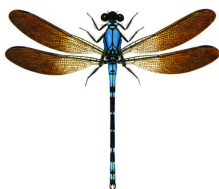


Protected species bycatch in orange roughy trawl fisheries, 2002–03 to 2011–12

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Research Report prepared for Ministry for Primary Industries



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EXECUTIVE SUMMARY

In New Zealand waters, incidental captures of protected species, including marine mammals and seabirds, are recorded by government fisheries observers on-board commercial fishing vessels. These observer data provide independently collected information that is used in bycatch assessments to estimate the total number of protected species captured in New Zealand's Exclusive Economic Zone (EEZ). This report presents estimates of the total number of seabirds and marine mammals that were incidentally captured in New Zealand trawl fisheries targeting orange roughy (*Hoplostethus atlanticus*) in the period between 2002–03 and 2011–12.

In the 10-year reporting period, there were 37 403 tows conducted in trawl fisheries targeting orange roughy in New Zealand's EEZ. Most fishing effort was on East and South Chatham Rise, where a total of 18 085 tows were fished. Corresponding observer coverage in all orange roughy fisheries ranged from 16% in 2003–04 to 44% in 2007–08. In the most recent fishing year, 2011–12, observer effort was 28% of all tows.

Between 2002–03 and 2011–12, there was a total of 48 seabird captures documented by observers, compared with six observed fur seal captures. Most of the observed seabird captures (37 captures) occurred on the East and South Chatham Rise, with the remainder reported on Northwest Chatham Rise (9 captures), on the east coast, and in other areas (1 capture each). All observed fur seal captures were reported in orange roughy trawl fisheries operating in other areas.

Orange roughy trawl fisheries were generally well observed, and there were few observed seabird and fur seal captures. For this reason, the estimates were mostly very low. Around the Chatham Islands, the estimate was highest for the grouping large birds, with a peak in 2009–10, when a mean estimate of 14 (95% c.i.: 13 to 18) large birds were caught. This estimate is made up of Salvin's, Buller's, white-capped and other large albatrosses. Observed captures in the area included Salvin's, southern Buller's, and Chatham albatrosses, and other unidentified albatross species.

1. METHODS

1.1 Data sources

This reports presents estimates of incidental captures of sea birds and marine mammals in commercial orange-roughy trawl fisheries within the outer boundary of New Zealand's Exclusive Economic Zone (EEZ). Very few marine mammals have been observed caught in the orange-roughy fishery, and in the ten year period since October 2002, only six New Zealand fur seals have been observed. The only other mammal captures recorded were two sea lions caught in December 1997 and December 1998 near the Auckland Islands. Both were released alive.

Estimates were derived for seabird and fur seal captures using statistical models based on fishing effort and observer data. Fishing data were obtained from records of trawler activity reported by commercial fishers on Trawl Catch Effort Processing Return (TCEPR), Trawl Catch Effort Return (TCER), or Catch Effort Landing Return (CELR) forms. Information recorded on these forms includes the date and time of trawl effort, the position of the start and end of each tow, the target species, catch weight, and details of the fishing gear used. These data were assumed to include a complete record of the trawl effort, and were used as the authoritative source for tow time and location information required for modelling.

Incidental captures of protected species are recorded by New Zealand's Ministry for Primary Industries and Department of Conservation observers on-board commercial fishing vessels. Observer data include the identity of the species captured, and the time and location of the captures and of every observed tow. These data are entered into a database administered by National Institute of Water and Atmospheric Research (NIWA) on behalf of Ministry for Primary Industries.

Both fishing effort and observer records were groomed and linked, correcting for errors in date, time, and position fields. The observer data were groomed by NIWA, and did not require further grooming. The preparation of fisher-reported data was updated from that used previously (Thompson & Abraham 2010, 2011, Thompson et al. 2010, 2011, 2013, Abraham & Thompson 2011), with the most important change concerning the handling of missing values. On some forms, the fisher had entered some data for the first row, only entering data on subsequent rows when the data changed. In these cases, the missing fields were imputed by considering the data in the first row.

Observer records were linked to the fisher-reported effort data by comparing the start and end times, location, and target species for each vessel. As the observer data are only used to link captures to the fisher-reported effort, only the capture information was used from these electronic records.

Trawl fishing events were assigned to fisheries on a tow-by-tow basis using the target species code reported by the fisher (following Abraham & Thompson 2011). The trawl tows selected for this assessment were limited to those reported by the fisher as targeting orange roughy.

The capture data presented here are reported for each of five groups of orange roughy quote management areas (QMAs), including:

ORH3B east and south rise	QMA ORH3B – East and South Chatham Rise
ORH3B north west rise	QMA ORH3B – Northwest Chatham Rise
ORH mid east coast	Three QMAs: ORH 2A South, ORH2B and ORH3A
ORH7A challenger	QMA ORH7A – the Challenger Rise
Other areas	All other areas

Table 1: Orange-roughy trawl effort in tows for each of the five reported QMAs, and all areas by fishing year.

	QMA group					
	ORH3B E&S	ORH3B NW	ORH east coast	ORH7A challenger	Other areas	All areas
2002–03	2301	880	2	424	1289	4896
2003–04	2439	790		421	1216	4866
2004–05	2273	575	61	710	1383	5002
2005–06	2488	609	63	599	1188	4947
2006–07	2414	158		460	1026	4058
2007–08	1999	283		525	882	3689
2008–09	1952	183	65	581	763	3544
2009–10	1272	282	78	620	670	2922
2010–11	481	11	113	658	626	1889
2011–12	466	9	105	468	542	1590

Table 2: Observed seabird captures in orange-roughy trawl effort in tows for each of the five reported QMAs and all areas, by fishing year.

	QMA group					
	ORH3B E&S	ORH3B NW	ORH east coast	ORH7A challenger	Other areas	All areas
2002–03						0
2003–04	3					3
2004–05	9	9			1	19
2005–06	2					2
2006–07	1					1
2007–08	2					2
2008–09	6					6
2009–10	13					13
2010–11	1		1			2
2011–12						0

Table 3: Observed New Zealand fur seal captures in orange-roughy trawl effort in tows for each of the five reported QMAs and all areas, by fishing year.

	QMA group					
	ORH3B E&S	ORH3B NW	ORH east coast	ORH7A challenger	Other areas	All areas
2002–03						0
2003–04					1	1
2004–05					3	3
2005–06					1	1
2006–07					1	1
2007–08						0
2008–09						0
2009–10						0
2010–11						0
2011–12						0

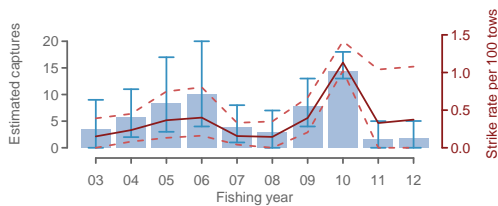
2. RESULTS

2.1 Large bird captures, ORH3B east and south rise

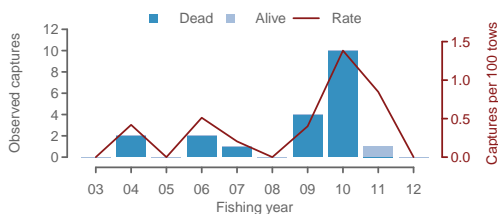
Table 4: Annual trawl effort, observer coverage, observed numbers of large bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	3	0 - 9	0.2	0.0 - 0.4
2003–04	2439	20	2	0.4	6	2 - 11	0.2	0.1 - 0.5
2004–05	2273	30	0	-	8	3 - 17	0.4	0.1 - 0.7
2005–06	2488	16	2	0.5	10	4 - 20	0.4	0.2 - 0.8
2006–07	2414	20	1	0.2	4	1 - 8	0.2	0.0 - 0.3
2007–08	1999	47	0	-	3	0 - 7	0.1	0.0 - 0.4
2008–09	1952	51	4	0.4	8	4 - 13	0.4	0.2 - 0.7
2009–10	1272	57	10	1.4	14	13 - 18	1.1	1.0 - 1.4
2010–11	481	25	1	0.8	2	0 - 5	0.3	0.0 - 1.0
2011–12	466	26	0	-	2	0 - 5	0.4	0.0 - 1.1

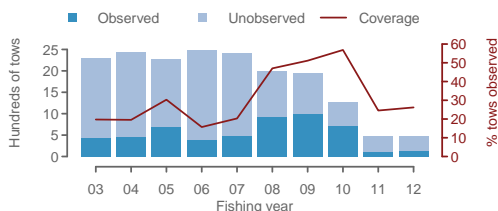
(a) Estimated captures



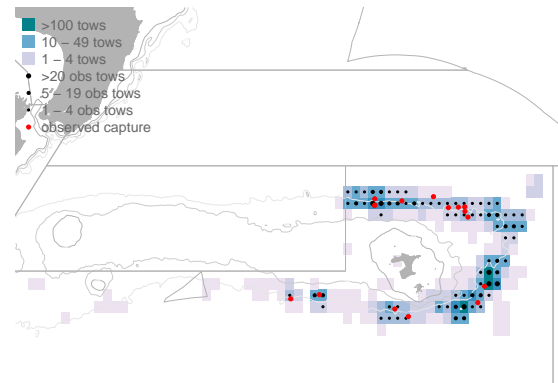
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

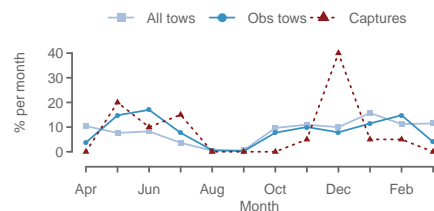


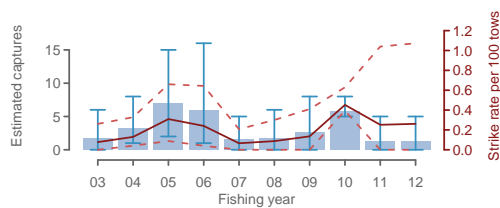
Figure 1: Annual time series of (a) estimated small bird captures, (b) observed large bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.2 Salvin's albatross captures, ORH3B east and south rise

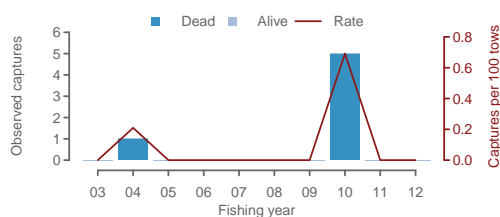
Table 5: Annual trawl effort, observer coverage, observed numbers of Salvin's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	2301	20	0	-	2	0 - 6	0.1	0.0 - 0.3
2003-04	2439	20	1	0.2	3	1 - 8	0.1	0.0 - 0.3
2004-05	2273	30	0	-	7	2 - 15	0.3	0.1 - 0.7
2005-06	2488	16	0	-	6	1 - 16	0.2	0.0 - 0.6
2006-07	2414	20	0	-	2	0 - 5	0.1	0.0 - 0.2
2007-08	1999	47	0	-	2	0 - 6	0.1	0.0 - 0.3
2008-09	1952	51	0	-	3	0 - 8	0.1	0.0 - 0.4
2009-10	1272	57	5	0.7	6	5 - 8	0.5	0.4 - 0.6
2010-11	481	25	0	-	1	0 - 5	0.3	0.0 - 1.0
2011-12	466	26	0	-	1	0 - 5	0.3	0.0 - 1.1

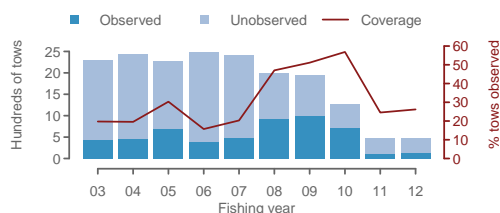
(a) Estimated captures



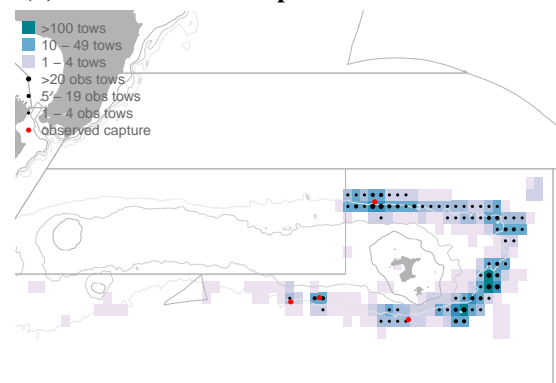
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

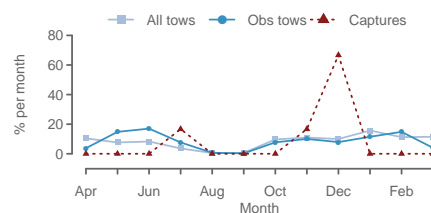


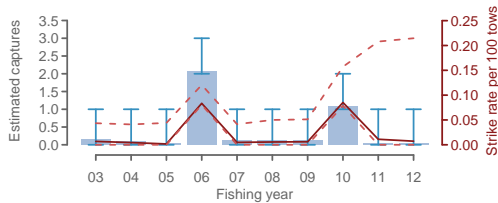
Figure 2: Annual time series of (a) estimated small bird captures, (b) observed Salvin's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.3 Buller's albatross captures, ORH3B east and south rise

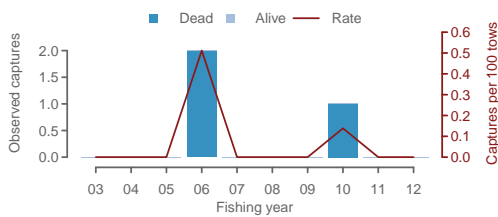
Table 6: Annual trawl effort, observer coverage, observed numbers of Buller's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	2301	20	0	-	0	0 - 1	0.0	0.0 - 0.0
2003-04	2439	20	0	-	0	0 - 1	0.0	0.0 - 0.0
2004-05	2273	30	0	-	0	0 - 1	0.0	0.0 - 0.0
2005-06	2488	16	2	0.5	2	2 - 3	0.1	0.1 - 0.1
2006-07	2414	20	0	-	0	0 - 1	0.0	0.0 - 0.0
2007-08	1999	47	0	-	0	0 - 1	0.0	0.0 - 0.1
2008-09	1952	51	0	-	0	0 - 1	0.0	0.0 - 0.1
2009-10	1272	57	1	0.1	1	1 - 2	0.1	0.1 - 0.2
2010-11	481	25	0	-	0	0 - 1	0.0	0.0 - 0.2
2011-12	466	26	0	-	0	0 - 1	0.0	0.0 - 0.2

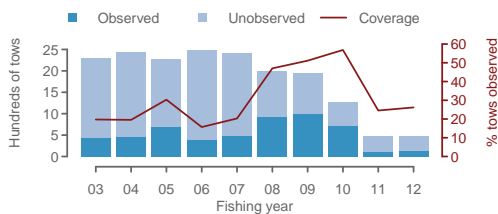
(a) Estimated captures



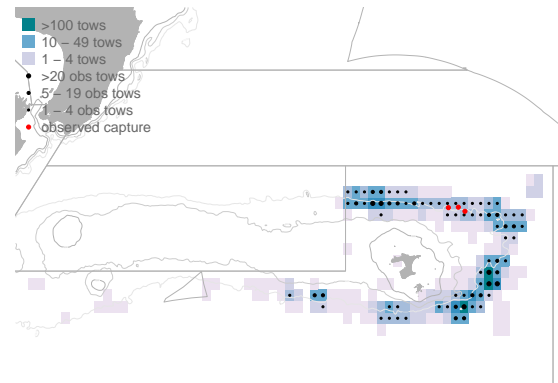
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

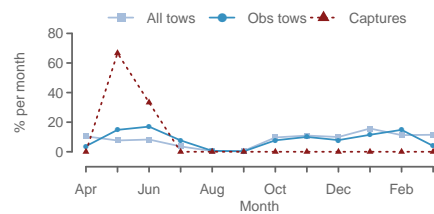


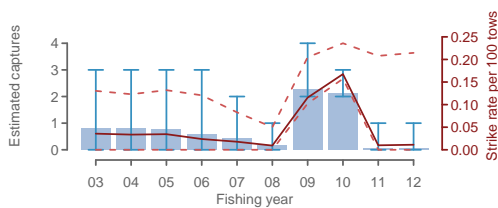
Figure 3: Annual time series of (a) estimated small bird captures, (b) observed Buller's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.4 White-capped albatross captures, ORH3B east and south rise

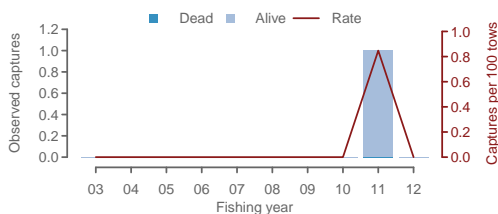
Table 7: Annual trawl effort, observer coverage, observed numbers of white-capped albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	1	0 - 3	0.0	0.0 - 0.1
2003–04	2439	20	0	-	1	0 - 3	0.0	0.0 - 0.1
2004–05	2273	30	0	-	1	0 - 3	0.0	0.0 - 0.1
2005–06	2488	16	0	-	1	0 - 3	0.0	0.0 - 0.1
2006–07	2414	20	0	-	0	0 - 2	0.0	0.0 - 0.1
2007–08	1999	47	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	1952	51	0	-	2	2 - 4	0.1	0.1 - 0.2
2009–10	1272	57	0	-	2	2 - 3	0.2	0.2 - 0.2
2010–11	481	25	1	0.8	0	0 - 1	0.0	0.0 - 0.2
2011–12	466	26	0	-	0	0 - 1	0.0	0.0 - 0.2

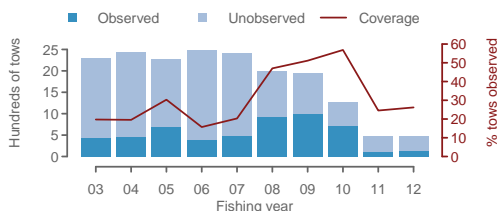
(a) Estimated captures



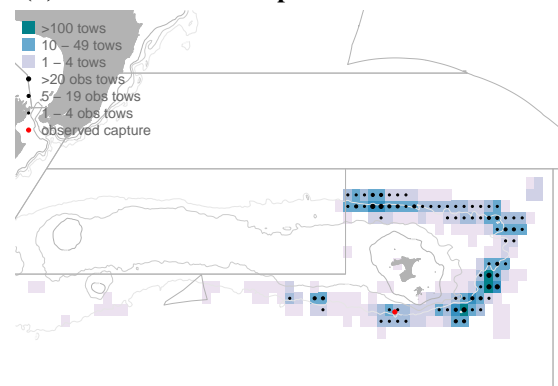
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

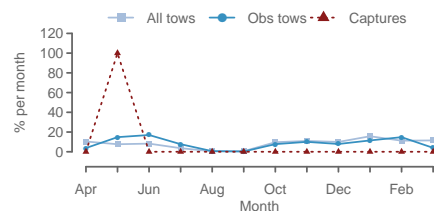


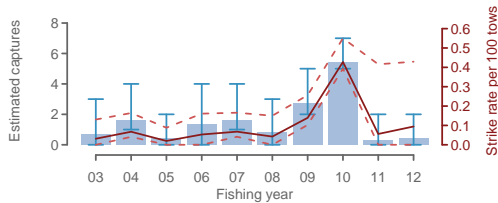
Figure 4: Annual time series of (a) estimated small bird captures, (b) observed white-capped albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.5 Other albatrosses captures, ORH3B east and south rise

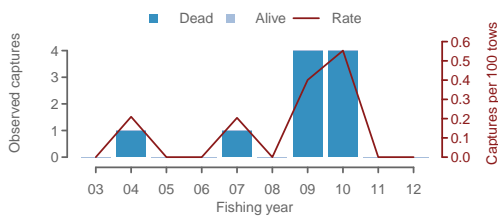
Table 8: Annual trawl effort, observer coverage, observed numbers of other albatrosses captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	1	0 - 3	0.0	0.0 - 0.1
2003–04	2439	20	1	0.2	2	1 - 4	0.1	0.0 - 0.2
2004–05	2273	30	0	-	0	0 - 2	0.0	0.0 - 0.1
2005–06	2488	16	0	-	1	0 - 4	0.1	0.0 - 0.2
2006–07	2414	20	1	0.2	2	1 - 4	0.1	0.0 - 0.2
2007–08	1999	47	0	-	1	0 - 3	0.0	0.0 - 0.2
2008–09	1952	51	4	0.4	3	2 - 5	0.1	0.1 - 0.3
2009–10	1272	57	4	0.6	5	5 - 7	0.4	0.4 - 0.6
2010–11	481	25	0	-	0	0 - 2	0.1	0.0 - 0.4
2011–12	466	26	0	-	0	0 - 2	0.1	0.0 - 0.4

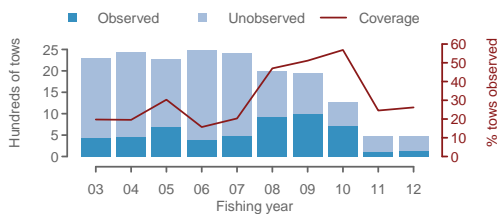
(a) Estimated captures



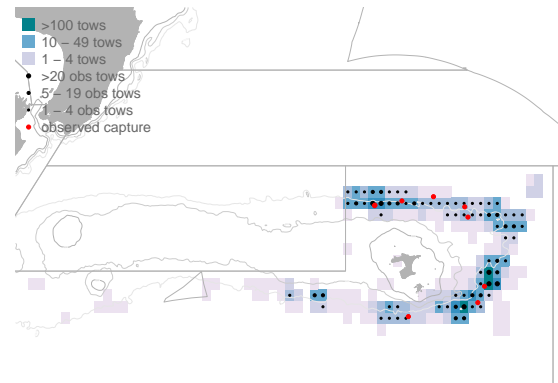
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

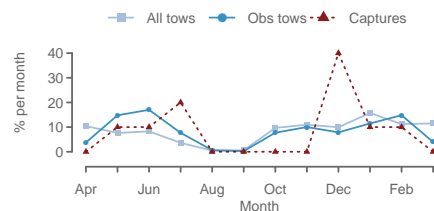


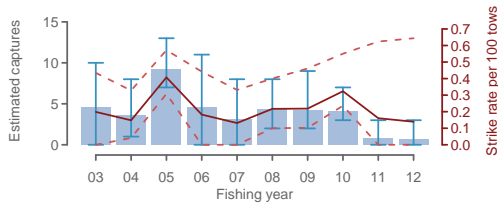
Figure 5: Annual time series of (a) estimated small bird captures, (b) observed other albatrosses captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.6 Small bird captures, ORH3B east and south rise

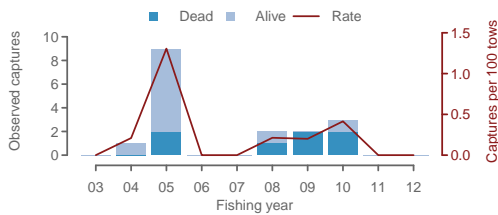
Table 9: Annual trawl effort, observer coverage, observed numbers of small bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	5	0 - 10	0.2	0.0 - 0.4
2003–04	2439	20	1	0.2	4	1 - 8	0.1	0.0 - 0.3
2004–05	2273	30	9	1.3	9	7 - 13	0.4	0.3 - 0.6
2005–06	2488	16	0	-	5	0 - 11	0.2	0.0 - 0.4
2006–07	2414	20	0	-	3	0 - 8	0.1	0.0 - 0.3
2007–08	1999	47	2	0.2	4	2 - 8	0.2	0.1 - 0.4
2008–09	1952	51	2	0.2	4	2 - 9	0.2	0.1 - 0.5
2009–10	1272	57	3	0.4	4	3 - 7	0.3	0.2 - 0.6
2010–11	481	25	0	-	1	0 - 3	0.2	0.0 - 0.6
2011–12	466	26	0	-	1	0 - 3	0.1	0.0 - 0.6

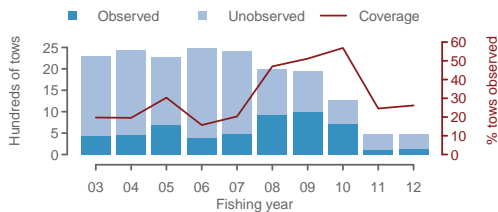
(a) Estimated captures



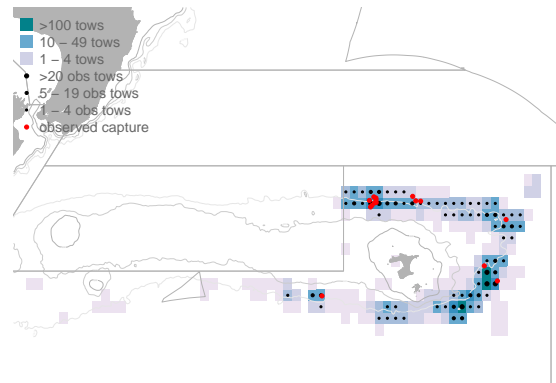
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

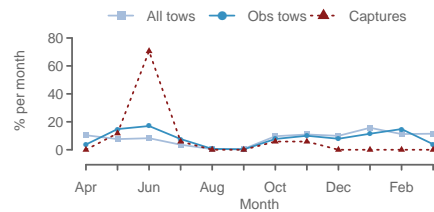


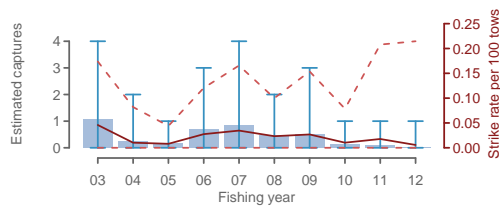
Figure 6: Annual time series of (a) estimated small bird captures, (b) observed small bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.7 Sooty shearwater captures, ORH3B east and south rise

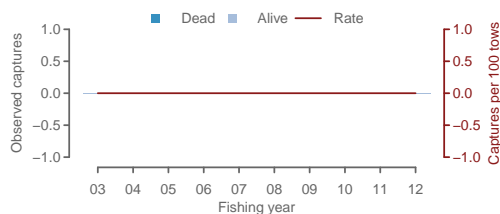
Table 10: Annual trawl effort, observer coverage, observed numbers of sooty shearwater captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	1	0 - 4	0.0	0.0 - 0.2
2003–04	2439	20	0	-	0	0 - 2	0.0	0.0 - 0.1
2004–05	2273	30	0	-	0	0 - 1	0.0	0.0 - 0.0
2005–06	2488	16	0	-	1	0 - 3	0.0	0.0 - 0.1
2006–07	2414	20	0	-	1	0 - 4	0.0	0.0 - 0.2
2007–08	1999	47	0	-	0	0 - 2	0.0	0.0 - 0.1
2008–09	1952	51	0	-	1	0 - 3	0.0	0.0 - 0.2
2009–10	1272	57	0	-	0	0 - 1	0.0	0.0 - 0.1
2010–11	481	25	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	466	26	0	-	0	0 - 1	0.0	0.0 - 0.2

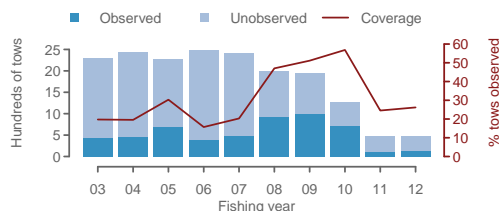
(a) Estimated captures



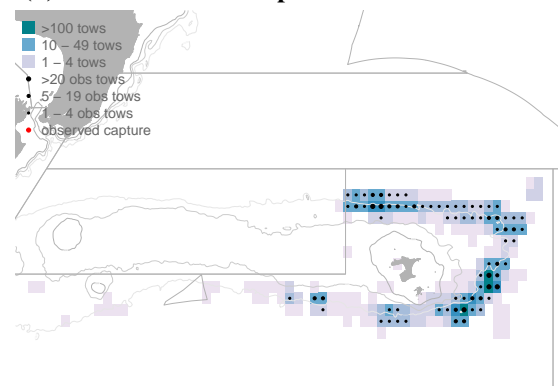
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

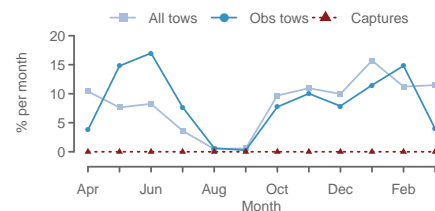


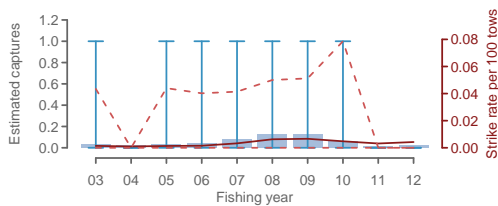
Figure 7: Annual time series of (a) estimated small bird captures, (b) observed sooty shearwater captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.8 White-chinned petrel captures, ORH3B east and south rise

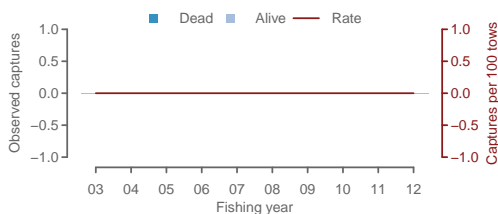
Table 11: Annual trawl effort, observer coverage, observed numbers of white-chinned petrel captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	0	0 - 1	0.0	0.0 - 0.0
2003–04	2439	20	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	2273	30	0	-	0	0 - 1	0.0	0.0 - 0.0
2005–06	2488	16	0	-	0	0 - 1	0.0	0.0 - 0.0
2006–07	2414	20	0	-	0	0 - 1	0.0	0.0 - 0.0
2007–08	1999	47	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	1952	51	0	-	0	0 - 1	0.0	0.0 - 0.1
2009–10	1272	57	0	-	0	0 - 1	0.0	0.0 - 0.1
2010–11	481	25	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	466	26	0	-	0	0 - 0	0.0	0.0 - 0.0

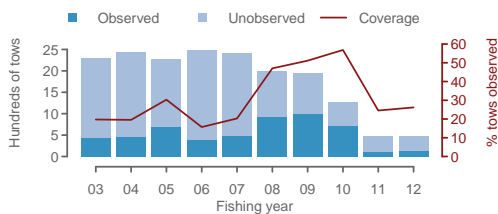
(a) Estimated captures



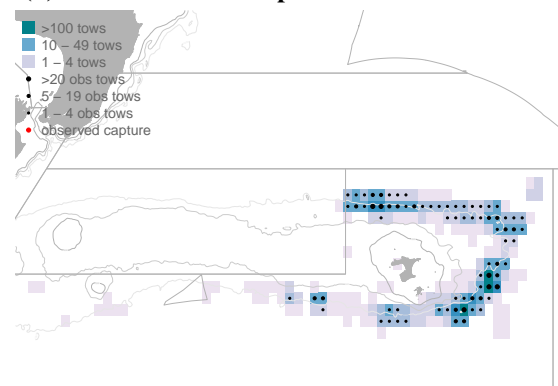
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

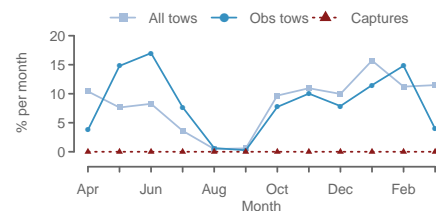


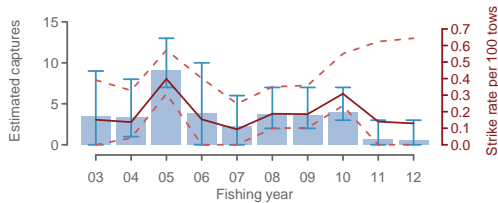
Figure 8: Annual time series of (a) estimated small bird captures, (b) observed white-chinned petrel captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.9 Other birds captures, ORH3B east and south rise

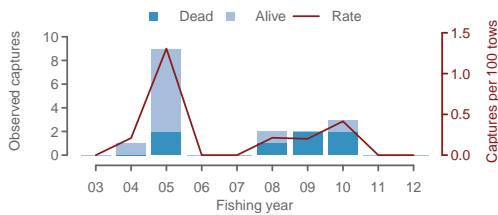
Table 12: Annual trawl effort, observer coverage, observed numbers of other birds captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	3	0 - 9	0.2	0.0 - 0.4
2003–04	2439	20	1	0.2	3	1 - 8	0.1	0.0 - 0.3
2004–05	2273	30	9	1.3	9	7 - 13	0.4	0.3 - 0.6
2005–06	2488	16	0	-	4	0 - 10	0.2	0.0 - 0.4
2006–07	2414	20	0	-	2	0 - 6	0.1	0.0 - 0.2
2007–08	1999	47	2	0.2	4	2 - 7	0.2	0.1 - 0.4
2008–09	1952	51	2	0.2	4	2 - 7	0.2	0.1 - 0.4
2009–10	1272	57	3	0.4	4	3 - 7	0.3	0.2 - 0.6
2010–11	481	25	0	-	1	0 - 3	0.1	0.0 - 0.6
2011–12	466	26	0	-	1	0 - 3	0.1	0.0 - 0.6

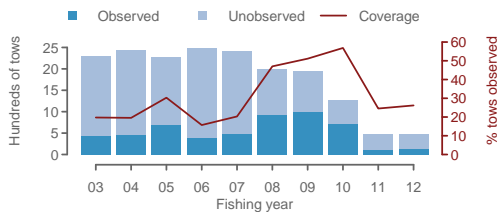
(a) Estimated captures



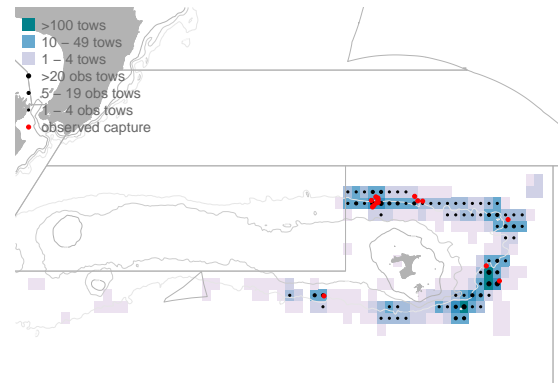
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

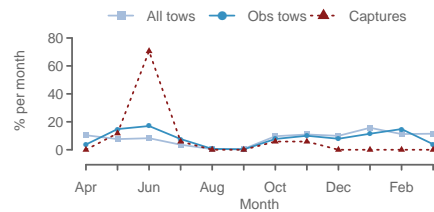


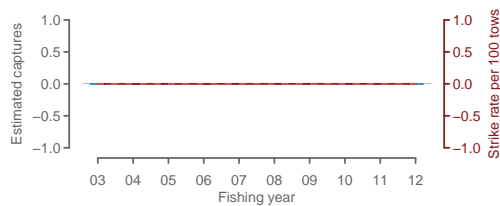
Figure 9: Annual time series of (a) estimated small bird captures, (b) observed other birds captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.10 Fur seal captures, ORH3B east and south rise

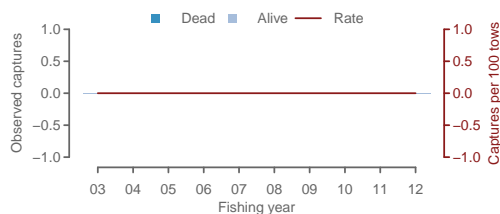
Table 13: Annual trawl effort, observer coverage, observed numbers of fur seal captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B east and south rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2301	20	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	2439	20	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	2273	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	2488	16	0	-	0	0 - 0	0.0	0.0 - 0.0
2006–07	2414	20	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	1999	47	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	1952	51	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	1272	57	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	481	25	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	466	26	0	-	0	0 - 0	0.0	0.0 - 0.0

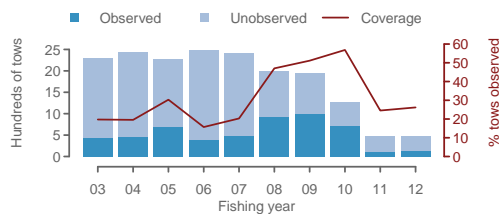
(a) Estimated captures



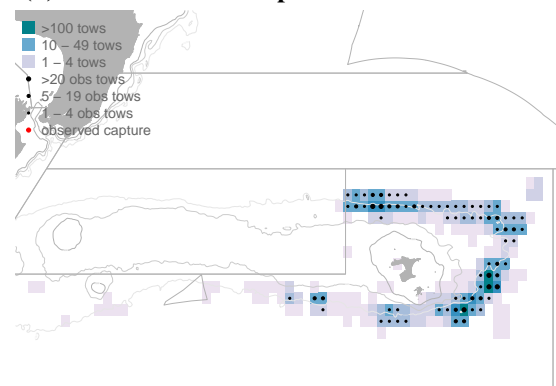
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

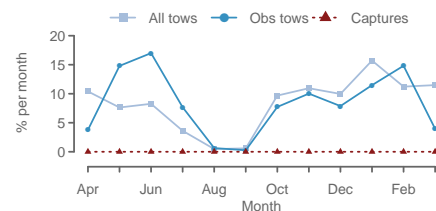


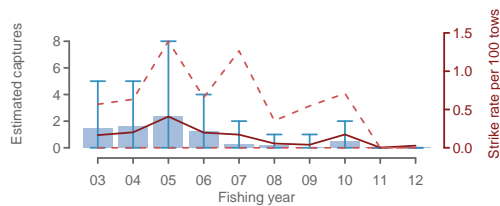
Figure 10: Annual time series of (a) estimated small bird captures, (b) observed fur seal captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B east and south rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.11 Large bird captures, ORH3B north west rise

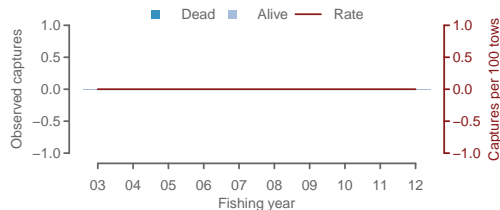
Table 14: Annual trawl effort, observer coverage, observed numbers of large bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	1	0 - 5	0.2	0.0 - 0.6
2003–04	790	6	0	-	2	0 - 5	0.2	0.0 - 0.6
2004–05	575	15	0	-	2	0 - 8	0.4	0.0 - 1.4
2005–06	609	18	0	-	1	0 - 4	0.2	0.0 - 0.7
2006–07	158	22	0	-	0	0 - 2	0.2	0.0 - 1.3
2007–08	283	64	0	-	0	0 - 1	0.1	0.0 - 0.4
2008–09	183	33	0	-	0	0 - 1	0.0	0.0 - 0.5
2009–10	282	30	0	-	0	0 - 2	0.2	0.0 - 0.7
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

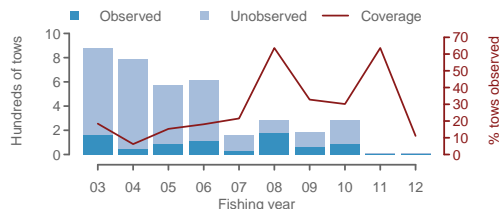
(a) Estimated captures



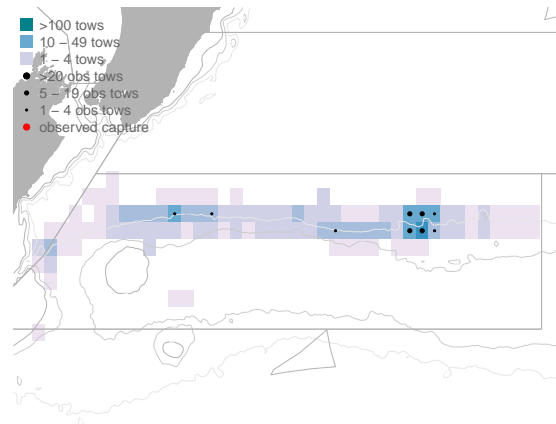
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

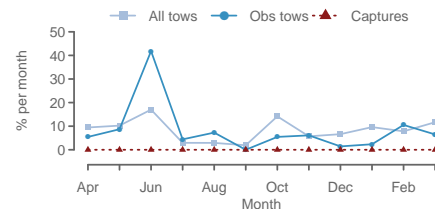


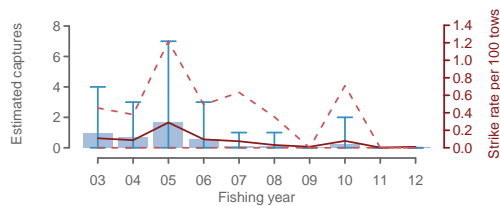
Figure 11: Annual time series of (a) estimated small bird captures, (b) observed large bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.12 Salvin's albatross captures, ORH3B north west rise

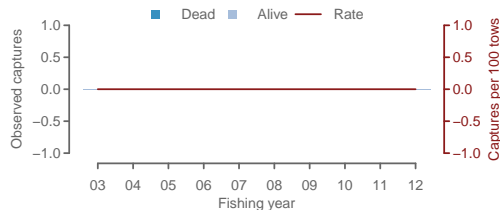
Table 15: Annual trawl effort, observer coverage, observed numbers of Salvin's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	880	18	0	-	1	0 - 4	0.1	0.0 - 0.5
2003-04	790	6	0	-	1	0 - 3	0.1	0.0 - 0.4
2004-05	575	15	0	-	2	0 - 7	0.3	0.0 - 1.2
2005-06	609	18	0	-	1	0 - 3	0.1	0.0 - 0.5
2006-07	158	22	0	-	0	0 - 1	0.1	0.0 - 0.6
2007-08	283	64	0	-	0	0 - 1	0.0	0.0 - 0.4
2008-09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009-10	282	30	0	-	0	0 - 2	0.1	0.0 - 0.7
2010-11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

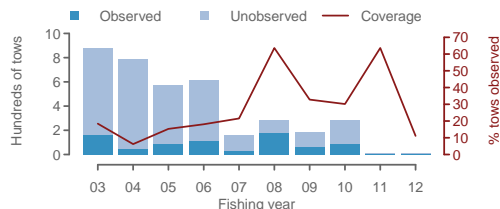
(a) Estimated captures



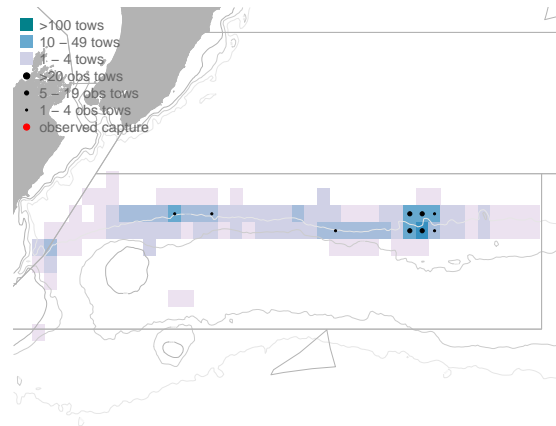
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

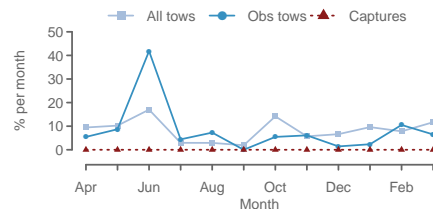


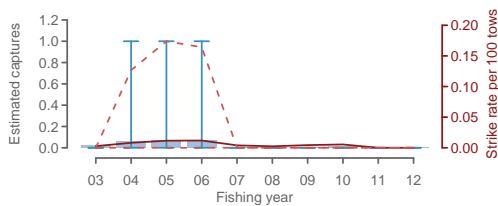
Figure 12: Annual time series of (a) estimated small bird captures, (b) observed Salvin's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.13 Buller's albatross captures, ORH3B north west rise

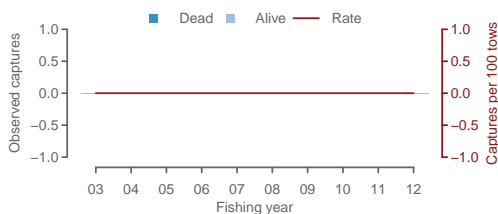
Table 16: Annual trawl effort, observer coverage, observed numbers of Buller's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	880	18	0	-	0	0 - 0	0.0	0.0 - 0.0
2003-04	790	6	0	-	0	0 - 1	0.0	0.0 - 0.1
2004-05	575	15	0	-	0	0 - 1	0.0	0.0 - 0.2
2005-06	609	18	0	-	0	0 - 1	0.0	0.0 - 0.2
2006-07	158	22	0	-	0	0 - 0	0.0	0.0 - 0.0
2007-08	283	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2008-09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009-10	282	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2010-11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

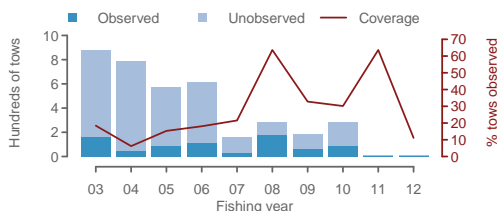
(a) Estimated captures



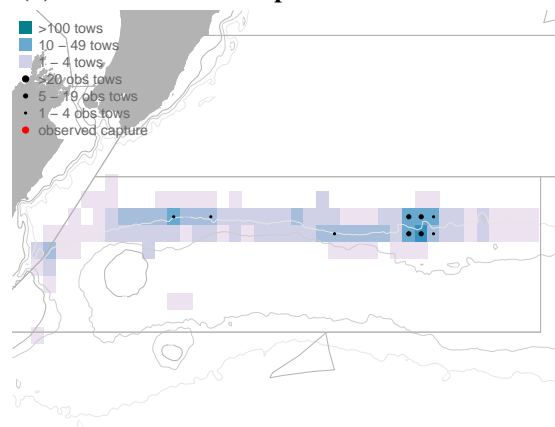
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

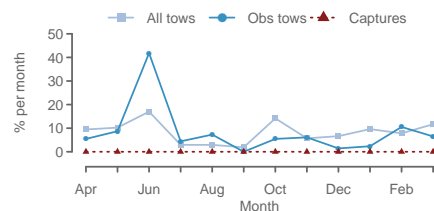


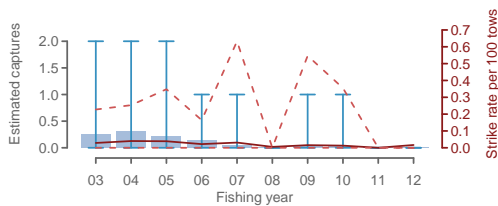
Figure 13: Annual time series of (a) estimated small bird captures, (b) observed Buller's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.14 White-capped albatross captures, ORH3B north west rise

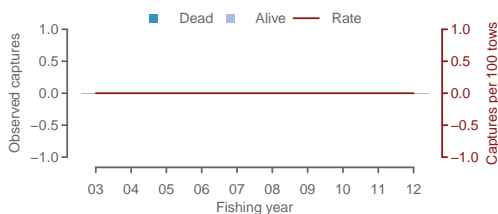
Table 17: Annual trawl effort, observer coverage, observed numbers of white-capped albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	0	0 - 2	0.0	0.0 - 0.2
2003–04	790	6	0	-	0	0 - 2	0.0	0.0 - 0.3
2004–05	575	15	0	-	0	0 - 2	0.0	0.0 - 0.3
2005–06	609	18	0	-	0	0 - 1	0.0	0.0 - 0.2
2006–07	158	22	0	-	0	0 - 1	0.0	0.0 - 0.6
2007–08	283	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	183	33	0	-	0	0 - 1	0.0	0.0 - 0.5
2009–10	282	30	0	-	0	0 - 1	0.0	0.0 - 0.4
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

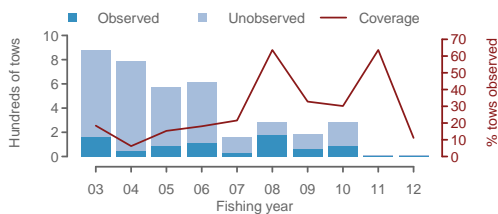
(a) Estimated captures



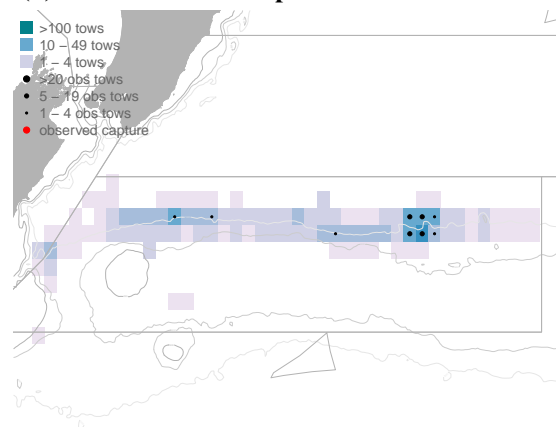
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

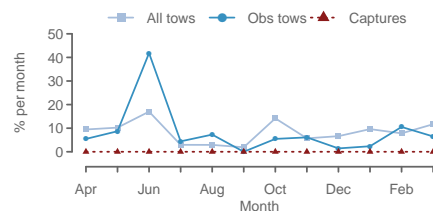


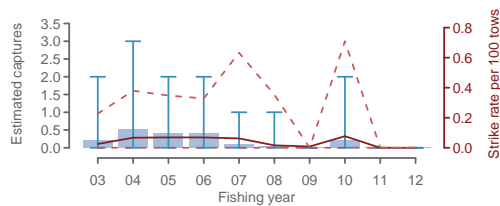
Figure 14: Annual time series of (a) estimated small bird captures, (b) observed white-capped albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.15 Other albatrosses captures, ORH3B north west rise

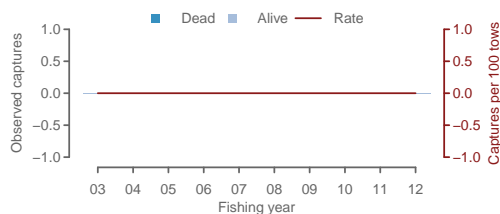
Table 18: Annual trawl effort, observer coverage, observed numbers of other albatrosses captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	0	0 - 2	0.0	0.0 - 0.2
2003–04	790	6	0	-	1	0 - 3	0.1	0.0 - 0.4
2004–05	575	15	0	-	0	0 - 2	0.1	0.0 - 0.3
2005–06	609	18	0	-	0	0 - 2	0.1	0.0 - 0.3
2006–07	158	22	0	-	0	0 - 1	0.1	0.0 - 0.6
2007–08	283	64	0	-	0	0 - 1	0.0	0.0 - 0.4
2008–09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	282	30	0	-	0	0 - 2	0.1	0.0 - 0.7
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

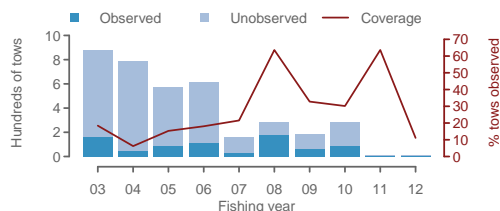
(a) Estimated captures



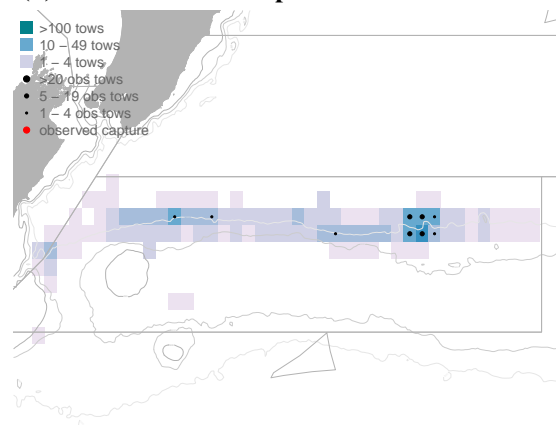
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

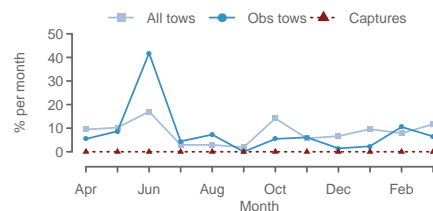


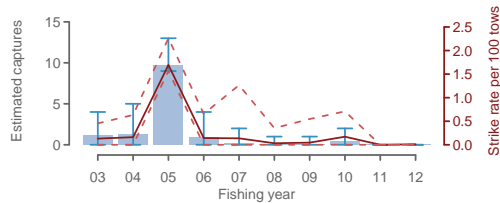
Figure 15: Annual time series of (a) estimated small bird captures, (b) observed other albatrosses captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.16 Small bird captures, ORH3B north west rise

Table 19: Annual trawl effort, observer coverage, observed numbers of small bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	1	0 - 4	0.1	0.0 - 0.5
2003–04	790	6	0	-	1	0 - 5	0.2	0.0 - 0.6
2004–05	575	15	9	10.2	10	9 - 13	1.7	1.6 - 2.3
2005–06	609	18	0	-	1	0 - 4	0.1	0.0 - 0.7
2006–07	158	22	0	-	0	0 - 2	0.1	0.0 - 1.3
2007–08	283	64	0	-	0	0 - 1	0.0	0.0 - 0.4
2008–09	183	33	0	-	0	0 - 1	0.0	0.0 - 0.5
2009–10	282	30	0	-	0	0 - 2	0.2	0.0 - 0.7
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

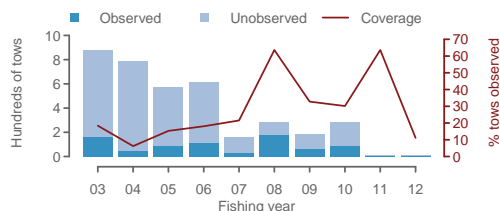
(a) Estimated captures



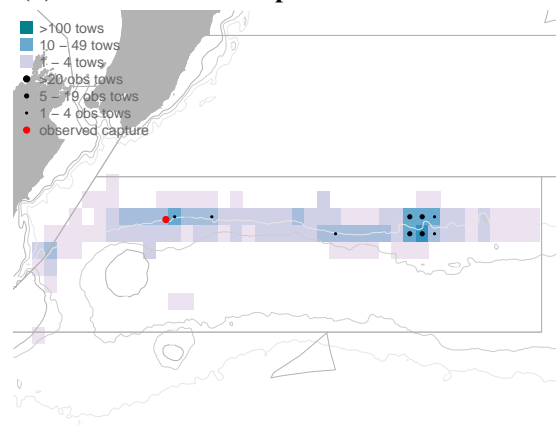
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

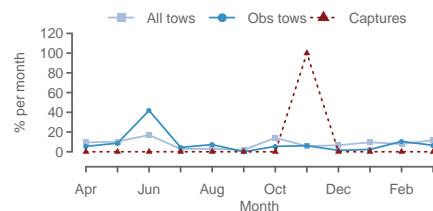


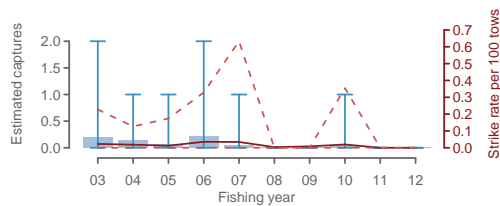
Figure 16: Annual time series of (a) estimated small bird captures, (b) observed small bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.17 Sooty shearwater captures, ORH3B north west rise

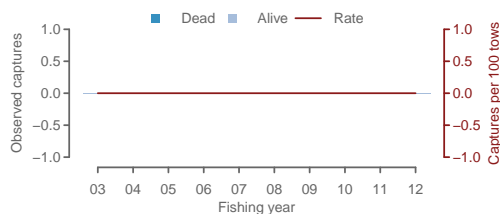
Table 20: Annual trawl effort, observer coverage, observed numbers of sooty shearwater captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	0	0 - 2	0.0	0.0 - 0.2
2003–04	790	6	0	-	0	0 - 1	0.0	0.0 - 0.1
2004–05	575	15	0	-	0	0 - 1	0.0	0.0 - 0.2
2005–06	609	18	0	-	0	0 - 2	0.0	0.0 - 0.3
2006–07	158	22	0	-	0	0 - 1	0.0	0.0 - 0.6
2007–08	283	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	282	30	0	-	0	0 - 1	0.0	0.0 - 0.4
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

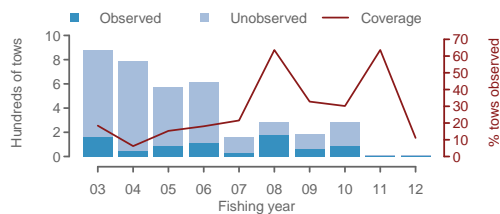
(a) Estimated captures



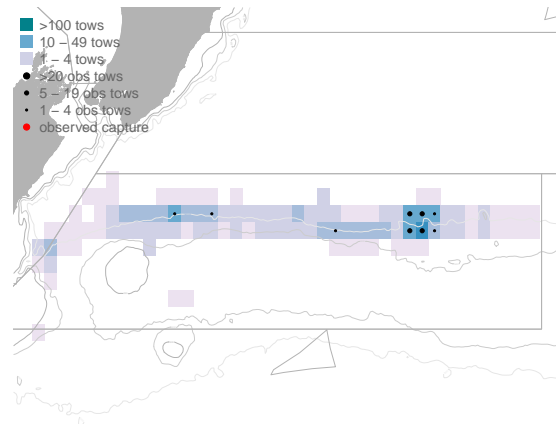
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

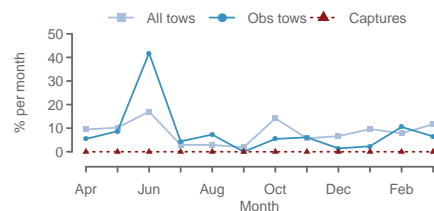


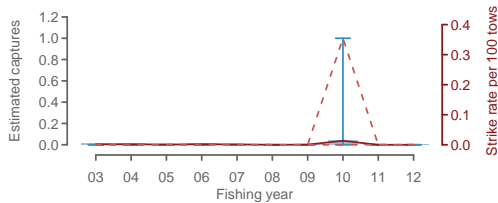
Figure 17: Annual time series of (a) estimated small bird captures, (b) observed sooty shearwater captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.18 White-chinned petrel captures, ORH3B north west rise

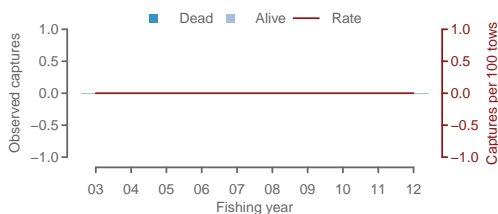
Table 21: Annual trawl effort, observer coverage, observed numbers of white-chinned petrel captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	790	6	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	575	15	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	609	18	0	-	0	0 - 0	0.0	0.0 - 0.0
2006–07	158	22	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	283	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	282	30	0	-	0	0 - 1	0.0	0.0 - 0.4
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

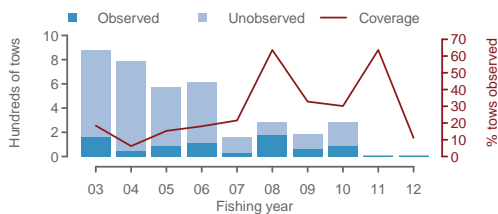
(a) Estimated captures



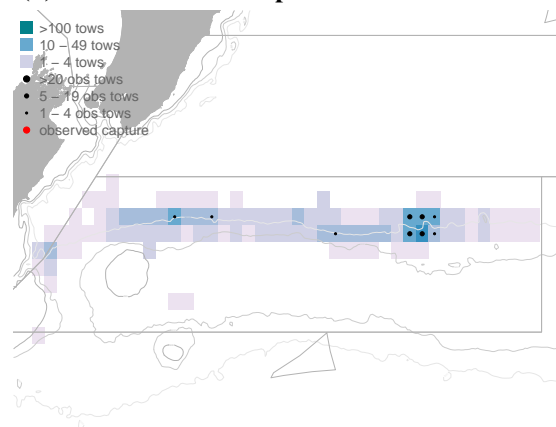
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

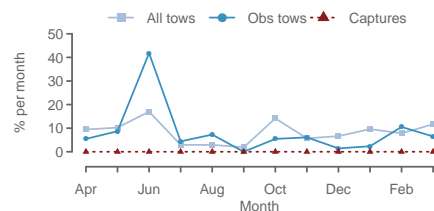


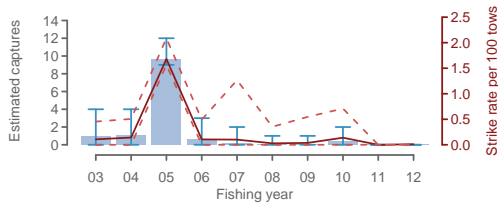
Figure 18: Annual time series of (a) estimated small bird captures, (b) observed white-chinned petrel captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.19 Other birds captures, ORH3B north west rise

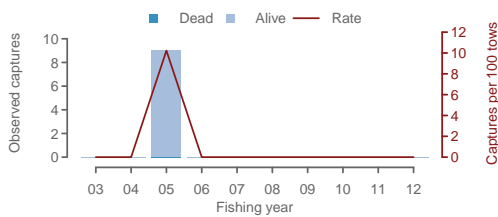
Table 22: Annual trawl effort, observer coverage, observed numbers of other birds captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	1	0 - 4	0.1	0.0 - 0.5
2003–04	790	6	0	-	1	0 - 4	0.1	0.0 - 0.5
2004–05	575	15	9	10.2	10	9 - 12	1.7	1.6 - 2.1
2005–06	609	18	0	-	1	0 - 3	0.1	0.0 - 0.5
2006–07	158	22	0	-	0	0 - 2	0.1	0.0 - 1.3
2007–08	283	64	0	-	0	0 - 1	0.0	0.0 - 0.4
2008–09	183	33	0	-	0	0 - 1	0.0	0.0 - 0.5
2009–10	282	30	0	-	0	0 - 2	0.1	0.0 - 0.7
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

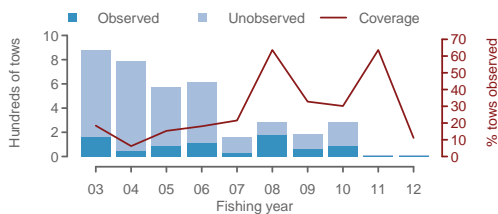
(a) Estimated captures



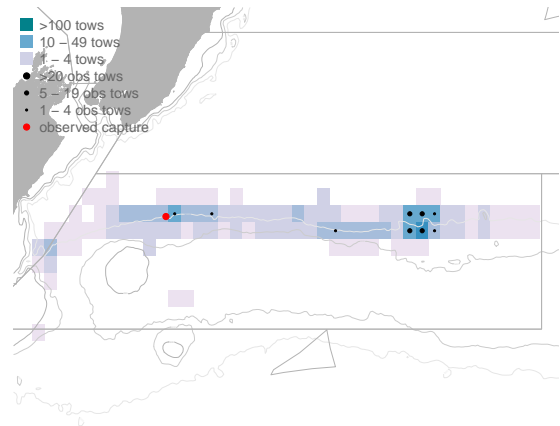
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

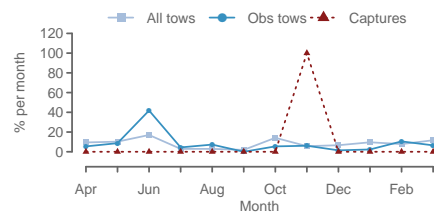


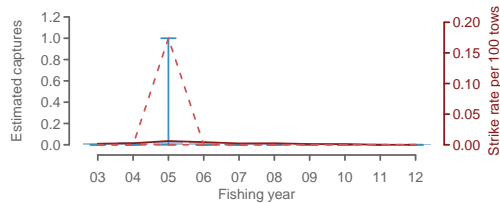
Figure 19: Annual time series of (a) estimated small bird captures, (b) observed other birds captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.20 Fur seal captures, ORH3B north west rise

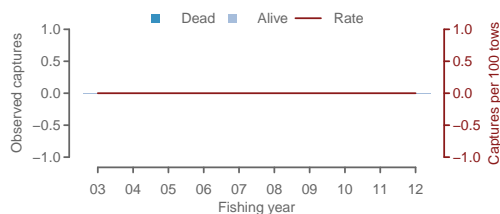
Table 23: Annual trawl effort, observer coverage, observed numbers of fur seal captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH3B north west rise.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	880	18	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	790	6	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	575	15	0	-	0	0 - 1	0.0	0.0 - 0.2
2005–06	609	18	0	-	0	0 - 0	0.0	0.0 - 0.0
2006–07	158	22	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	283	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	183	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	282	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	11	64	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	9	11	0	-	0	0 - 0	0.0	0.0 - 0.0

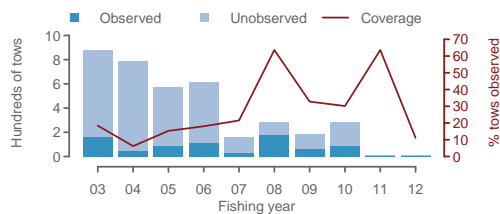
(a) Estimated captures



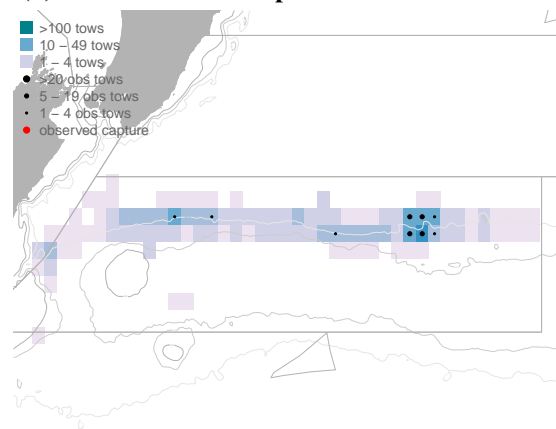
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

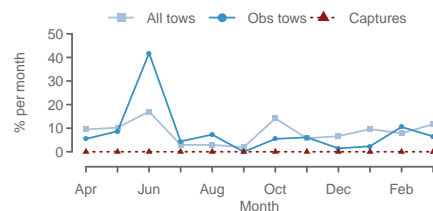


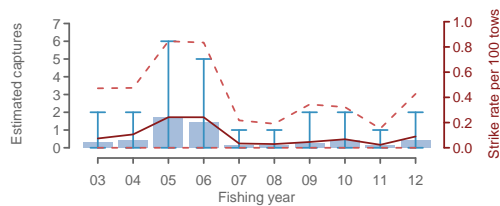
Figure 20: Annual time series of (a) estimated small bird captures, (b) observed fur seal captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH3B north west rise. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.21 Large bird captures, ORH mid east coast

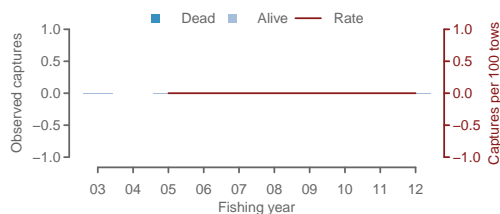
Table 24: Annual trawl effort, observer coverage, observed numbers of large bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 2	0.1	0.0 - 0.5
2003–04	421	0	0	-	0	0 - 2	0.1	0.0 - 0.5
2004–05	710	1	0	-	2	0 - 6	0.2	0.0 - 0.8
2005–06	599	1	0	-	1	0 - 5	0.2	0.0 - 0.8
2006–07	460	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2007–08	525	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2008–09	581	1	0	-	0	0 - 2	0.0	0.0 - 0.3
2009–10	620	8	0	-	0	0 - 2	0.1	0.0 - 0.3
2010–11	658	16	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	468	12	0	-	0	0 - 2	0.1	0.0 - 0.4

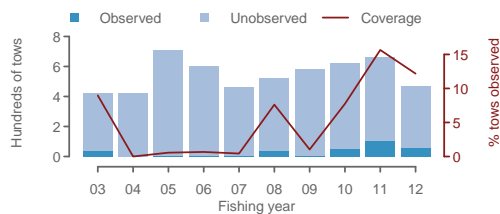
(a) Estimated captures



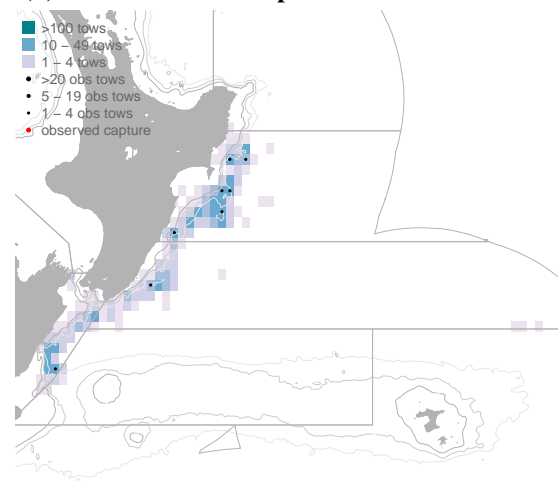
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

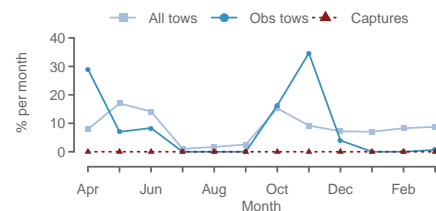


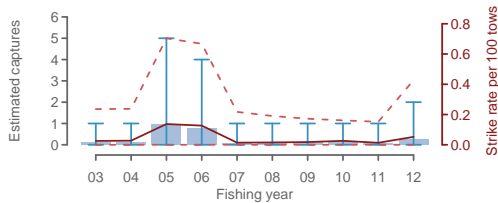
Figure 21: Annual time series of (a) estimated small bird captures, (b) observed large bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.22 Salvin's albatross captures, ORH mid east coast

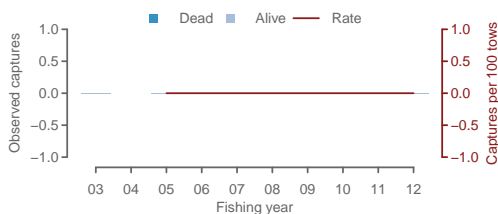
Table 25: Annual trawl effort, observer coverage, observed numbers of Salvin's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	424	9	0	-	0	0 - 1	0.0	0.0 - 0.2
2003-04	421	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2004-05	710	1	0	-	1	0 - 5	0.1	0.0 - 0.7
2005-06	599	1	0	-	1	0 - 4	0.1	0.0 - 0.7
2006-07	460	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2007-08	525	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2008-09	581	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2009-10	620	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2010-11	658	16	0	-	0	0 - 1	0.0	0.0 - 0.2
2011-12	468	12	0	-	0	0 - 2	0.1	0.0 - 0.4

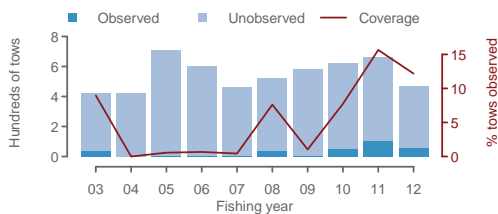
(a) Estimated captures



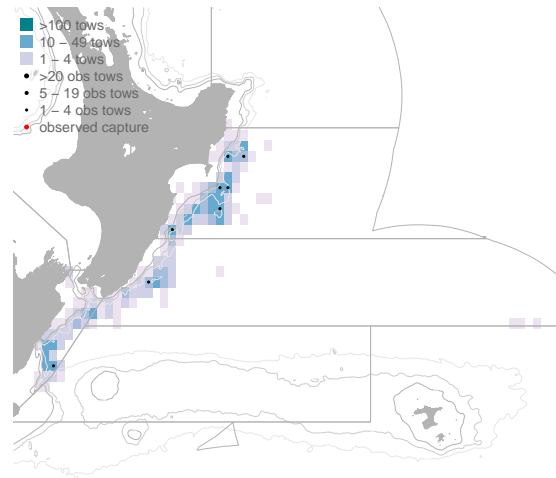
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

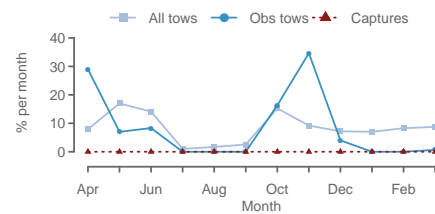


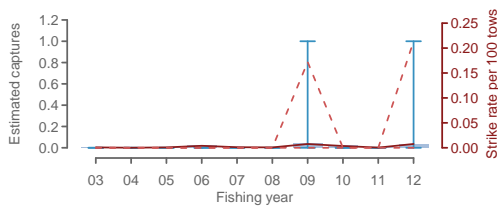
Figure 22: Annual time series of (a) estimated small bird captures, (b) observed Salvin's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.23 Buller's albatross captures, ORH mid east coast

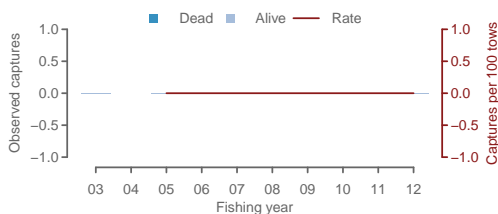
Table 26: Annual trawl effort, observer coverage, observed numbers of Buller's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	424	9	0	-	0	0 - 0	0.0	0.0 - 0.0
2003-04	421	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2004-05	710	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2005-06	599	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2006-07	460	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2007-08	525	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2008-09	581	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2009-10	620	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2010-11	658	16	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	468	12	0	-	0	0 - 1	0.0	0.0 - 0.2

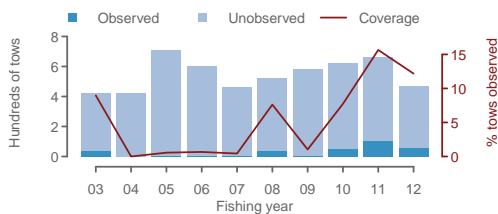
(a) Estimated captures



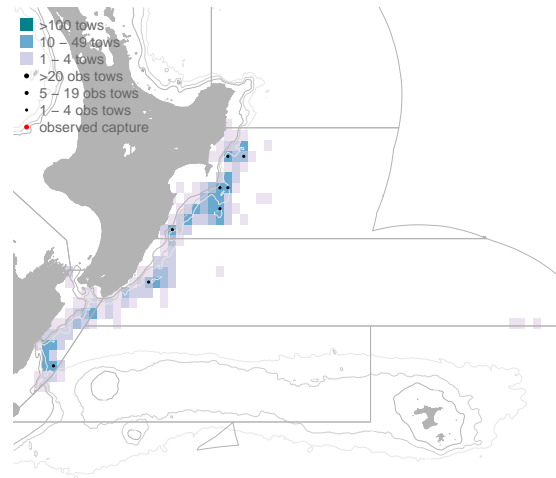
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

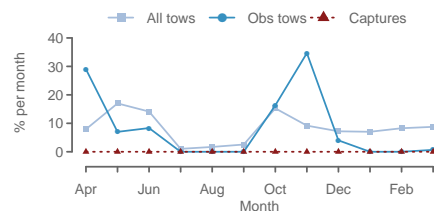


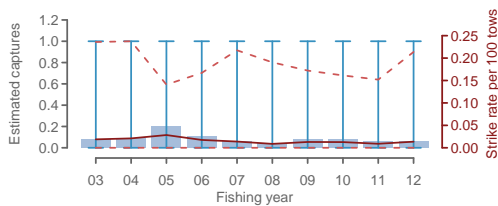
Figure 23: Annual time series of (a) estimated small bird captures, (b) observed Buller's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.24 White-capped albatross captures, ORH mid east coast

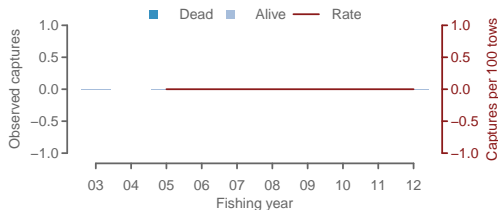
Table 27: Annual trawl effort, observer coverage, observed numbers of white-capped albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 1	0.0	0.0 - 0.2
2003–04	421	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2004–05	710	1	0	-	0	0 - 1	0.0	0.0 - 0.1
2005–06	599	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2006–07	460	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2007–08	525	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2008–09	581	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2009–10	620	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2010–11	658	16	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	468	12	0	-	0	0 - 1	0.0	0.0 - 0.2

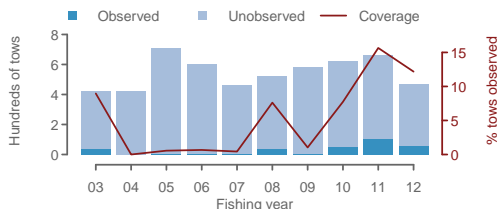
(a) Estimated captures



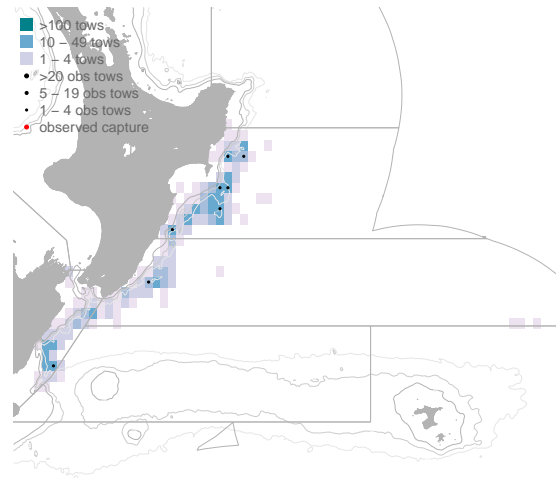
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

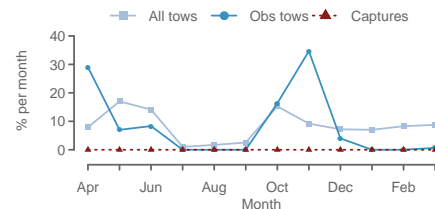


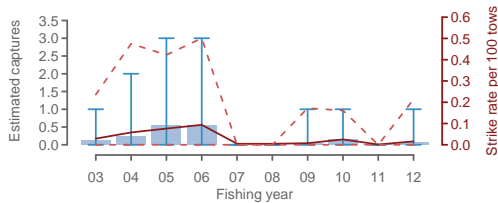
Figure 24: Annual time series of (a) estimated small bird captures, (b) observed white-capped albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.25 Other albatrosses captures, ORH mid east coast

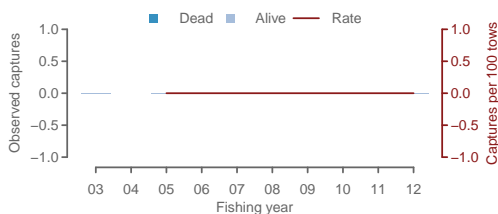
Table 28: Annual trawl effort, observer coverage, observed numbers of other albatrosses captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 1	0.0	0.0 - 0.2
2003–04	421	0	0	-	0	0 - 2	0.1	0.0 - 0.5
2004–05	710	1	0	-	1	0 - 3	0.1	0.0 - 0.4
2005–06	599	1	0	-	1	0 - 3	0.1	0.0 - 0.5
2006–07	460	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	525	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	581	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2009–10	620	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2010–11	658	16	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	468	12	0	-	0	0 - 1	0.0	0.0 - 0.2

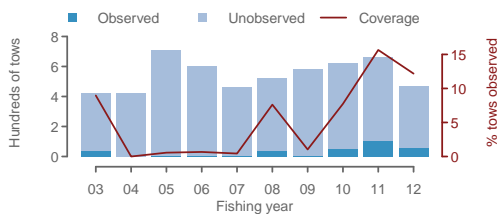
(a) Estimated captures



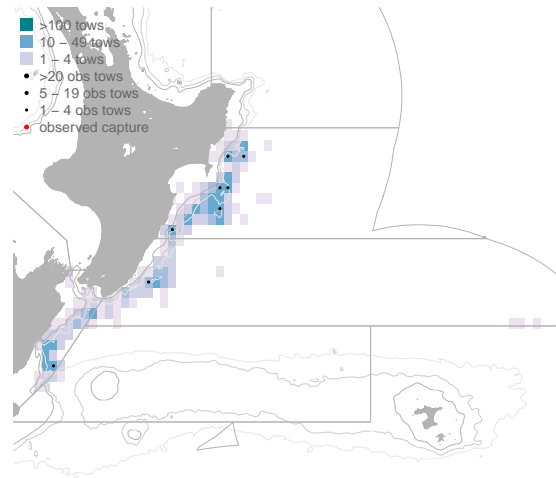
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

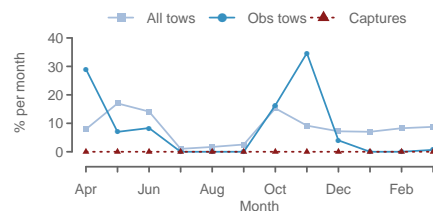


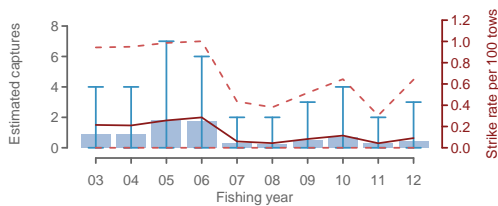
Figure 25: Annual time series of (a) estimated small bird captures, (b) observed other albatrosses captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.26 Small bird captures, ORH mid east coast

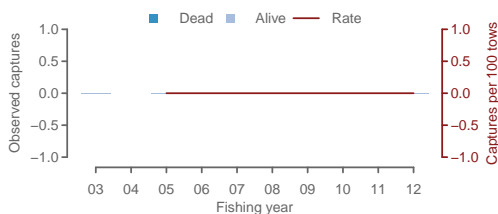
Table 29: Annual trawl effort, observer coverage, observed numbers of small bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	1	0 - 4	0.2	0.0 - 0.9
2003–04	421	0	0	-	1	0 - 4	0.2	0.0 - 1.0
2004–05	710	1	0	-	2	0 - 7	0.3	0.0 - 1.0
2005–06	599	1	0	-	2	0 - 6	0.3	0.0 - 1.0
2006–07	460	0	0	-	0	0 - 2	0.1	0.0 - 0.4
2007–08	525	8	0	-	0	0 - 2	0.0	0.0 - 0.4
2008–09	581	1	0	-	0	0 - 3	0.1	0.0 - 0.5
2009–10	620	8	0	-	1	0 - 4	0.1	0.0 - 0.6
2010–11	658	16	0	-	0	0 - 2	0.0	0.0 - 0.3
2011–12	468	12	0	-	0	0 - 3	0.1	0.0 - 0.6

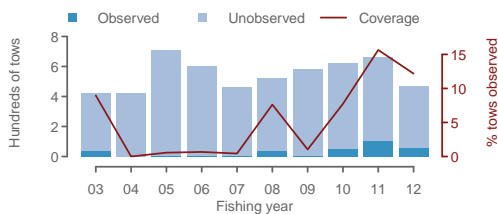
(a) Estimated captures



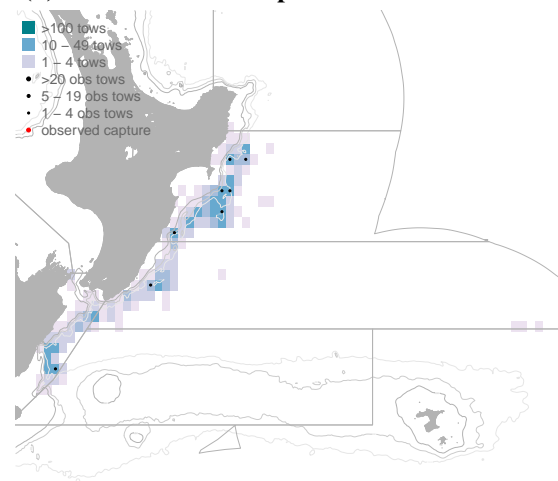
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

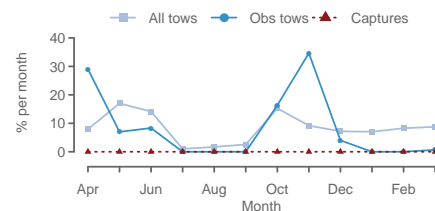


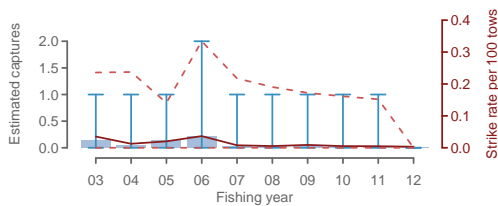
Figure 26: Annual time series of (a) estimated small bird captures, (b) observed small bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.27 Sooty shearwater captures, ORH mid east coast

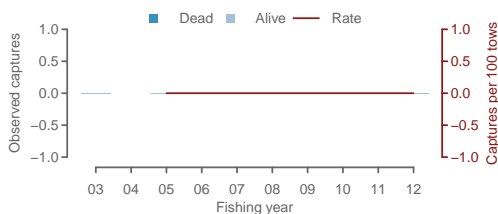
Table 30: Annual trawl effort, observer coverage, observed numbers of sooty shearwater captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 1	0.0	0.0 - 0.2
2003–04	421	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2004–05	710	1	0	-	0	0 - 1	0.0	0.0 - 0.1
2005–06	599	1	0	-	0	0 - 2	0.0	0.0 - 0.3
2006–07	460	0	0	-	0	0 - 1	0.0	0.0 - 0.2
2007–08	525	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2008–09	581	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2009–10	620	8	0	-	0	0 - 1	0.0	0.0 - 0.2
2010–11	658	16	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	468	12	0	-	0	0 - 0	0.0	0.0 - 0.0

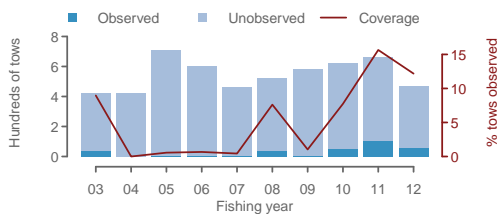
(a) Estimated captures



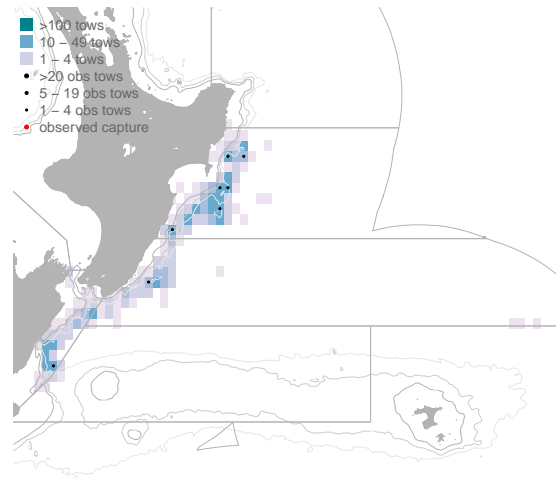
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

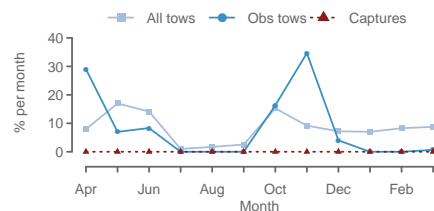


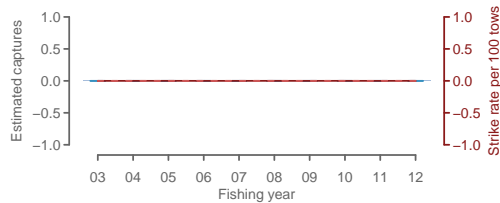
Figure 27: Annual time series of (a) estimated small bird captures, (b) observed sooty shearwater captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.28 White-chinned petrel captures, ORH mid east coast

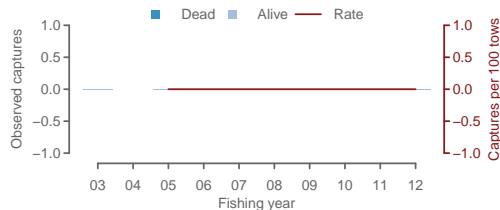
Table 31: Annual trawl effort, observer coverage, observed numbers of white-chinned petrel captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	421	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	710	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	599	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2006–07	460	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	525	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	581	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	620	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	658	16	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	468	12	0	-	0	0 - 0	0.0	0.0 - 0.0

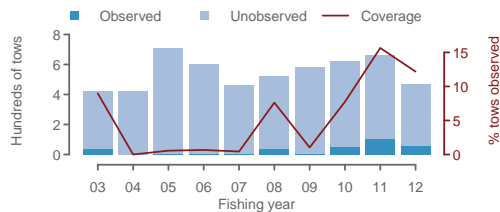
(a) Estimated captures



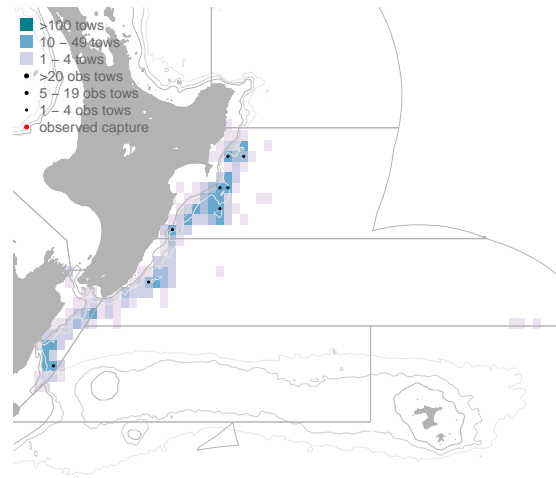
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

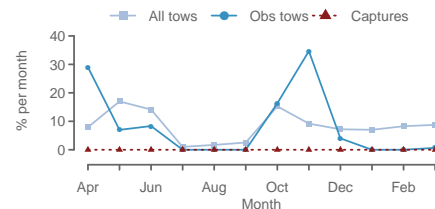


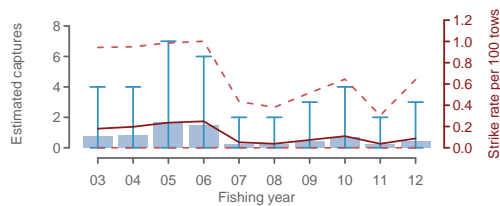
Figure 28: Annual time series of (a) estimated small bird captures, (b) observed white-chinned petrel captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.29 Other birds captures, ORH mid east coast

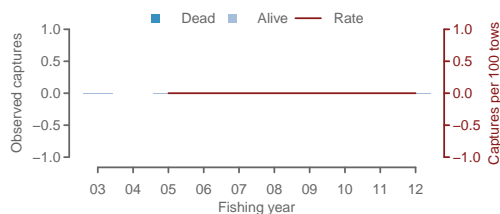
Table 32: Annual trawl effort, observer coverage, observed numbers of other birds captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	1	0 - 4	0.2	0.0 - 0.9
2003–04	421	0	0	-	1	0 - 4	0.2	0.0 - 1.0
2004–05	710	1	0	-	2	0 - 7	0.2	0.0 - 1.0
2005–06	599	1	0	-	1	0 - 6	0.2	0.0 - 1.0
2006–07	460	0	0	-	0	0 - 2	0.1	0.0 - 0.4
2007–08	525	8	0	-	0	0 - 2	0.0	0.0 - 0.4
2008–09	581	1	0	-	0	0 - 3	0.1	0.0 - 0.5
2009–10	620	8	0	-	1	0 - 4	0.1	0.0 - 0.6
2010–11	658	16	0	-	0	0 - 2	0.0	0.0 - 0.3
2011–12	468	12	0	-	0	0 - 3	0.1	0.0 - 0.6

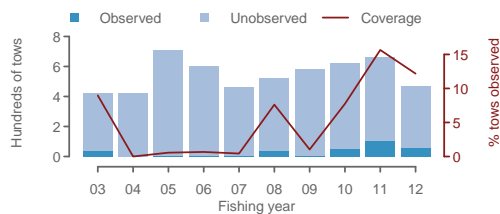
(a) Estimated captures



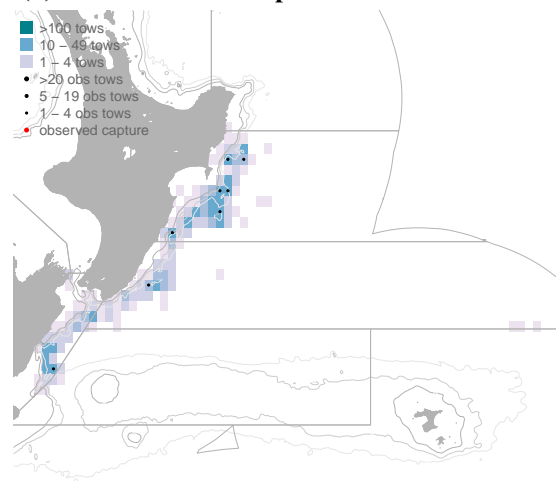
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

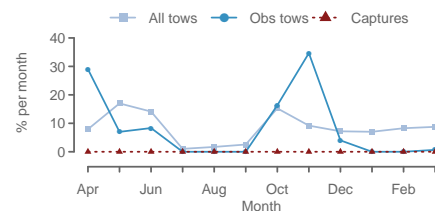


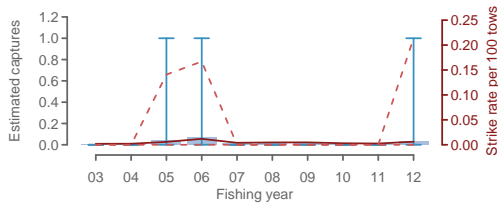
Figure 29: Annual time series of (a) estimated small bird captures, (b) observed other birds captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.30 Fur seal captures, ORH mid east coast

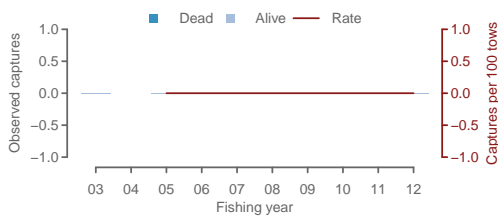
Table 33: Annual trawl effort, observer coverage, observed numbers of fur seal captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH mid east coast.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	424	9	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	421	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	710	1	0	-	0	0 - 1	0.0	0.0 - 0.1
2005–06	599	1	0	-	0	0 - 1	0.0	0.0 - 0.2
2006–07	460	0	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	525	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	581	1	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	620	8	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	658	16	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	468	12	0	-	0	0 - 1	0.0	0.0 - 0.2

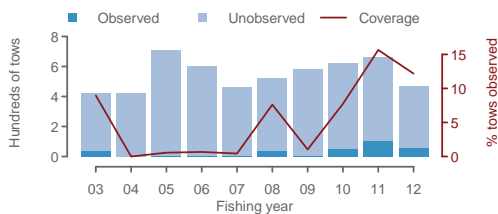
(a) Estimated captures



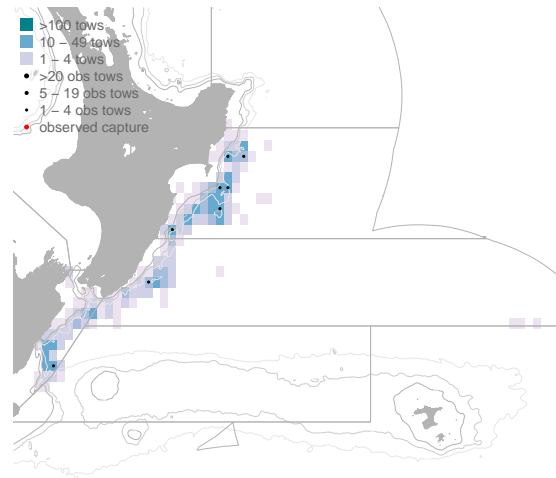
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

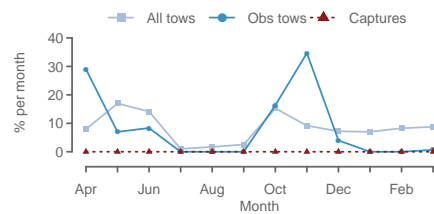


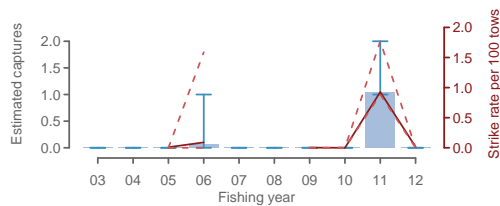
Figure 30: Annual time series of (a) estimated small bird captures, (b) observed fur seal captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH mid east coast. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.31 Large bird captures, ORH7A challenger

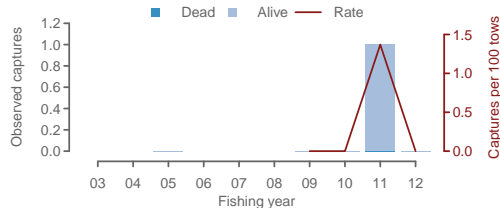
Table 34: Annual trawl effort, observer coverage, observed numbers of large bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed		Est. captures		Est. capture rate		
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.3	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 1	0.1	0.0 - 1.6
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	1	1.4	1	1 - 2	0.9	0.9 - 1.8
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

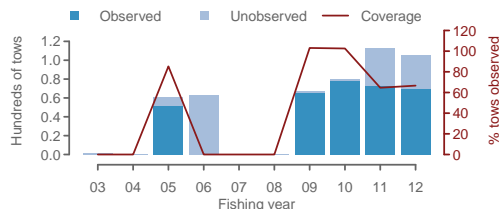
(a) Estimated captures



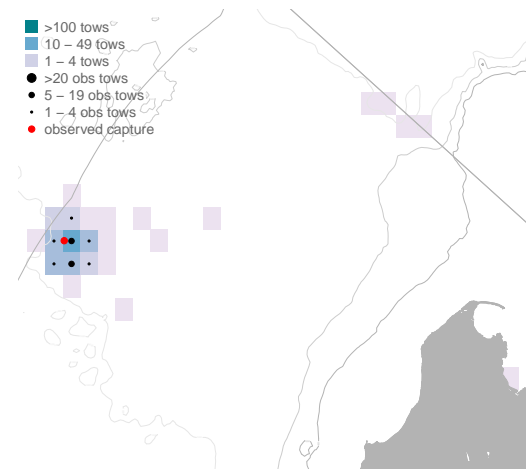
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

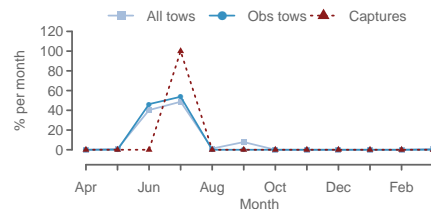


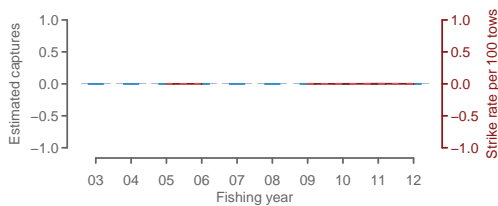
Figure 31: Annual time series of (a) estimated small bird captures, (b) observed large bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.32 Salvin's albatross captures, ORH7A challenger

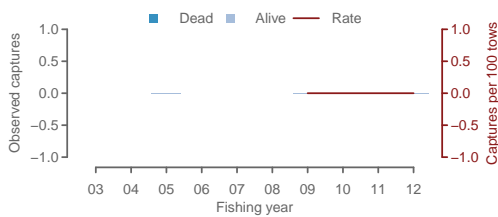
Table 35: Annual trawl effort, observer coverage, observed numbers of Salvin's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	2	0			0	0 - 0	0.0	0.0 - 0.0
2003-04	0	-			-			
2004-05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005-06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006-07	0	-			-			
2007-08	0	-			-			
2008-09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009-10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010-11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

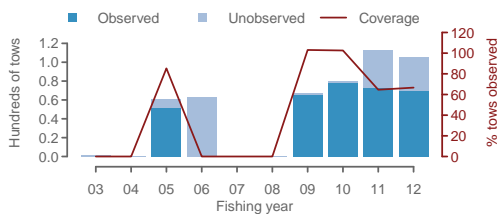
(a) Estimated captures



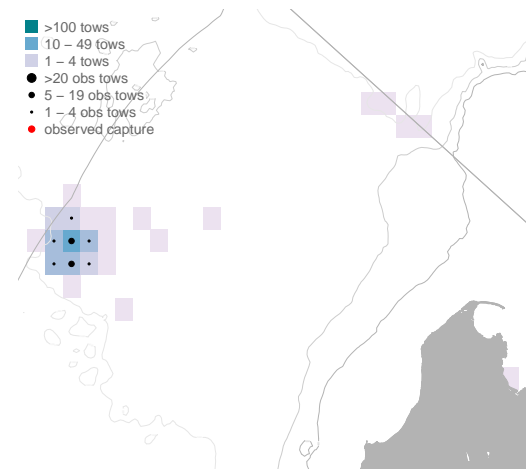
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

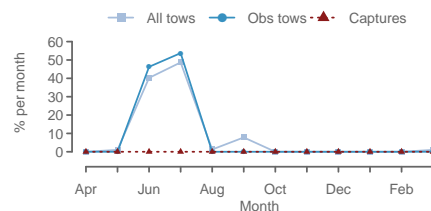


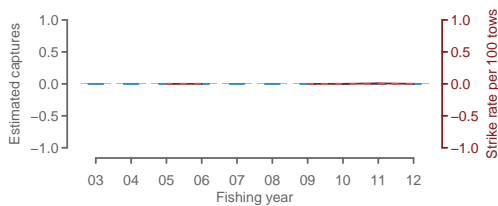
Figure 32: Annual time series of (a) estimated small bird captures, (b) observed Salvin's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.33 Buller's albatross captures, ORH7A challenger

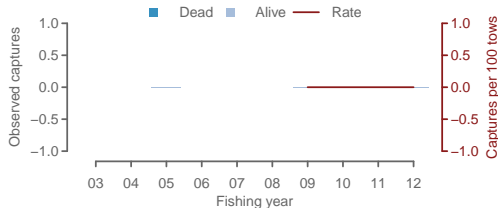
Table 36: Annual trawl effort, observer coverage, observed numbers of Buller's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	2	0			0	0 - 0	0.0	0.0 - 0.0
2003-04	0	-			-			
2004-05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005-06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006-07	0	-			-			
2007-08	0	-			-			
2008-09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009-10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010-11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

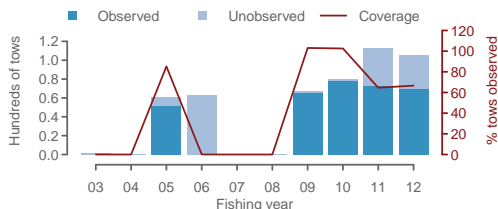
(a) Estimated captures



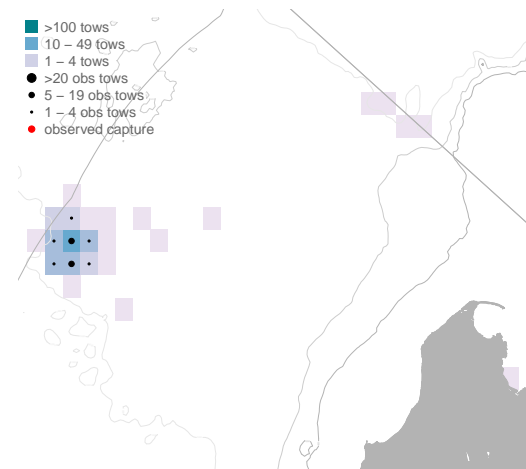
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

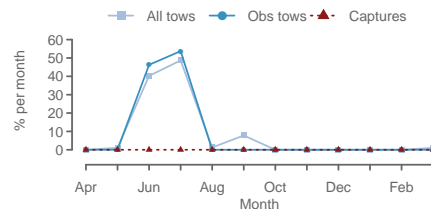


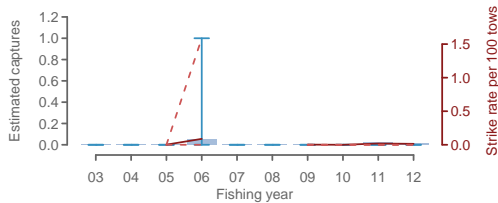
Figure 33: Annual time series of (a) estimated small bird captures, (b) observed Buller's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.34 White-capped albatross captures, ORH7A challenger

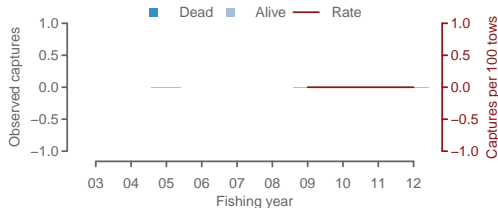
Table 37: Annual trawl effort, observer coverage, observed numbers of white-capped albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.2	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 1	0.1	0.0 - 1.6
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

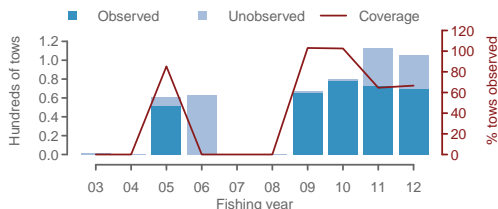
(a) Estimated captures



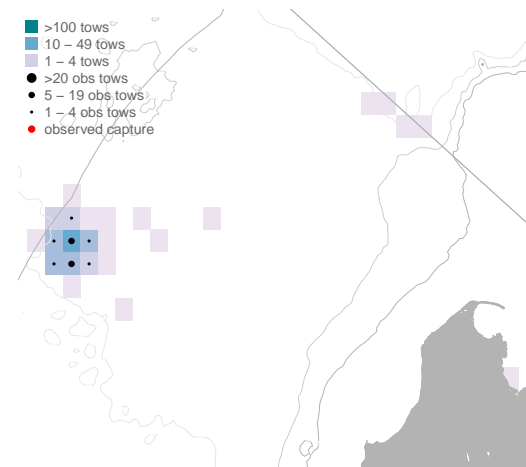
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

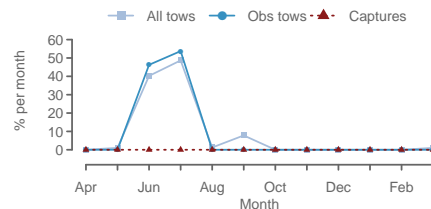


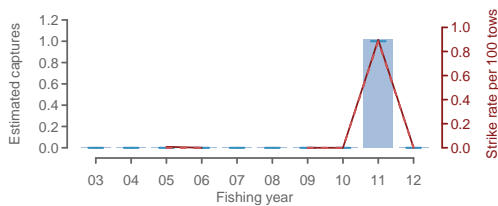
Figure 34: Annual time series of (a) estimated small bird captures, (b) observed white-capped albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.35 Other albatrosses captures, ORH7A challenger

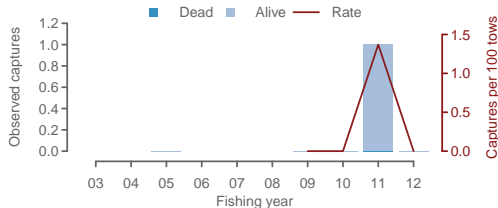
Table 38: Annual trawl effort, observer coverage, observed numbers of other albatrosses captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed		Est. captures		Est. capture rate		
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.1	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	1	1.4	1	1 - 1	0.9	0.9 - 0.9
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

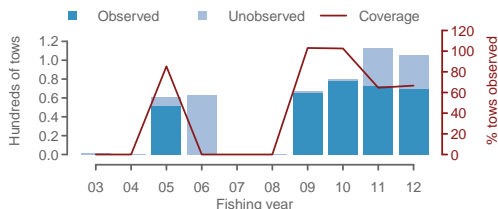
(a) Estimated captures



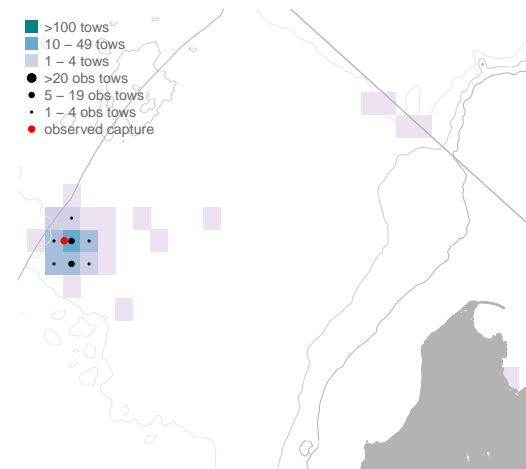
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

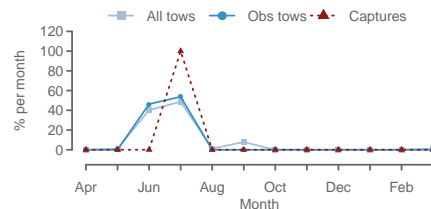


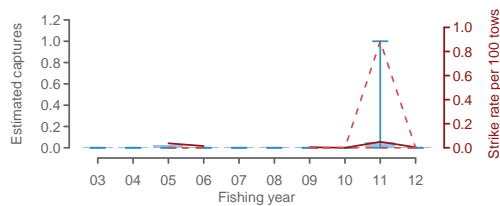
Figure 35: Annual time series of (a) estimated small bird captures, (b) observed other albatrosses captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.36 Small bird captures, ORH7A challenger

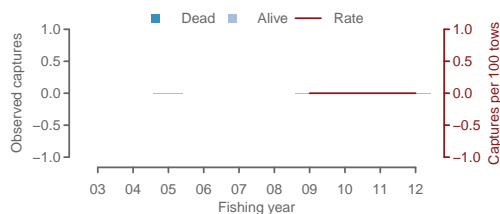
Table 39: Annual trawl effort, observer coverage, observed numbers of small bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed		Est. captures		Est. capture rate		
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.1	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 1	0.0	0.0 - 0.9
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

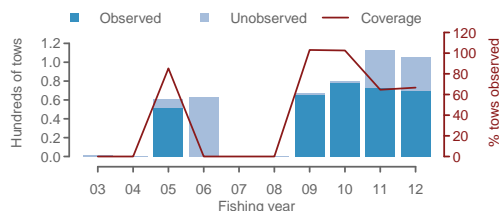
(a) Estimated captures



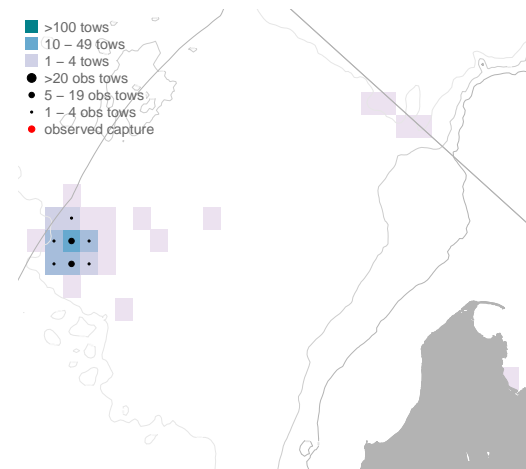
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

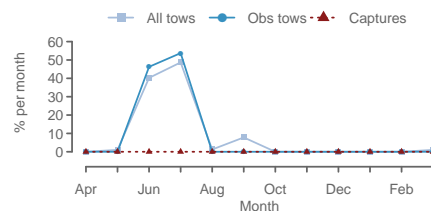


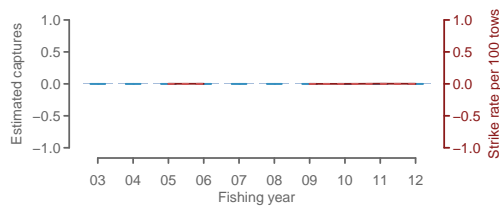
Figure 36: Annual time series of (a) estimated small bird captures, (b) observed small bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.37 Sooty shearwater captures, ORH7A challenger

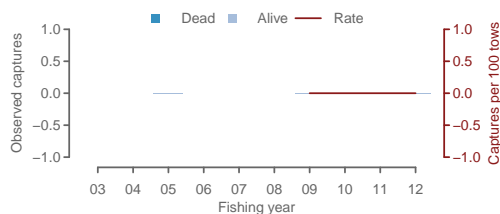
Table 40: Annual trawl effort, observer coverage, observed numbers of sooty shearwater captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.0	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

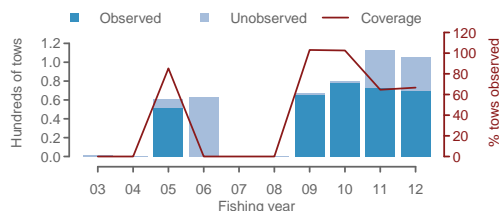
(a) Estimated captures



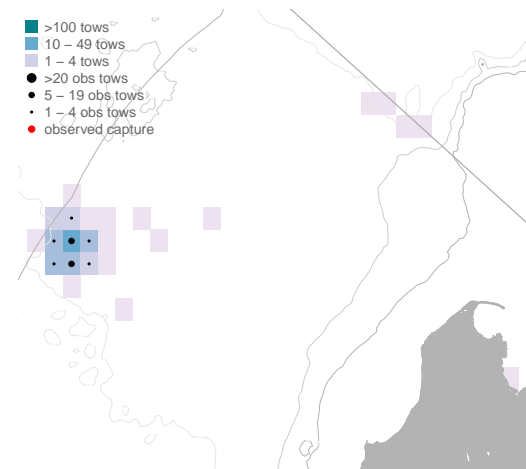
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

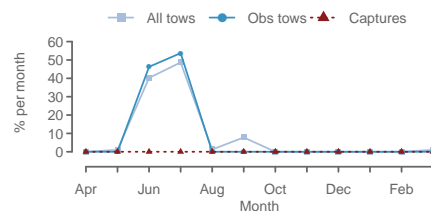


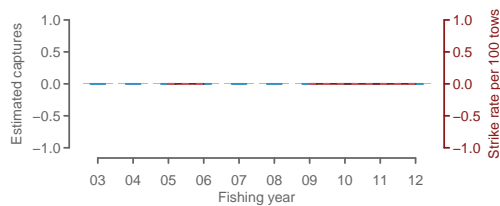
Figure 37: Annual time series of (a) estimated small bird captures, (b) observed sooty shearwater captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.38 White-chinned petrel captures, ORH7A challenger

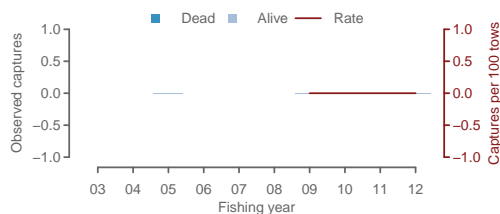
Table 41: Annual trawl effort, observer coverage, observed numbers of white-chinned petrel captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.0	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

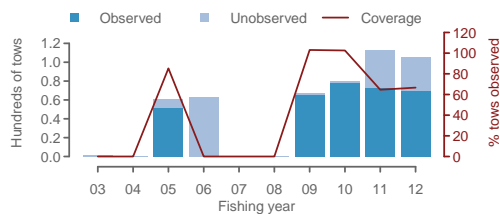
(a) Estimated captures



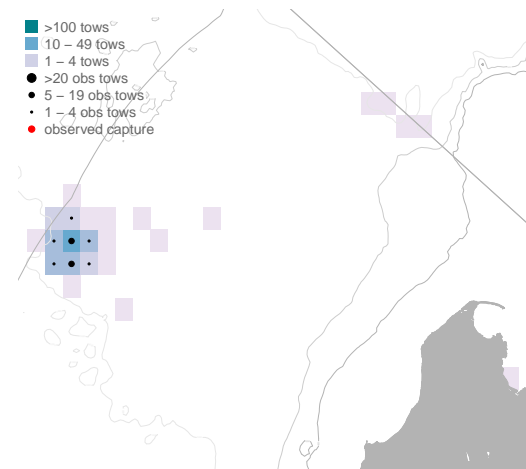
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

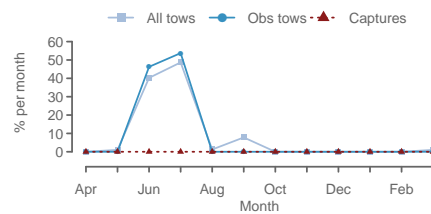


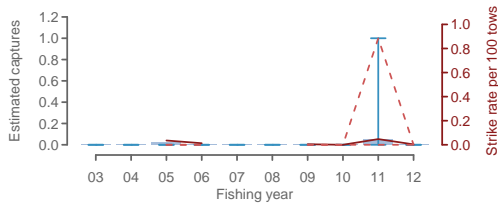
Figure 38: Annual time series of (a) estimated small bird captures, (b) observed white-chinned petrel captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.39 Other birds captures, ORH7A challenger

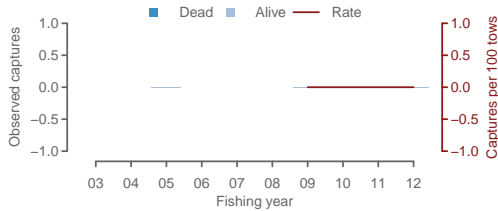
Table 42: Annual trawl effort, observer coverage, observed numbers of other birds captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.1	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 1	0.0	0.0 - 0.9
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

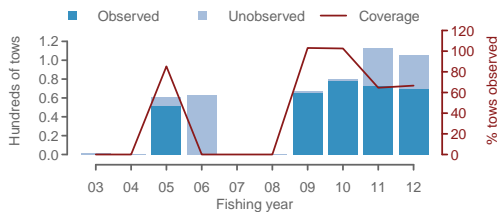
(a) Estimated captures



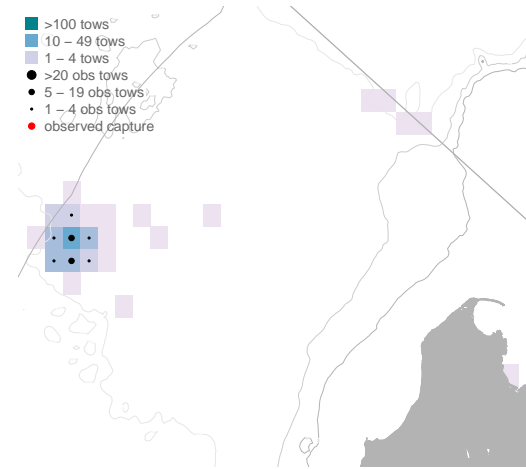
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

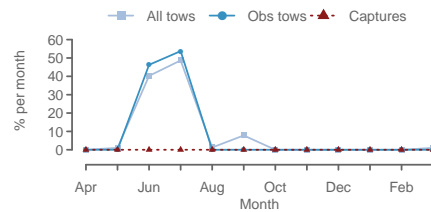


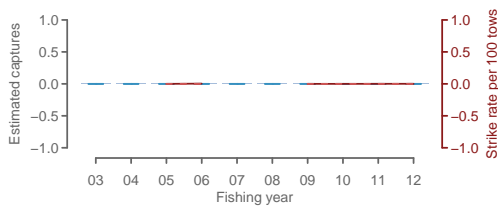
Figure 39: Annual time series of (a) estimated small bird captures, (b) observed other birds captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.40 Fur seal captures, ORH7A challenger

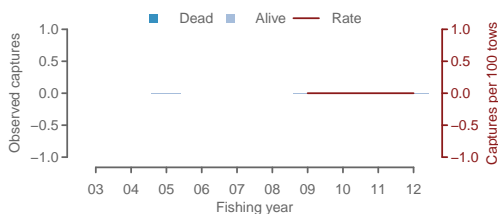
Table 43: Annual trawl effort, observer coverage, observed numbers of fur seal captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in ORH7A challenger.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	2	0			0	0 - 0	0.0	0.0 - 0.0
2003–04	0	-			-			
2004–05	61	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	63	0			0	0 - 0	0.0	0.0 - 0.0
2006–07	0	-			-			
2007–08	0	-			-			
2008–09	65	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	78	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	113	100	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	105	100	0	-	0	0 - 0	0.0	0.0 - 0.0

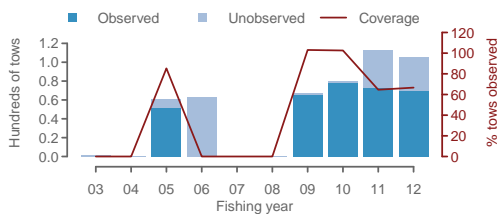
(a) Estimated captures



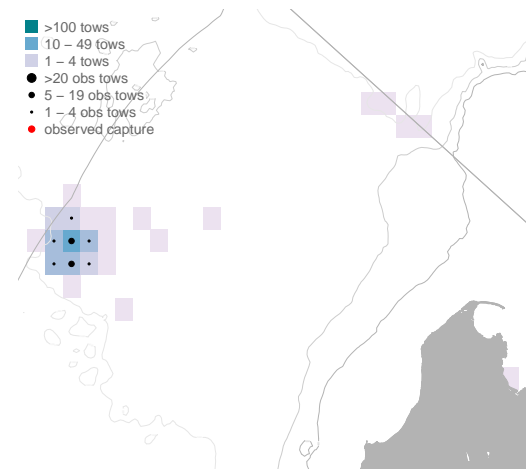
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

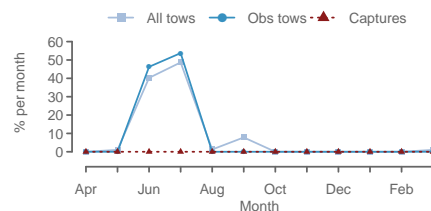


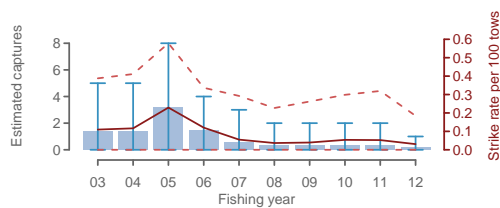
Figure 40: Annual time series of (a) estimated small bird captures, (b) observed fur seal captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in ORH7A challenger. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.41 Large bird captures, Other areas

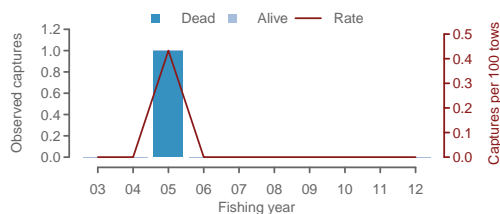
Table 44: Annual trawl effort, observer coverage, observed numbers of large bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	1	0 - 5	0.1	0.0 - 0.4
2003–04	1216	22	0	-	1	0 - 5	0.1	0.0 - 0.4
2004–05	1383	17	1	0.4	3	0 - 8	0.2	0.0 - 0.6
2005–06	1188	33	0	-	1	0 - 4	0.1	0.0 - 0.3
2006–07	1026	65	0	-	1	0 - 3	0.1	0.0 - 0.3
2007–08	882	52	0	-	0	0 - 2	0.0	0.0 - 0.2
2008–09	763	40	0	-	0	0 - 2	0.0	0.0 - 0.3
2009–10	670	30	0	-	0	0 - 2	0.1	0.0 - 0.3
2010–11	626	31	0	-	0	0 - 2	0.1	0.0 - 0.3
2011–12	542	35	0	-	0	0 - 1	0.0	0.0 - 0.2

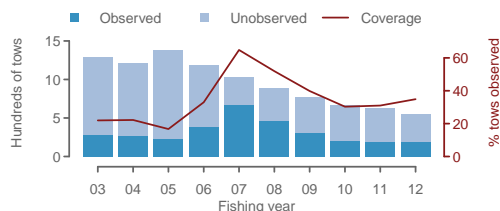
(a) Estimated captures



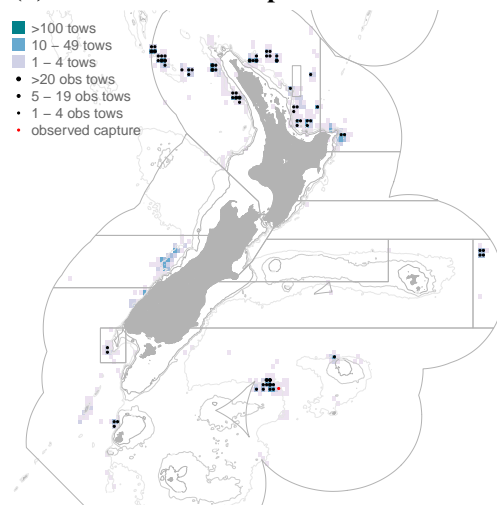
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

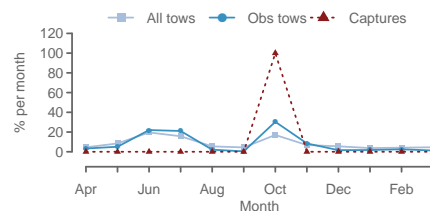


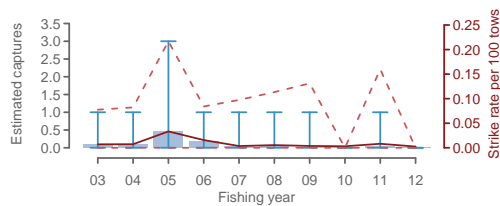
Figure 41: Annual time series of (a) estimated small bird captures, (b) observed large bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.42 Salvin's albatross captures, Other areas

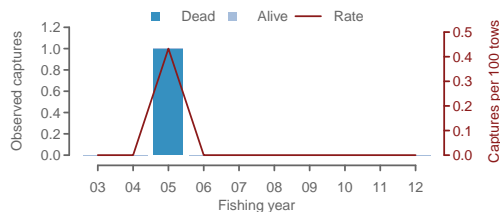
Table 45: Annual trawl effort, observer coverage, observed numbers of Salvin's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2003–04	1216	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2004–05	1383	17	1	0.4	0	0 - 3	0.0	0.0 - 0.2
2005–06	1188	33	0	-	0	0 - 1	0.0	0.0 - 0.1
2006–07	1026	65	0	-	0	0 - 1	0.0	0.0 - 0.1
2007–08	882	52	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	763	40	0	-	0	0 - 1	0.0	0.0 - 0.1
2009–10	670	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	626	31	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	542	35	0	-	0	0 - 0	0.0	0.0 - 0.0

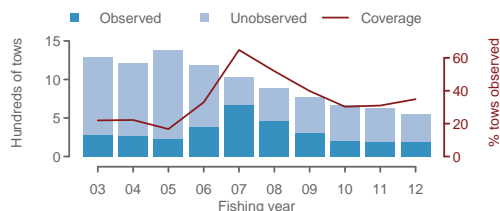
(a) Estimated captures



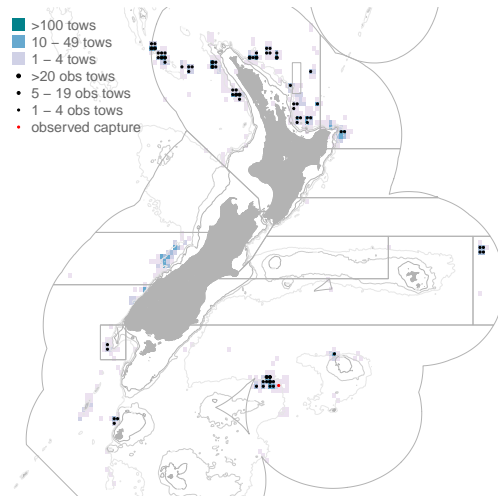
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

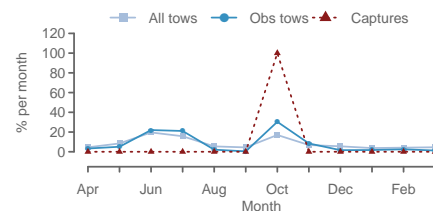


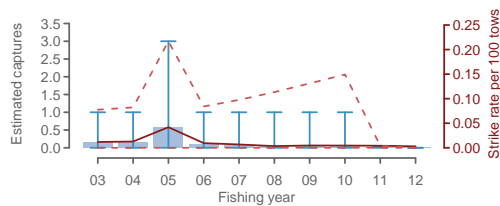
Figure 42: Annual time series of (a) estimated small bird captures, (b) observed Salvin's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.43 Buller's albatross captures, Other areas

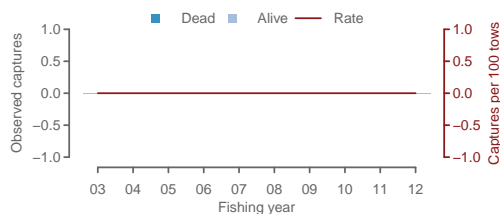
Table 46: Annual trawl effort, observer coverage, observed numbers of Buller's albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002-03	1289	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2003-04	1216	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2004-05	1383	17	0	-	1	0 - 3	0.0	0.0 - 0.2
2005-06	1188	33	0	-	0	0 - 1	0.0	0.0 - 0.1
2006-07	1026	65	0	-	0	0 - 1	0.0	0.0 - 0.1
2007-08	882	52	0	-	0	0 - 1	0.0	0.0 - 0.1
2008-09	763	40	0	-	0	0 - 1	0.0	0.0 - 0.1
2009-10	670	30	0	-	0	0 - 1	0.0	0.0 - 0.1
2010-11	626	31	0	-	0	0 - 0	0.0	0.0 - 0.0
2011-12	542	35	0	-	0	0 - 0	0.0	0.0 - 0.0

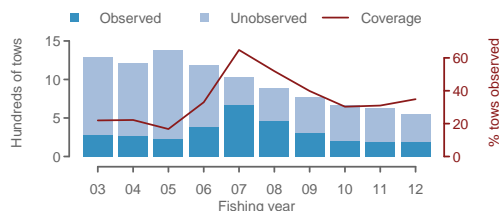
(a) Estimated captures



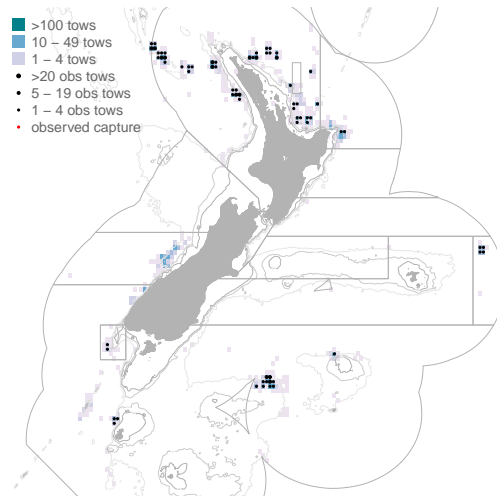
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

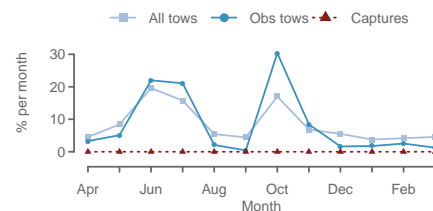


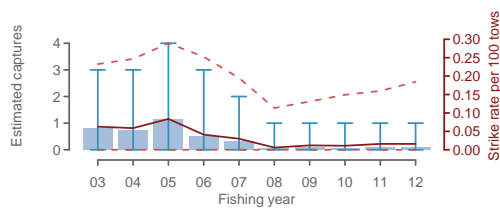
Figure 43: Annual time series of (a) estimated small bird captures, (b) observed Buller's albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002-03 to 2011-12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.44 White-capped albatross captures, Other areas

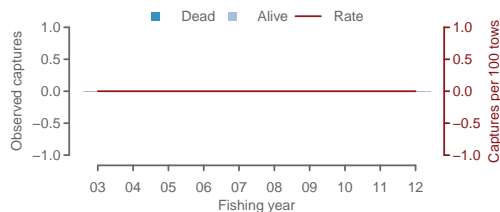
Table 47: Annual trawl effort, observer coverage, observed numbers of white-capped albatross captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	1	0 - 3	0.1	0.0 - 0.2
2003–04	1216	22	0	-	1	0 - 3	0.1	0.0 - 0.2
2004–05	1383	17	0	-	1	0 - 4	0.1	0.0 - 0.3
2005–06	1188	33	0	-	0	0 - 3	0.0	0.0 - 0.3
2006–07	1026	65	0	-	0	0 - 2	0.0	0.0 - 0.2
2007–08	882	52	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	763	40	0	-	0	0 - 1	0.0	0.0 - 0.1
2009–10	670	30	0	-	0	0 - 1	0.0	0.0 - 0.1
2010–11	626	31	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	542	35	0	-	0	0 - 1	0.0	0.0 - 0.2

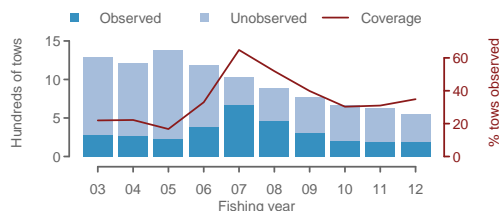
(a) Estimated captures



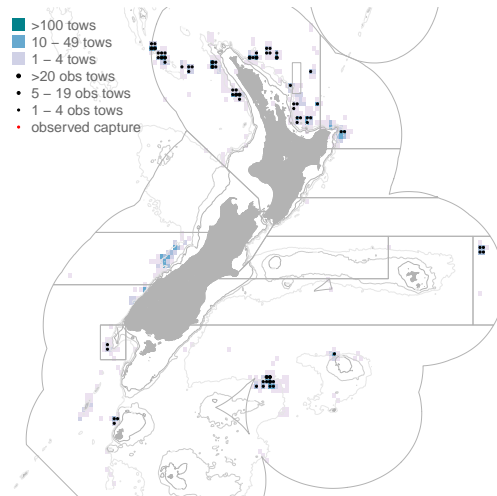
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

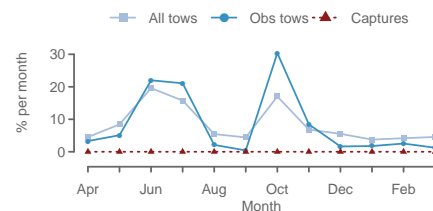


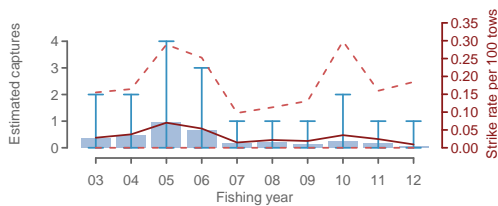
Figure 44: Annual time series of (a) estimated small bird captures, (b) observed white-capped albatross captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.45 Other albatrosses captures, Other areas

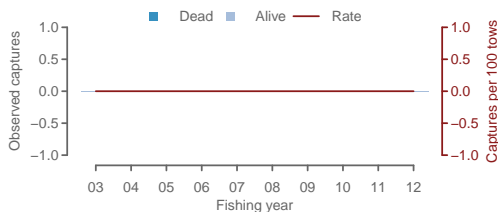
Table 48: Annual trawl effort, observer coverage, observed numbers of other albatrosses captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	0	0 - 2	0.0	0.0 - 0.2
2003–04	1216	22	0	-	0	0 - 2	0.0	0.0 - 0.2
2004–05	1383	17	0	-	1	0 - 4	0.1	0.0 - 0.3
2005–06	1188	33	0	-	1	0 - 3	0.1	0.0 - 0.3
2006–07	1026	65	0	-	0	0 - 1	0.0	0.0 - 0.1
2007–08	882	52	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	763	40	0	-	0	0 - 1	0.0	0.0 - 0.1
2009–10	670	30	0	-	0	0 - 2	0.0	0.0 - 0.3
2010–11	626	31	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	542	35	0	-	0	0 - 1	0.0	0.0 - 0.2

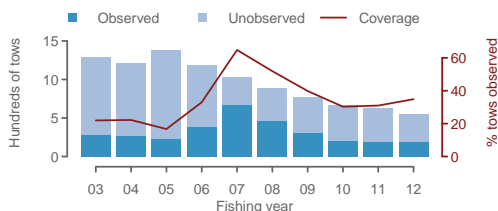
(a) Estimated captures



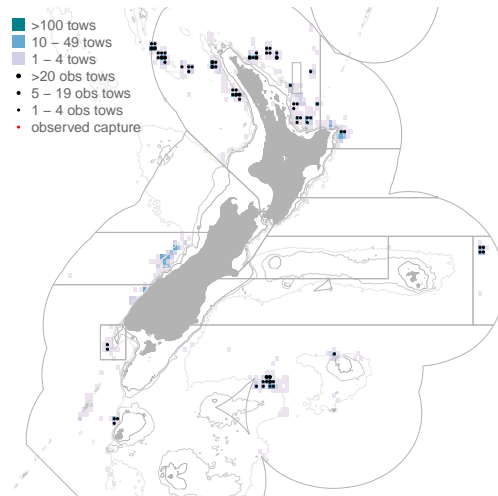
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

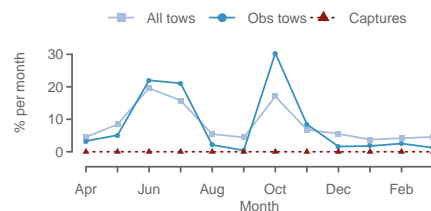


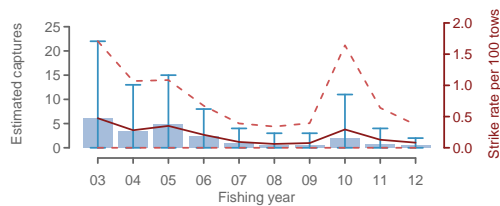
Figure 45: Annual time series of (a) estimated small bird captures, (b) observed other albatrosses captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.46 Small bird captures, Other areas

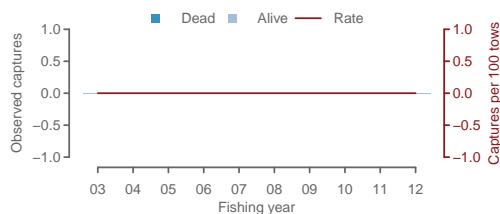
Table 49: Annual trawl effort, observer coverage, observed numbers of small bird captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	6	0 - 22	0.5	0.0 - 1.7
2003–04	1216	22	0	-	3	0 - 13	0.3	0.0 - 1.1
2004–05	1383	17	0	-	5	0 - 15	0.4	0.0 - 1.1
2005–06	1188	33	0	-	2	0 - 8	0.2	0.0 - 0.7
2006–07	1026	65	0	-	1	0 - 4	0.1	0.0 - 0.4
2007–08	882	52	0	-	1	0 - 3	0.1	0.0 - 0.3
2008–09	763	40	0	-	1	0 - 3	0.1	0.0 - 0.4
2009–10	670	30	0	-	2	0 - 11	0.3	0.0 - 1.6
2010–11	626	31	0	-	1	0 - 4	0.1	0.0 - 0.6
2011–12	542	35	0	-	0	0 - 2	0.1	0.0 - 0.4

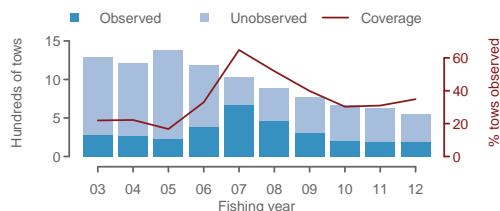
(a) Estimated captures



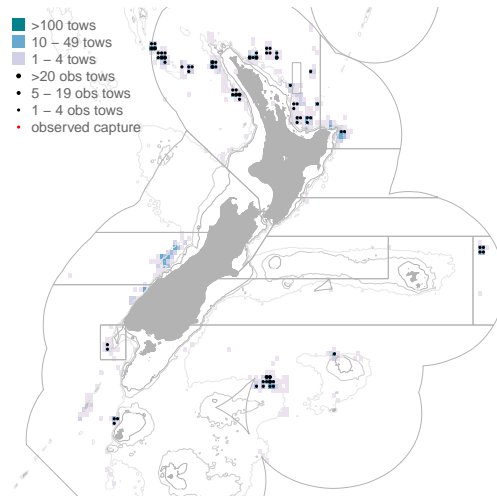
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

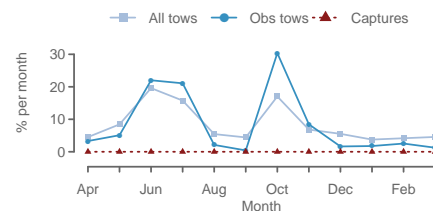


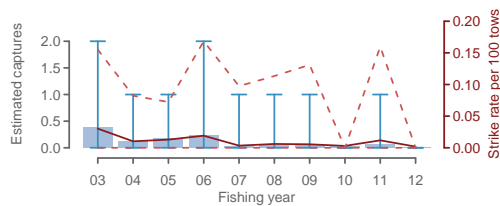
Figure 46: Annual time series of (a) estimated small bird captures, (b) observed small bird captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.47 Sooty shearwater captures, Other areas

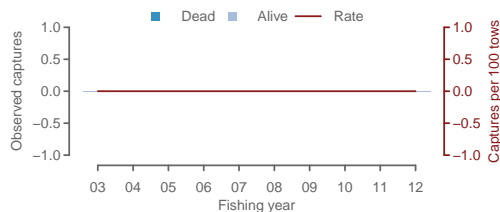
Table 50: Annual trawl effort, observer coverage, observed numbers of sooty shearwater captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	0	0 - 2	0.0	0.0 - 0.2
2003–04	1216	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2004–05	1383	17	0	-	0	0 - 1	0.0	0.0 - 0.1
2005–06	1188	33	0	-	0	0 - 2	0.0	0.0 - 0.2
2006–07	1026	65	0	-	0	0 - 1	0.0	0.0 - 0.1
2007–08	882	52	0	-	0	0 - 1	0.0	0.0 - 0.1
2008–09	763	40	0	-	0	0 - 1	0.0	0.0 - 0.1
2009–10	670	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	626	31	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	542	35	0	-	0	0 - 0	0.0	0.0 - 0.0

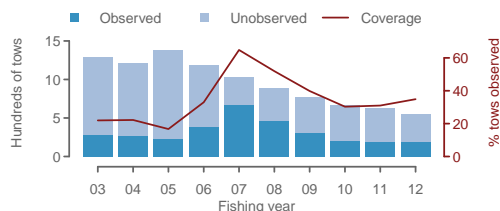
(a) Estimated captures



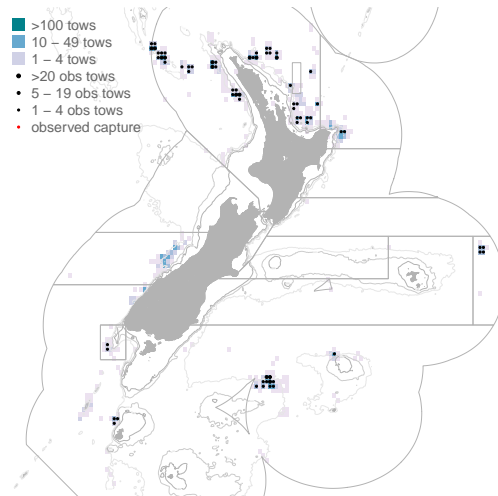
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

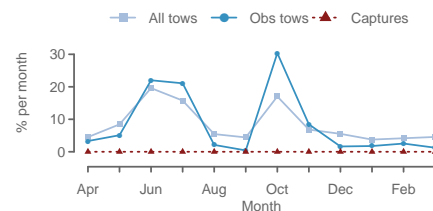


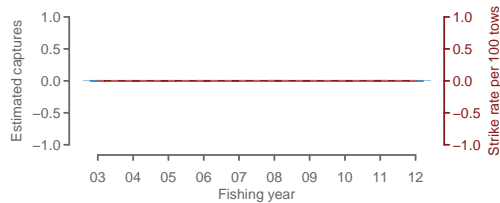
Figure 47: Annual time series of (a) estimated small bird captures, (b) observed sooty shearwater captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.48 White-chinned petrel captures, Other areas

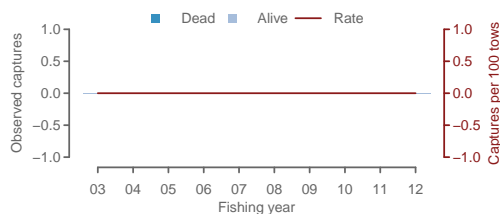
Table 51: Annual trawl effort, observer coverage, observed numbers of white-chinned petrel captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	0	0 - 0	0.0	0.0 - 0.0
2003–04	1216	22	0	-	0	0 - 0	0.0	0.0 - 0.0
2004–05	1383	17	0	-	0	0 - 0	0.0	0.0 - 0.0
2005–06	1188	33	0	-	0	0 - 0	0.0	0.0 - 0.0
2006–07	1026	65	0	-	0	0 - 0	0.0	0.0 - 0.0
2007–08	882	52	0	-	0	0 - 0	0.0	0.0 - 0.0
2008–09	763	40	0	-	0	0 - 0	0.0	0.0 - 0.0
2009–10	670	30	0	-	0	0 - 0	0.0	0.0 - 0.0
2010–11	626	31	0	-	0	0 - 0	0.0	0.0 - 0.0
2011–12	542	35	0	-	0	0 - 0	0.0	0.0 - 0.0

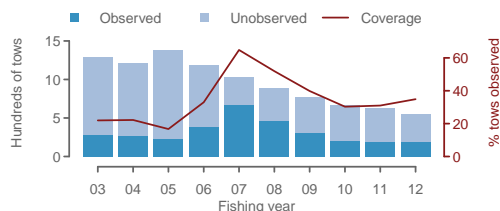
(a) Estimated captures



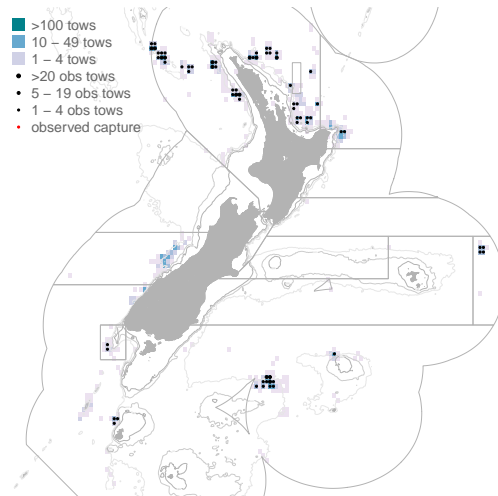
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

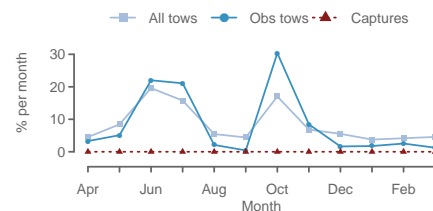


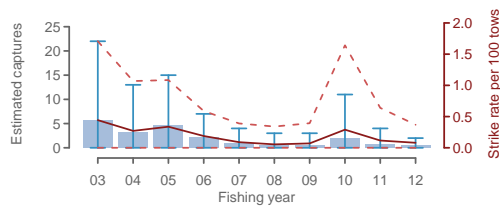
Figure 48: Annual time series of (a) estimated small bird captures, (b) observed white-chinned petrel captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.49 Other birds captures, Other areas

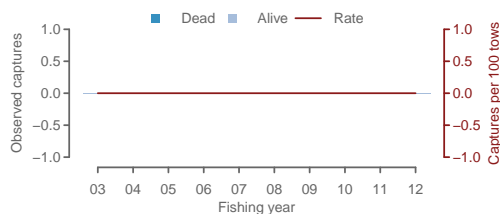
Table 52: Annual trawl effort, observer coverage, observed numbers of other birds captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed			Est. captures		Est. capture rate	
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	6	0 - 22	0.4	0.0 - 1.7
2003–04	1216	22	0	-	3	0 - 13	0.3	0.0 - 1.1
2004–05	1383	17	0	-	5	0 - 15	0.3	0.0 - 1.1
2005–06	1188	33	0	-	2	0 - 7	0.2	0.0 - 0.6
2006–07	1026	65	0	-	1	0 - 4	0.1	0.0 - 0.4
2007–08	882	52	0	-	0	0 - 3	0.1	0.0 - 0.3
2008–09	763	40	0	-	1	0 - 3	0.1	0.0 - 0.4
2009–10	670	30	0	-	2	0 - 11	0.3	0.0 - 1.6
2010–11	626	31	0	-	1	0 - 4	0.1	0.0 - 0.6
2011–12	542	35	0	-	0	0 - 2	0.1	0.0 - 0.4

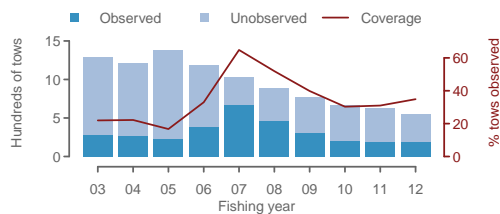
(a) Estimated captures



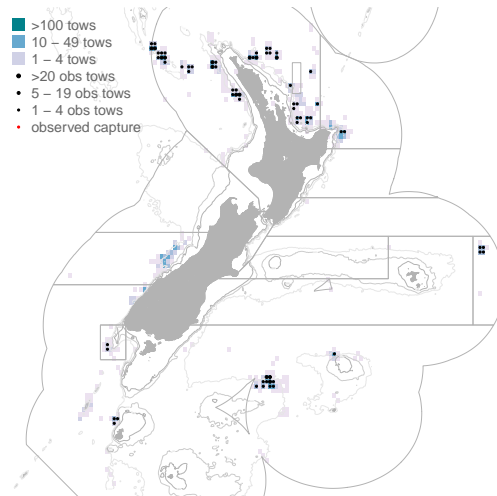
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

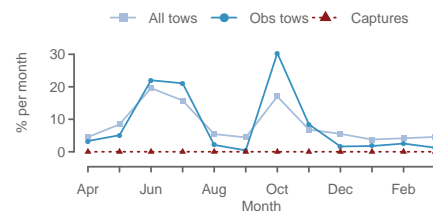


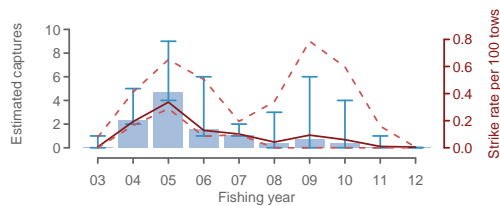
Figure 49: Annual time series of (a) estimated small bird captures, (b) observed other birds captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

2.50 Fur seal captures, Other areas

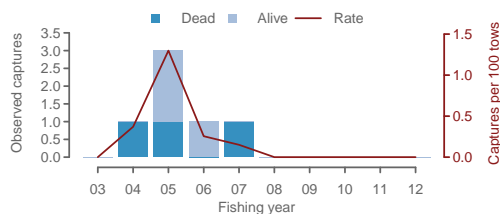
Table 53: Annual trawl effort, observer coverage, observed numbers of fur seal captured, observed capture rate (birds per 100 trawls), estimated fur seal captures, interactions, and the estimated strike rate (with 95% confidence intervals), in the orange roughy trawl fishery, in Other areas.

	Effort	Observed		Est. captures		Est. capture rate		
		% obs.	Capt.	Rate	Mean	95% c.i.	Mean	95% c.i.
2002–03	1289	22	0	-	0	0 - 1	0.0	0.0 - 0.1
2003–04	1216	22	1	0.4	2	2 - 5	0.2	0.2 - 0.4
2004–05	1383	17	3	1.3	5	4 - 9	0.3	0.3 - 0.7
2005–06	1188	33	1	0.3	2	1 - 6	0.1	0.1 - 0.5
2006–07	1026	65	1	0.2	1	1 - 2	0.1	0.1 - 0.2
2007–08	882	52	0	-	0	0 - 3	0.0	0.0 - 0.3
2008–09	763	40	0	-	1	0 - 6	0.1	0.0 - 0.8
2009–10	670	30	0	-	0	0 - 4	0.1	0.0 - 0.6
2010–11	626	31	0	-	0	0 - 1	0.0	0.0 - 0.2
2011–12	542	35	0	-	0	0 - 0	0.0	0.0 - 0.0

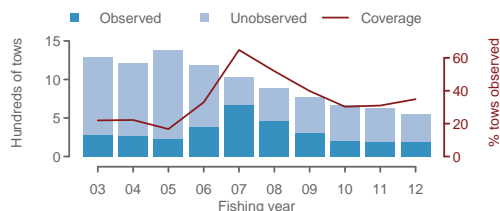
(a) Estimated captures



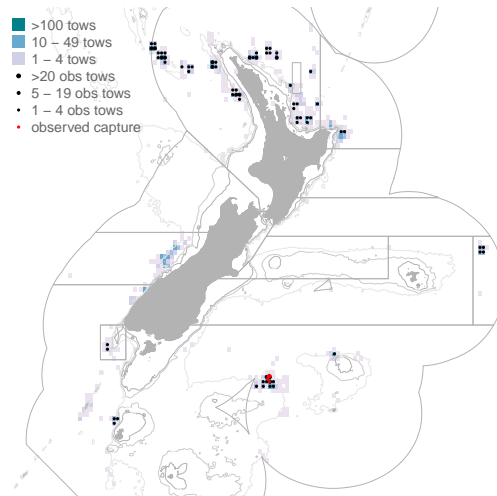
(b) Observed captures



(c) Effort, and observer coverage



(d) October 2003 to September 2012



(e) Monthly distribution

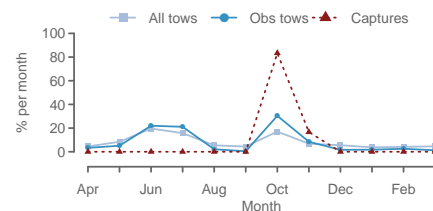


Figure 50: Annual time series of (a) estimated small bird captures, (b) observed fur seal captures and the capture rate, and (c) trawl effort and observer coverage, in the orange roughy trawl fishery from 2002–03 to 2011–12 in Other areas. In map (d) average effort is plotted in a blue colour scale, observer coverage is indicated with black dots, and observed captures with red dots. Plot (e) shows mean monthly distribution of total effort, observed effort and observed captures.

3. ACKNOWLEDGMENTS

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