUB	Offal and whole fish discards frequently disposed of over the side during shooting and hauling. Net cleared of some stickers after hauling, but not thoroughly. No capacity for bulk retention of offal. Uncoordinated batch discharge scheme attempted.	BB, TL	Seabirds feeding from codend.	Y	NZ fur seals and NZ sea lions sighted; NZ fur seals feeding from codend.	Y

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Table A6.1—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
17	1	1. CHA	Meal plant on board, offal not discharged during shooting or hauling.	BB (TL, WS on board)	Seabirds scavenged around net during hauling and around sump/scuppers for offal at all times.	Y	Doors only hauled to 100 m during turns. NZ fur seals commonly observed.	Y
18	1	1. CEE, CHA	No offal discarding during shooting or hauling.	TL	Seabirds a constant presence at haul. Fed on lost fish and from codend. Feeding aggressively.	N	NZ fur seals a constant presence at haul, feeding aggressively on lost fish and taking fish from codend. Common dolphins a constant presence; up to 500; not seen feeding from net.	Y
19	2	1. CEE, CHA 2. CEE, CHA	Offal not discharged. Whole fish discarded from starboard side during processing.	BB	Seabirds flocked to stern as hauling began and fed aggressively from codend.	N	NZ fur seals seen occasionally swimming alongside vessel or feeding from codend.	Y N
20	1	1. SUB	Offal batch discarded.	TL	Bird abundance variable. Few birds followed vessel when no offal or discards. When batches discharged, birds followed the batch astern of the vessel.	Y	No specific comments.	Y
21	1	1. SOU, SUB	Batch discarding of discards and offal. When catching ling or hake, guts had to be continuously discarded.	TL	No specific comments.	N	Only a few sightings of NZ fur seals in SOU.	N
22	1	1. SOU, SUB	All unwanted species mealed. The only discards were warehou heads, which were stored in a hopper and discarded when the doors were up or no gear was in the water.	Not stated	Birds numbered from 300 to 1000 and numbers increased when no other vessels nearby.	N	NZ fur seals consistently present alongside the vessel in SOU.	Y
23	1	1. SOU, SUB	Minced offal discharged during 3% of hauls and 65% of shots.	TL	Seabird numbers peaked during offal discarding.	N	No specific comments.	N
24	2	1. CHA 2. SOU	No offal discharged during shooting or hauling.	BB (TL backup)	Seabirds ever present in numbers of 50–1500.	Y N	When fishing in the Hokitika trench and southwest on hake grounds, NZ fur seals were in constant attendance, following the codend from the surface to the stern ramp.	Y N
25	3	1. CHA 2. SEC, SUB, SOU 3. SEC, SOE	No offal discharged during hauling, but meal water often discharged.	BB (all tows), TL (some tows)	Seabirds present in low numbers, feeding from codend, and numbers increased during hauling.	N N	NZ fur seals seen occasionally, sometimes feeding on lost fish.	N Y

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Table A6.1—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
26	2	1. SEC, SOE, SUB, SOU 2. SOU, SEC	Not discharged during shooting or hauling, but whole fish and offal discarded during tows. Meal plant used.	BB, TL	Seabirds feeding from codend.	N	NZ fur seals and NZ sea lions feeding from codend.	Y
27	1	1. SUB	Offal and fish minced. Crew actively attempted to remove stickers. Rarely was any attempt made to hold or minimise discharge of minced fish and offal during shooting and hauling.	BB, TL	Discharging mince during turning was cause of seabird fatality. Observer felt mincing increased seabird foraging effort, competitive interactions and proximity of feeding attempts from nets. Gear events coincided with captures.	Y	No specific comments.	Y
28	2	1. CHA 2. SOU	During one trip, the vessel discharged during shooting but not hauling. During another trip, the vessel held during shooting and hauling and later offal and whole fish discards were minced and discharged during tows.	BB, TL	Seabirds commonly seen during hauling and while discharging waste; birds interacting as net surfaced.	Y	NZ fur seals seen in small numbers feeding on offal trail while factory processing during first trip. Marine mammals not sighted second trip.	N
29	1	1. CEE, CHA	Offal and whole fish discharged during towing. Stickers removed from net before shooting.	BB	Seabirds feeding aggressively from codend and on any floating fish.	N	NZ fur seals most commonly observed following and feeding from the net on hauling; numbers varied between 2 and 8. Actively fed on hoki from net.	Y
30	1	1. CEE, CHA	Whole fish discharged from the deck during processing and on some tows when offal was discharged.	None	Birds flocked towards codend and fed aggressively.	N	NZ furs seals seen on many occasions, often appearing shortly after hauling began and feeding from codend as it hung from stern.	Y
31	2	1. CHA, SEC 2. SEC	Vessel discharged during setting and hauling, but flow generally at a minimum at those times.	BB, TL	Birds commonly seen during hauling and processing; greatest numbers interacting as net surfaced.	N	No specific comments.	N
32	1	1. CHA, SOU	Vessel stopped discharge of offal and discard species during shooting and hauling.	BB	Seabirds followed vessel while hauling and processing fish, and during offal discharge.	Y	NZ fur seals seen around vessel six times; on one occasion, two fur seals seen feeding from codend.	N

TABLE A6.2. SOUTHERN BLUE WHITING TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	1	SUB	Vessel did not discharge offal as meal plant used throughout trip.	BB	Bird numbers, especially white-capped albatrosses, increased dramatically during hauling. Birds sometimes fed aggressively at codend.	N	NZ fur seals and NZ sea lions seen feeding regularly from codend. All NZ sea lions seen were male. During one night-time haul, around 20 NZ fur seals and male NZ sea lions were seen close by the stern as the codend was being hauled aboard. The codend contained few fish, but two NZ sea lions and two NZ fur seals. Another NZ fur seal was caught in the next tow.	Y
2	1	SUB	Vessel initially held offal, which was discharged from the port processing line out the scuppers. Later, offal was discharged during shooting and hauling.	TL, WS	Seabirds attracted to offal.	N	NZ sea lions and NZ fur seals were sighted in numbers ranging from 1 to 9 on occasion. Mammals seemed attracted to offal and then followed codend to surface.	Y
3	1	SUB	No offal discharge during shooting and hauling.	TL	Birds moved between vessels in the area. Although birds feeding from codend, no aggressive behaviour.	N	NZ fur seals seen four times in SUB; between 2 and 7 individuals following codend once it surfaced and feeding from net.	N
4	1	SUB	Vessel had meal plant. Factory floor sumps covered with grids to prevent offal and fish going overboard.	TL	Birds feeding from codend, not aggressive. Splices bound to cover any sprags on warps.	Y	When in SOI, NZ fur seal numbers ranged from 3 to 20 alongside vessel; feeding from codend during hauling. Five NZ fur seals and three NZ sea lions caught in last three tows.	Y
5	1	SUB	All offal waste was pumped directly overboard above waterline without mincing. No attempt was made to reduce or stop the discharge of offal during shooting or hauling.	TL (for 60% of tows due to bad weather, otherwise nothing)	Seabird activity highly variable depending on fishing area and offal discharge. The number of albatross was highest on Bounty and Pukaki grounds, but significantly less on Campbell Rise. When offal being discharged, bird numbers greatest, with 100s to 1000s of birds.	N	NZ fur seals seen regularly around vessel on Bounty platform. NZ sea lions seen on Campbell Rise.	Y
6	1	SUB	Factory wash during processing and hauling.	TL	Birds feeding from codend and offal line.	Y	Up to 30 NZ fur seals seen around the vessel in SUB (Bounties) during processing and hauling. Commonly observed feeding on livers in the offal line and no direct interaction with codend.	Y
7	2	SUB	As vessel processing to surtimi, large quantities of offal produced; therefore, not possible to stop discharge during shooting and hauling.	BB (not within 1 m of sea)	Seabirds continuously present during both trips, feeding on offal from port and starboard sumps. During haul, larger birds fed aggressively from the net while smaller birds continued to feed on offal.	N	During both trips, NZ fur seals were feeding from the codend and following the vessel. Headline below 100 m when turning.	Y

TABLE A.6.3. SCAMPI TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	2	1. CEE, SOE 2. SOE	Heads and offal usually collected in a hopper to be discarded when net at depth, but sometimes heads thrown as processing.	TL	Birds very aggressive over full moon period. Frenetic feeding when batch discarding from hopper occurred. The relatively short stretch of water (6-7 m) immediately along port side became embroiled with birds. At this time, tori line had scant deterrent effect. The mate protected birds physically with a short-handled plastic spade, which proved to be the most effective deterrent. Birds congregated during hauling, taking fish floating out of net.	Y N	Only four NZ fur seal sightings on one trip, not interacting.	N N
2	1	1. SOI	Vessel did not discharge waste during shooting until the doors were back in the water, and processing was always finished before the next hauling event.	TL	Seabirds commonly seen around the vessel during hauling, and while discharging during processing. Greatest number present when net on surface. Numbers peaked at 300 birds. Tori line deployed only during processing and actively fishing.	N	Small numbers of NZ sea lions sighted.	N
3	3	1. AKE 2. AKE 3. AKE	Vessel discharged during shooting of the net during some trips.	TL (no streamers) & WS (buoy attached to rope)	Birds constantly in attendance and numbers increased markedly from the start of hauling to when the net was on the surface; birds would stay around the vessel for the next 2 hours while the catch was processed, feeding on discards and offal. As numbers increased during the trip, the skipper deployed a warp scarer consisting of a buoy attached to a rope. A mixture of mitigation devices were used on this vessel including bird bafflers, tori line and a homemade warp scarer.	N Y Y	No specific comments.	N N N

TABLE A6.4. SQUID TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	1	1. SOU, SOI	Discharging of offal or other discards did not occur at shooting or hauling as vessel had holding bins.	BB SL	Bird numbers ranged from 100 to 500. Apart from feeding on squid offal from factory floor wash, there was little interaction with the vessel, except at hauling when squid floating free of the net were eaten.	Y	No specific comments.	N
2	1	1. SOU, SOI	There were a couple of instances when the vessel discarded offal whilst fishing due to the meal plant breaking down. Discarding of spiny dogfish occurred during some tows. Large bags of squid offal discarded once fishing stopped.	WS SL TL	Birds feeding voraciously from codend, diving at the net and fighting. Birds moving between vessels.	Y	No specific comments.	Y
3	1	1. SOU, SOI	Offal discharged during shooting and hauling in negligible amounts; this included gut remnants and tentacles.	TL SL	Birds fed on offal from factory floor wash and sump water; feeding aggressive. Petrels diving near vessel to collect sinking tentacles.	Y	Marine mammal sightings rare; dusky dolphins and NZ fur seals seen.	Y
4	1	1. SOU, SOI	Vessel mealed all waste so no offal discarding.	TL SL	Seabirds were present throughout the trip.	Y	NZ sea lions observed on two occasions following vessel.	Y
5	1	1. SOU, SOI	Vessel discharging offal and bycatch in batches.	TL SL	Seabird accompanied the vessel at all times. Seabird abundance increased during hauling and batch discharging.	Y	NZ sea lions observed seven times, usually feeding on escaped fish from codend.	Y
6	2	1. SOU, SOI 2. SOU, SOI	Vessel only discharged offal while towing, not during shooting or hauling.	TL, SL (WS backup)	Larger birds were 99% white-capped albatrosses, but royal albatrosses often present during hauling. Bird behaviour aggressive.	Y	During first trip on this vessel, female NZ sea lions were seen feeding on offal at stern. During the second trip, no marine mammals were sighted.	N N
7	1	1. SOU, SOI, SEC	During shooting/hauling factory floor wash was continuously discharged, in which minimal offal was observed on floor.	TL SL	No specific comments.	Y	No specific comments.	Y
8	2	1. SOU, SOI 2. SOU, SOI	Offal held during hauling and net hauled as quickly as possible. Vessel discharged minced offal during shooting on five tows and offal on two tows. During the second trip, the vessel discharged during shooting four times when the factory was processing tows with high non-quota bycatch.	TL SL	Seabirds followed vessel and congregated at stern during shooting and hauling to feed from net. During processing birds scavenged offal from cutter pumps.	Y Y	During tows, headline only 25 m below surface instead of 100 m. A few NZ sea lions and NZ fur seals seen during hauling.	N Y

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Table A6.4—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
9	1	1. SOU, SOI, CHA	Uncoordinated batch discharge scheme attempted.	BB, TL, SL	Between 60 and 300 birds around vessel. White-capped albatrosses feeding voraciously from codend.	Y	Nine marine mammal sightings, including NZ fur seals and NZ sea lions. Seen feeding from codend. NZ fur seal pup came up the stern ramp.	Y
10	2	1. SOU, SOI 2. SOU, SOI	When meal plant was full there were small amounts of offal discharge.	BB (TL backup), SL	Birds often dived into net/mesh to get squid or dived under net. When offal was discharged, bird strikes with warps were frequent and bird abundance increased.	Y	NZ fur seals seen occasionally in SOU.	Y N
11	1	1. SOU, SOI	Batch discarding.	TL, SL	Bird abundance variable. Few birds followed when there was no discard of offal or whole fish and when there was no sump discharge of fish particles. When batches discharged, birds followed the batch astern of the vessel. Birds also moving to other vessels.	Y	No specific comments.	Y
12	1	1. SOU, SOI	Vessel had specific code of practice. Batch discarding of offal and discards was followed. Offal limited when targeting squid compared with ling and hake.	TL, SL	Tori lines and batch discarding seemed to be an effective combination to limit warp strikes.	Y	Only a few sightings of marine mammals, all fur seals in SOU.	N
13	1	1. SOU, SOI	Vessel commonly discharged offal and whole fish while shooting and hauling.	TL, SL	Most seabird captures occurred during hauling. Seabirds numbered from 40 to 1000 each day and were greater when vessel discarding whole fish.	Y	Fur seals and NZ sea lions seen, eating whole fish discards.	N
14	1	1. SOU, SOI	No offal or fish discharged during hauls or sets.	BB, SL	Monitored bird activity for all hauls in daylight.	Y	No marine mammals sighted.	N
15	2	1. SOU, SOI 2. SOU, SOI	Offal batching trial undertaken on one trip. During the other trip, offal and heads were batched by vessel and released while not fishing, if possible, or mid-tow when fishing at night. Some fish species were discarded whole for two tows, as meal plant broken.	BB, TL, SL	Birds actively feeding on offal and from codend.	Y	On most days in SOI, 1–4 NZ sea lions were observed following vessel. During second trip on this vessel, NZ fur seals seen swimming behind or beside vessel. NZ sea lions seen around vessel, usually at night while vessel not fishing.	Y Y
16	1	1. SOU, SOI	Offal was held in the factory and batch discarded when holding tank full. Discharge intermittent but consistent during tow. Some whole fish discarded.	BB, NT, LN, AC, SL	Seabirds in constant attendance, especially when no meal plant operating. Aggressively feeding on all discharge from vessel. Acoustic cannon used during turning, shooting and hauling, or when headline at surface.	Y	Marine mammals not present in significant numbers. NZ sea lions seen on four occasions, with a maximum of three sighted at one time. All observations north of Auckland Islands.	Y

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Table A6.4—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS CAPTURE?	MARINE MAMMAL
17	1	1. SOU, SOI	On occasion, offal was discharged when shooting the net and during hauling.	BB, TL, SL	Warp strike observations undertaken on every tow; a single strike was noted.	N	NZ fur seals were seen three times, swimming/ foraging by discard chute, primarily on port side. A NZ sea lion was seen once in SOU behaving the same as the NZ fur seals.	MARINE MAMMAL
18	1	1. SOU, SOI	Offal and non-quota bycatch (NQBC) retained during shooting and hauling. During fishing or steaming, offal and NQBC held or minced. NQBC discharged when mincer jammed. Stickers removed prior to shooting.	TL, BB, SL	Large seabirds were feeding aggressively from the codend, on minced offal and NQBC. Small seabirds were feeding on floaters and diving around the headline during hauling, and fed on offal and NQBC.	Y	NZ fur seals observed were large males feeding on floaters during hauling.	N
19	1	1. SOU, SOI	Offal and whole fish discards were held during shooting and hauling, and were later minced and discharged during the tow.	BB, TL, SL	A flock of birds present every day. Warp strike observations were undertaken, with 95% occurring when the factory was discharging minced offal and whole fish, one heavy contact.	Y	Marine mammals not sighted around the vessel.	N

TABLE A6.5. PELAGIC TRAWL FISHERY—JACK MACKEREL AND BARRACOUTA.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	3	1. CEW 2. CHA, CEW, AKW 3. CHA, CEW, AKW	Vessel had a meal plant, so very little discharging and not during hauling or shooting.	BB	Bird numbers, especially white-capped albatrosses, increased dramatically during hauling, sometimes feeding aggressively at codend.	N	No marine mammals sighted in CEW, CHA or AKW during one trip. During the second trip, NZ fur seals and common dolphins were seen in CHA. NZ fur seals were present on 19% of tows, usually seen feeding on fish escaping from the codend. NZ fur seals also present on third trip.	Y
2	3	1. CHA, CEW 2. AKE, CEE, CHA, CEW, AKW 3. SOU, CHA, CEW	Had factory wash all the time but was not a problem during shooting and hauling. All byproducts meal and whole fish discards limited during shoot and haul.	TL or WS	Seabirds constantly following vessel and feeding on any fish lost through mesh during hauling. Numbers dramatically increased during hauling.	N	No specific comments.	N
3	2	1. CHA, CEW 2. CEW, AKW	Most offal meal, overflowed on a few occasions and was discarded. All stickers removed and hauling undertaken as quickly as possible.	TL	Birds followed vessel feeding on floor wash and offal. Densities increased during hauling. Vessel contacted shore when trigger points reached.	N	Turns made with doors on surface. During one trip when common dolphins were caught, dolphins had been observed swimming alongside the vessel on two occasions. Following captures, the vessel stopped fishing between 2300 h and 0100 h.	Y
4	4	1. CHA 2. CHA 3. CHA, SOU 4. SOU, CHA, CEW	Offal occasionally discharged, but rarely during hauling. Meal plant operated. Only discarded offal when meal plant 'couldn't cope'. Unwanted fish discarded at times other than shooting and hauling.	TL (WS backup)	Seabirds often seen feeding on fish that floated free or were in the wings of the net as net surfaced.	N	NZ fur seals observed showing little interest in fishing activities.	Y
5	3	1. SEC, CHA, CEW 2. CEW, AKW 3. SEC	During shooting/hauling factory floor wash was continuously discharged, in which minimal offal was observed on floor.	TL	Birds followed vessel and fed on discharge washed off factory floor through sump. Followed net in towards vessel, sometimes diving just behind codend. Some aggressive feeding.	N	No specific comments.	N
6	1	1. SEC, SOE	Offal and whole fish discards were frequently disposed of over the side during shooting and hauling. Net was cleaned of some stickers after hauling, but not thoroughly. No capacity for bulk retention of offal.	BB, TL	No specific comments.	Y	No specific comments.	N

Continued on next page

Table A6.5—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
7	1	1. CHA	Offal discharged during shooting and hauling.	TL	Seabirds commonly seen around vessel both during hauling and while discharging during processing, with the greatest numbers interacting as the net surfaced.	N	NZ fur seals regularly seen in small numbers feeding on the offal trail while the factory was processing. One crew member monitored for marine mammal activity.	N
8	3	1. SOU, CHA 2. CEW, AKW 3. CHA, CEW	Vessel had meal plant. Discarding only occurred when it was full, and offal was discharged when net on deck or during the tow when net on bottom. If shooting or hauling occurred when meal plant was full, processing would cease and offal would be held.	BB (TL, WS on board)	Birds would congregate during hauling and scavenged on any fish that fell from the net.	Y N Y	NZ fur seals commonly observed during a trip in CHA, feeding around net or foraging offal. 10–12 common dolphins seen swimming alongside the vessel once during one trip whilst fishing.	N N N
9	1	1. CHA	Minced offal was being discharged during 3% of hauls and 65% of shots.	TL	Bird numbers peaked during offal discarding.	N	Only marine mammals encountered were a pod of 30–40 common dolphins that followed vessel for 45 minutes.	N
10	3	1. CEW, AKW 2. CHA, CEW 3. SEC, SOU	Vessel had new screens for the sumps in the factory, which were very effective at preventing floor washings from going overboard. All offal minced and not discharged.	BB (TL backup)	Bird numbers increased during hauling. Birds fed on debris and small fish off the codend.	N N N	A blue whale (<i>Balaenoptera musculus</i>) was the only marine mammal sighting during one trip. On the other trip, the crew were very concerned about common dolphin captures and immediately steamed away from the area to avoid further captures.	Y N N
11	1	1. SOU	Offal and fish minced. Crew actively attempted to remove stickers. Rarely was any attempt made to hold or minimise discharge of minced fish and offal during shooting or turning.	BB, TL	Seabird abundances were variable, but greatest when shooting, turning, hauling and discharging.	N	No specific comments.	N

TABLE A.6.6. DEEP-WATER BOTTOM TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	4	1. SUB 2. SOU, SUB 3. SUB 4. SUB	Offal discharged during shooting and hauling on all trips, although modifications were underway to allow offal and NQBC to be held during shooting and hauling.	BB	On all trips, feeding by seabirds opportunistic, feeding on stickers, from codend and on discharged offal.	N	On all trips, feeding by NZ fur seals opportunistic, feeding on stickers, from codend and on discharged offal.	N
2	2	1. CEE, SEC, SOE 2. CEE	No processing of offal as vessel is an ice boat. Whole bycatch discarding minimal and only during steaming.	TL	Minimal seabird interactions with vessel except when codend on surface; birds took fish occasionally.	N	No specific comments.	N
3	1	1. SOE	The vessel discharged offal during shooting and hauling; however, attempts were made on some hauls to hold back offal.	TL	Noticeable increase in bird numbers when the vessel discharged offal. Cape petrel most common seabird.	N	No marine mammals sighted.	N
4	1	1. AKW	Net was down to around 300 m when offal was discharged during sets; no discharge at hauling.	Not stated	Birds present were mainly black-browed albatrosses, 60-100 waiting in area and feeding on floating fish on surface near net.	N	Common dolphin spotted on one occasion riding wake.	N
5	2	1. SEC, SOE 2. SEC, SOE	During first trip, whole fish discarded during shooting, towing and hauling.	BB	During first trip in SOE, several hundred birds following vessel; fed from codend at haul or from discarded whole fish. During the second trip, bird numbers varied depending on whether fishing was in CHA or SOE. Birds followed vessel and numbers increased at hauling, when they fed from codend.	N	No specific comments.	N
6	5	1. AKE 2. AKE 3. AKE 4. AKE, AKW 5. AKE	Vessel did not discard bycatch or offal while shooting or hauling.	TL	Generally few birds around vessel when targeting orange roughy; birds tried to feed from codend. Tori line damaged occasionally when becoming entangled in warps or the propeller.	N	No specific comments.	N
7	5	1. SOE 2. SOE, SUB 3. SEC, SOE 4. SOE 5. SOE	Large capacity meal hopper on board, enabling mealing of all non-processed whole fish and offal. Discarding occurred when all operations complete. Whole fish discards only result of mechanical breakdown. During one trip, offal not held when large amounts of heads and offal were discharged.	BB	Seabirds always present, up to 1000; when offal was occasionally discarded, numbers increased. Interactions reported on rare occasion when discarding occurred during setting. Birds fed on codend, but not overly interested. Birds feeding on offal from floor wash. On several trips discharging of offal intermittent.	N	Few or no marine mammals sighted during trips.	N

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Table A6.6—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS CAPTURE?	MARINE MAMMAL
8	3	1. AKE 2. AKE 3. AKW	All fish stowed green. Any discarding of whole fish occurred when gear out of water.	TL (rarely, vessel under 28 m)	Birds generally present in low numbers at hauling; very little to attract them to vessel. Birds would occasionally feed from codend or on fish escaping through net mesh, but not aggressively.	N N N	No specific comments.	N N N
9	4	1. AKE, AKW 2. AKE, AKW 3. AKE, AKW 4. AKE	No offal or whole fish discarded at any time. Vessel following industry code of practice.	BB (on one trip only)	Seabirds sighted in low numbers on all trips. Birds generally kept away and would turn up when winches started; followed codend in but kept distance. Occasionally fed from codend but not aggressively.	N N N N	No specific comments.	N N N N
10	3	1. CEE 2. CEE 3. CEE	No offal or whole fish discarded.	TL	Birds around vessel in low numbers at end of tow when net at surface.	N N N	No marine mammals sighted.	N N N
11	2	1. SEC, SOE 2. SOE	There was a hasher installed and used for heads, offal and bone fish discards. All birds fed. Vessel discharged during shooting and hauling, but flow was generally minimal at those times.	BB	Birds were always active about the offal discharge point. Greatest number of birds present as net surfaced.	N N	No specific comments.	N N

TABLE A6.7. INSHORE TRAWL FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	1	1. SEC	Once the catch was dumped into the pound, the net was generally shot for the next tow, before the catch was fully sorted and processed. This meant that offal and discards were not produced during shooting and hauling, but were produced for the first hour or so of the next tow.	None	Birds feeding aggressively around stern on discards and offal. Seabirds were initially attracted by the sounds of hauling and the sight of deck lights at night-time. Seabirds congregated around the codend as it surfaced and approached the stern as the net was hauled on board. The main concentration of seabirds was seen at hauling and during fish sorting and cutting, when discards were swept out both port and starboard scuppers, and offal was thrown overboard. The placement of discards of whole fish and offal was a significant factor in bird warp strikes, as shown during warp strike observations. When small discarded fish or offal landed in front of the warps, warp strikes often occurred, usually involving albatrosses and Westland petrels. One albatross was observed being dragged under by the starboard warp, but was seen to resurface.	Y	Four Hector's dolphins observed at haul of tow 3 and one seen at haul of tow 5.	N
2	1	1. CEW, CHA	Offal retained while warps in water.	None	During hauling, larger birds would actively attack and feed from codend while at surface. Smaller birds scavenged on any loose offal or fish. Birds not interested during tows unless offal discharged, at which time activity increased. Heavy warp strikes only noted when offal was being discharged. Six interactions were deck strikes at night in bad weather.	-	No specific comments.	N

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Table A6.7—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
3	1	1. SEC	Offal was usually retained on board during fishing and seabirds were not usually attracted close to the vessel during fish cutting. Offal and discards were not produced during shooting and hauling, but were produced for the first hour or two of the next tow. Discarded whole fish generally landed in the prop-wash area, away from the warps and warp entry points.	None	Birds feeding on a few small discards. Offal discarded under port warp on one tow, which resulted in a number of warp strikes. Seabirds were initially attracted by the sounds of hauling and the sight of deck lights being turned on at night-time. The main concentration of seabirds was seen at hauling and during fish sorting, when discards were swept off the trawl deck into the prop-wash. Birds were feeding aggressively around the codend, once it surfaced, and around the stern ramp during hauling and during fish sorting.	N	No specific comments.	N
4	1	1. SEC	Once the catch was dumped into the pound, the net was shot for the next tow, before the catch was processed. This meant that offal and discards were not produced during shooting and hauling, but were produced for the first hour or two of the next tow. The fish and offal from the scuppers generally passed between the two warps, in the area of the prop-wash.	WS when processing	Many warp strikes. Birds feeding on barracouta escaping from net and pulling fish through net mesh right up to stern, especially giant petrels and white-capped albatrosses. Birds feeding very aggressively at stern on discards and offal (discharged during tow). Birds were feeding aggressively around the codend, once it surfaced, and around the stern ramp during hauling, but especially during fish processing and discarding.	Y	Two Hector's dolphins sighted on return to port.	N
5	1	1. CHA	Sometimes offal was cased during processing and tipped down the stern ramp between the warps. Single tori line deployed on port side during processing; this was retracted when offal discharge ceased, even if towing. Offal not discarded during shooting or hauling.	TL	Seven sooty shearwater interactions were deck strikes.	Y	Single sighting of four Hector's dolphins, which swam in front of the starboard paravane chain briefly before disappearing.	N
6	1	1. SEC	The fish and offal from the discard chute passed under the port warp and port warp scarer device.	WS, but displaced laterally 1–2 m from warp	Birds feeding on discards and on fish escaping through net. Several birds were dragged underwater by the warp. Birds were feeding aggressively around the codend, once it surfaced, and around the stern ramp during hauling, but especially during fish processing and discarding. When the warp scarer was displaced laterally from the warp entry point, bird strikes were common.	Y	No specific comments.	N

Continued on next page

Table A6.7—continued

VESSEL NO	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
7	1	1. CHA	Whole fish discards were discarded at the end of processing and while towing. When targeting flat fish (e.g. flounder species), offal was retained during setting, towing and hauling. When targeting tarakihi, offal was binned and discarded after processing and during tow.	None	White-capped albatross caught on warp, went through block and dropped overboard. Intermittent offal and discards were being discharged for that tow.	Y	Three separate sightings of Hector's dolphins around vessel on same day. Common dolphins and NZ fur seals sighted on occasion.	N
8	1	1. SEC	Offal and discards were not produced during shooting and hauling, but were produced for the first hour or two of the next tow.	None	Some small stickers fall through the mesh at hauling, birds aggressively feeding. Birds also feeding aggressively on discards and offal. Albatrosses eating whole, small spiny dogfish. Seabirds were initially attracted by the sounds of hauling and the sight of deck lights at night time. Seabirds congregated around the codend as it surfaced and approached the starboard-side of the vessel as the net was hauled on board. The main concentration of seabirds was seen at hauling and during fish sorting and cutting, when discards were swept out the starboard scuppers and offal was thrown overboard. Warp strike observations were concentrated during times when fish processing was occurring and a new tow was in progress. Sooty shearwaters were observed diving under the net and under the vessel at hauling and during fish processing.	Y	No specific comments.	N
9	2	1. AKW 2. AKW	A small amount of offal and heads from school shark and rig was discharged, and undersized snapper were discarded along with some non-quota species. This occurred during the shoot and beginning of haul.	TL	White-capped albatrosses, flesh-footed shearwaters (mainly), giant petrels and wandering albatrosses (occasionally) were observed feeding aggressively at the codend. Tori lines deployed over each warp for every tow. No birds were observed to come into any contact with the warps in the snapper fishery. Bird numbers low when targeting orange roughly, higher when targeting snapper and feeding on washed out fish.	N N	No specific comments.	N N

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Table A6.7—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
10	1	1, AKW	Whole fish discards were discharged while setting, often coinciding with net shooting. All target species caught were landed green except flatfish and sharks. Offal low quantity, batch discharged following sorting, generally coinciding with trawling.	None	Seabirds rarely came within 2 m of the warps. Observer considered there to be minimal threat to birds from warp strikes. Seabird estimates within 50 m ranged from 0 to 23, and beyond 50 m from 0 to 136. Larger birds more attracted to fishing vessel. Black-backed gulls and white-capped albatrosses most prevalent seabirds seen to interact with the fishing vessel. No birds attempted to feed directly from the net. Fish lost through the net during hauling were scavenged. Large birds went for whole fish (including discards) while smaller birds went for offal.	N	Common dolphins seen twice, no interest in net.	N

TABLE A.6.8. INSHORE BOTTOM LONGLINE FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	1	1. AKE, AKW	No specific comments.	LW	Seabirds observed at hauls and seen targeting offal and bait. Up to 75 birds present at haul. Setting undertaken at night.	N	Orca suspected of removing fish from line; vessel stopped fishing and returned to port. Orca not sighted.	N
2	1	1. SEC	No fish processing occurred during setting.	LW	Seabirds primarily attracted to offal discarding between sets. Birds sometimes pecked at bait on the surface.	N	No specific comments.	N
3	1	1. AKE	No specific comments.	LW	Seabirds not present in large numbers during night-time sets. During first daylight, haul numbers increased gradually. Smaller albatrosses attracted by lost bait. During daylight sets, bird activity increased. Most birds flew around the end of the aerial section of the tori line.	N	On one occasion, orca were present when fishing for bluenose and skipper steamed away from the grounds overnight and changed to hapuku/bass, which are not taken by orca.	N
4	2	1. CEE, SOE 2. SOE	During the first trip, only 65% of bait was hooked and remaining bait was dropped overboard. On hauling, spent bait was falling off stern and floating over line. Offal retained. Some heads going overboard. During the second trip, the vessel was operating under a code of practice (developed post bycatch event on first trip).	LW	Seabirds always present, fed aggressively on discards that were discarded at end of each set. Birds showed interest in line during hauling and also picked up lost bait at set. Poor line weighing regime and ineffective tori line during first trip. High seabird captures on first trip.	Y	During first trip, NZ fur seals followed vessel, taking fish from the line.	N
5	1	1. AKE	Bait and offal retained during hauling and no offal discarded during shooting.	TL, LW	Seabirds constantly present and feeding on any offal / used bait discarded by the vessel as well as any lost fish during hauling. Numbers increased during hauling. Sets generally at night.	N	On three occasions, 3-6 orca around vessel actively feeding from mainline. Vessel steamed away from the area to avoid further losses.	N
6	1	1. SEC, SOE	Offal discarded during hauling and bait scraps washed over the side during setting.	TL, NS, LW	Birds followed vessel and fed from bait scraps washed over the side during setting or from discarded offal during hauling. The tori line broke on two occasions and birds came in closer to vessel and began diving on bait during setting. Birds fed aggressively on offal during hauling.	Y	No marine mammals sighted.	N

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Table A6.8—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
7	1	1. AKE	No offal discarded during setting or hauling. Hauls 9 and 12, crew member fed birds shark liver during haul. Haul 14, crew instructed not to feed birds during haul and bait carefully kept, not washing out scuppers.	TL, NS, LW	Birds feeding on lost bait during setting. Seabirds interested in line hauling, feeding on occasional lost bait. Some petrels were diving onto line during hauling.	Y	As general practice to avoid orca, the boat quickly hauled, then steamed away overnight, then changed target species to hapuku/bass. Six orca seen during haul 16, with bluenose taken from line; vessel steamed elsewhere.	N
8	1	1. CEE	Practices employed included bait retention and not dumping offal during setting or hauling.	LW	Seabirds constantly observed following vessel and feeding on any offal or bait discharged, as well as any fish lost from the line during hauling. Numbers increased considerably during hauling and setting. Night setting.	Y	Several NZ fur seals seen around vessel but no direct interactions. About 10 common dolphins also seen around vessel during a haul, but no direct interaction.	N
9	1	1. CEE, SEC	Any fish discarded during hauling thrown over port side.	TL, LW, DH	Seabirds present at all times during the day, less than 200. Birds feeding on lost bait and fish during hauls, and on offal and discards at other times.	N	Common dolphins commonly seen when fishing in SEC near Kaikoura; pods of up to 60 around vessel during hauling, but no interest in fish being hauled. NZ fur seals seen in SEC and CEE on several occasions and showed considerable interest in fish. During hauling of set 21, 5–6 orca were seen feeding aggressively near the vessel.	N
10	1	1. SOE	During haul, larger birds fed on lost fish and used bait washed out of the scuppers.	TL, LW	Tori line tangled on four occasions as caught on hooks during set; on two of these occasions, birds caught. Surprisingly few birds seen for the Chatham Island area. During 29 hauls, 2113 birds observed within 150 m of vessel during hauling.	Y	No marine mammals seen.	N
11	1	1. AKE	Bait and non-ITQ discarded during hauling.	LW	During setting, no more than 3 grey-faced petrels would fly above line. No diving on line. During hauling, the discarding of bait and non-ITQ species would attract up to 30 wandering albatrosses, which fed on discards.	N	No specific comments.	N
12	1	1. SOE	During hauling, all offal and non-ITQ species were retained and dumped at the end of hauling. No offal was discharged during setting.	TL, LW	The bait line was always within the tori line area and birds stayed out of this area. Sets made during day and night.	Y	No specific comments.	N

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Table A6.8—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
13	1	1. SEC, SOE	No offal or discards discharged during setting.	TL, LW	Seabirds following vessel while hauling, feeding on offal and lost fish.	Y	A pod of 60 plus common dolphins passed the vessel on one occasion and a pod of over 22 pilot whales also crossed paths with the vessel; neither interacted. NZ fur seals were observed alongside the vessel on 14 occasions, seen eating conger eels (<i>Conger</i> sp.) discarded by vessel.	N
14	1	1. SOE	Used bait and offal retained during setting and hauling.	TL, LW	Seabirds constantly following vessel and feeding on any offal or used bait discarded by the vessel, as well as lost fish. Numbers increased during hauling and setting.	Y	No marine mammals sighted.	N

TABLE A.6.9. SETNET FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1	1	1. SEC	Processing undertaken during steam back to port.	PI	Between 15 and 250 seabirds constantly present, but no feeding from net observed. Aggressive feeding only occurred during the steam to port while the vessel was processing fish and discarding offal.	N	Hector's dolphins observed on 2 of 3 day trips. During set 1, Hector's dolphins were abundant, with around 10 present during hauling, diving over and under the net, and swimming up and down the net and around the vessel. Around 20 were bow riding on steam to port.	N
2	1	1. SEC	Processing undertaken during steam back to port.	PI	Between 5 and 120 seabirds constantly present around the vessel and on three occasions observed to be around net during the haul. No actual feeding on fish observed. Aggressive feeding only occurred during processing when steaming back to port.	N	Hector's dolphins observed on all trips, 1-4 on each occasion. Generally swimming around vessel, bow riding, jumping. On a single occasion, 4 Hector's dolphins were observed around vessel during haul and on another occasion 1 Hector's dolphin was around vessel during setting.	N
3	1	1. SEC	No specific comments.	None	Birds could usually be seen following the vessel at all times and numbers varied from less than 5 to around 50. The greatest number congregated as fish were being processed, feeding on discarded offal. During sets and hauls, birds would follow vessel, but seldom came within 5 m of net.	N	The only marine mammals seen during the trip was a pod of 15-20 common dolphins, which passed under the vessel stern, then turned to follow the vessel as it steamed away.	N
4	1	1. SEC	Only fish cutting during hauling occurred when large skate were caught occasionally; most occurred whilst steaming between hauls. No processing during setting. Nets cleared of all fish pieces prior to setting.	None	Seabirds primarily attracted to offal discarding between sets. Seabirds accumulated from first haul of day sat on water during hauling. Fed aggressively when discards and offal thrown overboard. Birds were not seen feeding from nets.	N	Dusky dolphins and NZ fur seals seen, not feeding. No Hector's dolphins seen. Avoided fishing in shallow water, near beaches or near river mouths.	N
5	1	1. SOU	Damaged whole fish were regularly discarded during hauling. No feeding from or interaction with net observed.	None	Birds did not appear to be interested in the net or the vessel unless offal was being discarded during setting or hauling, when bird numbers dramatically increased.	N	3 Hector's dolphins seen when steaming to anchorage; no interest in vessel.	N
6	2	1. CEW, CHA	No specific comments.	None	Few species of seabirds were observed. These included white-chinned petrel and white-capped albatross (1-6). During setting and hauling, seabirds were seen to swim or fly by with no interest. During the second trip, the species of seabirds observed were minimal, with seagulls observed once. Seabirds flew around or near the vessel, but not feeding.	N	Seven common dolphins observed on one occasion swimming at the sides of the vessel and in front whilst the net was being hauled. Appeared to have no interest in fishing activity and were away from the net at all times. No marine mammals observed during second trip on this vessel.	N

Continued on next page

Table A6.9—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
7	1	I. SEC	Fish were cut intermittently during hauling; no fish processing during setting. Net cleaned during hauling.	Set > 60 m depth	Seabirds attracted during processing and fed aggressively on offal, especially livers. Feeding occurred on both sides of the vessel, clear of the net. Birds gathered around the vessel at first haul of day, and followed vessel until the last net was re-set. A sooty shearwater was seen diving down several metres and swimming under vessel.	Y	Vessel avoided setting nets at depths less than 60 m as the skipper believed Hector's dolphins can only dive to 50 m; also avoided known Hector's dolphins areas near river mouths, along the coast and around Kaikoura peninsula. Small pods of DDO occasionally passed by; no interactions.	Y
8	1	I. SEC	Offal discharged during hauling thrown away from the net and vessel. Offal not discharged during setting.	None	Seabirds present were observed feeding intermittently on offal discharged from the vessel. When nets re-set, birds followed vessel in lesser numbers.	N	Only two observations of marine mammals. On one occasion, up to 6 dusky dolphins in vicinity of vessel and on another occasion 1 NZ fur seal seen near vessel. The vessel will delay re-setting of nets if marine mammals in vicinity.	N
9	1	I. SOU	No specific comments.	None	The main seabirds were black-backed gulls, cape petrels, white-capped albatrosses, red-billed gulls and white-chinned petrels. Apart from gulls, no species were interested in the net and were only observed following the boat during sets and hauls.	N	No marine mammals observed during setting or hauling.	N
10	1	I. SEC	Processing undertaken during steam back to port.	PI	Between 3 and 100 birds constantly around vessel. Birds competed for discarded fish during hauling, some aggressive feeding. Most activity during steam home when processing and discarding offal.	N	Hector's dolphins observed each day, 2-4 on each occasion. Generally swimming around vessel, bow riding, jumping.	N
11	1	I. SOU	The vessel very rarely discarded offal during setting or hauling, only when fishing was slow so a crew member had time to process fish during haul. Whole, severely damaged fish regularly discarded during hauling.	None	Birds not interested in vessel unless offal being discarded, during which time bird numbers increased dramatically. No feeding or interacting with net.	N	Marine mammals observed on two occasions when small groups of Hector's dolphins approached vessel on anchorage.	N
12	1	I. SOU	Processing undertaken during steam back to port.	None	Apart from gulls, seabirds showed little interest in the net while it was being set or hauled. Once the vessel moved off and started processing fish, birds showed much more interest.	Y	No specific comments.	N
13	1	I. SEC	Processing undertaken during steam back to port.	PI	Seabirds constantly present. Showed little interest in fishing activity with aggressive feeding only occurring during processing and offal discarding when steaming back to port.	N	Hector's dolphins observed on all trips. Between 2 and 10 present and were swimming around vessel, jumping in distance and bow riding.	N

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Table A6.9—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
14	1	1. SOU	No offal was produced during setting or hauling; all processing was done after the last net was hauled as the vessel was on its way back to port.	None	Apart from gulls, no other seabirds showed any interest in the net during setting or hauling. White-capped albatrosses, cape petrels and white-chinned petrels present.	N	No marine mammals seen.	N
15	1	1. CEW	No offal discharged while vessel actively fishing.	None	Low seabird numbers; generally observed sitting on water or flying past with no interest.	N	No marine mammals observed.	N
16	1	1. SEC	Processing undertaken during steam back to port.	PI	Between 30 and 125 seabirds were constantly present, generally showing little interest except on two occasions when c. 25 black-backed gulls were at stern of vessel around net. No actual feeding observed. Aggressive feeding only occurred during steam home while vessel processing fish and discarding offal.	N	Hector's dolphins observed on all four trips, with between 2 and 10 animals observed on any one occasion—swimming around vessel, jumping, bow riding. On one occasion, 2 Hector's dolphins seen swimming around stern of vessel at haul.	Y
17	1	1. SEC	No fish gutting performed until hauling completed and none during setting.	None	Seabirds attracted to vessel primarily due to offal discarding between sets. Aggressive feeding by seabirds when offal discarded between sets. Nets always cleaned during hauling and no birds observed feeding from net.	N	Dusky dolphins and NZ fur seals sighted, but not interacting with net. No Hector's dolphins sighted. Avoided fishing in shallow water, near beaches or near river mouths.	N
18	1	1. CEW, AKW	Offal discharged during 41% of hauls.	None	Seabirds not always in attendance to the vessel and never in great numbers. Proximity to land dictated species present. Dominated by black-backed gulls when close to land and flesh-footed shearwaters when over 12 n.m. from land. All birds typically displayed little or no interest in the setting operations. During hauling, seabird numbers would swell, regardless of whether there was offal discharge (which occurred 41% of the time during hauling); a noticeable increase in numbers was evident when offal discharge did occur.	N	Common dolphins were sighted twice, both with pods coming to the vessel and bow riding. One pod of 8 long-finned pilot whales came to the vessel during hauling of set 18 and stayed close to the line, bobbing and showing interest in the vessel. The pod stayed c. 30 minutes and then swam off.	Y
19	1	1. CEW	No offal discharged while vessel actively fishing.	None	Seabirds most often sitting on water or flying past showing no interest in net.	N	No marine mammals sighted.	N
20	1	1. SEC	Processing undertaken during steam back to port.	None	Between 50 and 150 birds constantly present around the vessel. The birds showed no interest in the fishing activity itself but seemed content to wait until fish processing and subsequent discarding of offal was undertaken on the steam to port, when feeding was aggressive.	N	Hector's dolphins observed on both day trips during steam back to port.	N

TABLE A6.10. CHARTER TUNA SURFACE LONGLINE FISHERY.

VESSEL NO.	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1 Trip 1	CEE, CHA	Offal discharged during hauling.	TL, pendulum, water hose, weighted snood, bait thawed	Seabirds commonly seen following vessel. A total of 40 birds captured on this trip (some captures during the 2006/07 observer year). Many bird captures can be attributed to the tort line snapping in rough weather.	Y	NZ fur seals, pilot whales, common dolphins and bottlenose dolphins each seen at least once.	Y
1 Trip 2	SOU, CHA	From set 22 onwards, returned bait was held and discharged out the port side. Bait thrower used.	NS, TL, pendulum, weighted hooks and swivels, deck hose, streamer poles	Birds, mainly black-browed albatrosses and white-chinned petrels, followed baited hooks and attempted to feed on bait. During set 6, noticeably fewer birds were around the hauling area as crew retaining used bait.	Y	NZ fur seals present around vessel occasionally, in groups of up to 5. A pod of c. 50 common dolphins observed on one occasion feeding around vessel. Of 5 live seals, 2 swallowed hooks, 3 hooked in flipper or skin.	Y
2 Trip 1	CEE	Unused bait was retained in a basket and discarded through the discard shoot on the opposite side of the hauling station.	TL, pendulum, weighted swivels	Seabird numbers ranged from 30 to 120, average 63. All species except albatrosses observed to feed opportunistically on offal discards and deck wash.	Y	No NZ fur seals observed, but one hooked at night; snood cut off while animal still in water. In CEE on four occasions, dolphins and pilot whales observed during hauling, up to 200 individuals.	Y
2 Trip 2	SOU, CHA	Offal discarded opposite side of hauling station. Crew followed code of practice and did not discard bait, which was discarded at end of hauling.	TL, pendulum, weighted swivels, additional mitigation following captures	12 birds caught in first 10 sets. Changed mitigation practices. Only 1 bird caught following these adjustments. Bird numbers during hauling ranged from 40 to 170. Birds often fed on discarded offal from opposite side of hauling and sometimes chased baited snoods back to vessel. During hauling, two poles with streamers attached were deployed over hauling side of vessel; these proved successful.	Y	NZ fur seals observed around vessel during haul on eight occasions, with numbers ranging from 1 to 20. Mainly groups of pups and not close to line. On one occasion, 2 orca were observed close to the line and on two occasions common dolphins were seen.	N

TABLE A6.1.1. DOMESTIC TUNA AND SWORDFISH SURFACE LONGLINE FISHERY.

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?	TURTLE CAPTURE?
1	1	1. AKE	Offal discharged, bait not retained.	NS, TL	Seabird numbers low. Petrels were observed taking discarded squid bait, with cape petrels and albatrosses occasionally seen.	N	No marine mammals sighted.	N	N
2	3	1. CEE 2. CEE, KER 3. CEE	Birds fed on discarded bait and occasionally on discarded offal.	NS, TL, weighted swivels	During first trip (CEE), birds present in low numbers, but numbers increased substantially during hauling. Two captures occurred during extended pause in haul. No captures during second trip (CEE, KER); bird numbers increased during the day in KER. During third trip, bird numbers low, with maximum of 40 at hauling.	Y N Y	During third trip (CEE), orca damage on one set.	N N N	N Y N
3	1	1. CEE	The vessel discarded offal and used bait (squid) while hauling, and birds were frequently observed feeding on this.	None first 5 sets then TL	During the day, the number and variety of seabird species would increase. Sets 1-5 used no mitigation, then a tori line was used.	Y	No specific comments.	Y	N
4	1	1. AKW	Offal discharge only occurred when fish was being processed and the vessel was usually stationary.	TL	Overall, very few birds seen and those present showed no interest in the line during setting or hauling. Birds only approached vessel during intermittent period of offal discharge. At these times, birds came into close proximity of vessel to feed but retreated when hauling resumed.	N	No marine mammals sighted.	N	N
5	1	1. AKE, CEE, KER	Bait discarded.	TL	Seabirds accompanied the vessel at all times. Black-browed albatross most abundant, about 20 per day. Birds attempted to feed on discarded bait.	N	Four orca present, eating fish on line. Six pilot whales seen on another occasion; the vessel did not shoot away near the pod and steamed for several hours before shooting.	N	N
6	2	1. AKE, AKW 2. AKW	When hauling in daylight hours, used bait (squid) was retained on board and discarded once dark. Only discharged offal from fish processing during hauling.	TL, NS, DB, weighted swivels	Vessel follows code of practice, uses tori lines during setting and retains used bait on board during hauling. During setting, seabirds attempted to remove bait from hooks; this was achieved by black petrels diving below surface and bringing bait to surface where larger birds would snatch it. During hauling, birds snatched remaining bait; no seabirds hooked during hauling.	Y Y	No specific comments.	N N	N N

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Table A6.11—continued

VESSEL NO.	NO. TIMES OBSERVED	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?	TURTLE CAPTURE?
7	1	1. CEE, AKE	All unused bait held on board.	TL	Seabirds often followed vessel, especially at the beginning of hauling, but as all bait held on board, numbers decreased.	N	Pilot whales sighted close to vessel on two occasions.	N	N
8	2	1. AKE, AKW 2. CEE	Unused bait and offal discarded.	NS, TL	Seabirds present throughout the trip, with up to 75 present during hauling; feeding on discarded bait and offal astern of vessel. During second trip, observer noted birds followed vessel during hauling due to constant stream of uneaten bait being discarded.	N N	No marine mammal sightings.	N N	N N
9	1	1. AKE	Offal dumped during haul.	DB, NS	Snoods and bait sink below the surface quickly approximately 16 to 20 m behind the vessel. 20% of snoods fitted with lead swivels. Also fitted with Kortz nozzle and the thrust from propeller causes turbulence, preventing birds from accessing bait.	Y	No specific comments.	N	N
10	1	1. CEE	No bait retention or dying of bait. No weighted swivels used. Squid bait pliable to limp.	NS, TL (tangling issues with TL)	Seabirds in constant presence during hauling, competing for returning squid bait as discarded throughout haul.	Y	No marine mammals sighted.	N	N
11	1	1. AKE, CEE	No specific comments.	NS, TL	Trip covers 2006/07 and 2007/08 observer years. Captures in 2006/07 year.	N	No marine mammals sighted.	N	N
12	1	1. CEE	Unused bait discarded.	NS, TL	Small numbers of birds observed during setting. Birds present in reasonably large numbers during hauls. Flesh-footed shearwaters fed aggressively on discarded sanma bait. Squid bait was ignored.	Y	No marine mammals sighted.	N	N
13	1	1. AKE, CEE	Offal and bait discarded. Bait was retained in some instances.	NS, TL	Seabirds constantly present around vessel, feeding on any offal or bait discharged; numbers increased during hauling.	Y	No marine mammals sighted.	N	N
14	2	1. AKE, CEE 2. CEE	Vessel kept all bait on board whilst hauling.	TL, NS	During first trip, usually 20 grey petrels and 10 cape petrels sighted while hauling. Albatrosses also sighted. During second trip, bird assemblage similar, with black-browed albatrosses most abundant.	Y N	During first trip, one NZ fur seal caught and one pod of pilot whales sighted. During second trip, no marine mammals observed apart from two NZ fur seals caught alive.	Y Y	N N

TABLE A6.1.2. DEEP-SEA LING BOTTOM LONGLINE FISHERY.

VESSEL NO.	FMAS FISHED	OFFAL MANAGEMENT	MITIGATION USED	SEABIRD INTERACTIONS	SEABIRD CAPTURE?	MARINE MAMMAL INTERACTIONS	MARINE MAMMAL CAPTURE?
1 Trip 1	CEE, SEC, CHA	Offal never discharged during setting. Some species gutted or winged and offal immediately discarded along with anything that could not be mealied. This resulted in increased bird numbers and aggression. Vessel attempted to dump offal as far as possible from the line.	TL, IWL, AC	Seabirds abundant during hauling and setting. Cape petrels always present. Birds appeared to show little interest in the line itself during hauling and instead scavenged on fish lost from the line.	N	NZ fur seals commonly seen during hauling, particularly while fishing in the Wellington area. Damage from NZ fur seals did not seem significant compared with lice damage. Four dusky dolphins swam within 10 m of vessel.	N
1 Trip 2	SUB	No offal was discarded during setting or hauling. Whole fish retained on board to be discarded on completion of hauling.	TL, IWL, AC, DH	Seabirds following vessel at all times. Salvin's albatrosses prominent during first half of trip. An erect-crested penguin was continuously near the vessel on 5-6 April. Birds fed on factory wash, lost fish during hauling and lost bait during setting.	Y	NZ fur seals near vessel on a number of occasions, feeding on fish pulled from the line and lost fish. A single orca observed at stern on one occasion.	N
2 Trip1	SOU	Vessel batch dumped offal and any discarded species.	TL, IWL, AC	Seabirds present in moderate numbers. Number and activity highest during setting, with white-chinned petrels and sooty shearwaters being most active, by diving and feeding on lost bait. Activity greatest 60-80 m behind vessel during setting. During hauling, birds followed the vessel, feeding on lost fish or offal discharged through the sumps.	Y	NZ fur seals seen on rare occasions and in low numbers.	N

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