Estimates of Seabird Bycatch in Alaskan Groundfish Fisheries Using the Alaska Region Catch Accounting System, 2007-2011

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Methods

NOAA's Alaska Fisheries Science Center (AFSC) fisheries observers have been recording seabird bycatch information in detail since 1993. Annual estimates of total seabird bycatch in Alaskan groundfish fisheries has provided valuable information for conservation and management. In 2009 the Alaska Fisheries Science Center held a workshop to address rare-event fisheries bycatch issues. A recommendation was made that seabird bycatch estimates be generated using the Alaska Region Catch Accounting System (CAS). Results from the CAS match well with previous methods used since 1993 (Fig. 1) and has now CAS been adopted as the standard tool for generation of estimates (see tables). With this system we can report seabird bycatch estimates for species or species groups by statistical area, region, target fishery, and time period.

Longline

Based on the CAS estimates, groundfish longline fisheries account for most of the bycatch. Depending on the year, fulmars, shearwaters, and gulls are the most common species taken. Albatross bycatch is an important conservation concern, including especially the endangered Short-tailed albatross.

Table 1. Summary of estimated seabird bycatch in the Alaskan demersal longline groundfish fishery, all Fishery Management Plan areas combined.

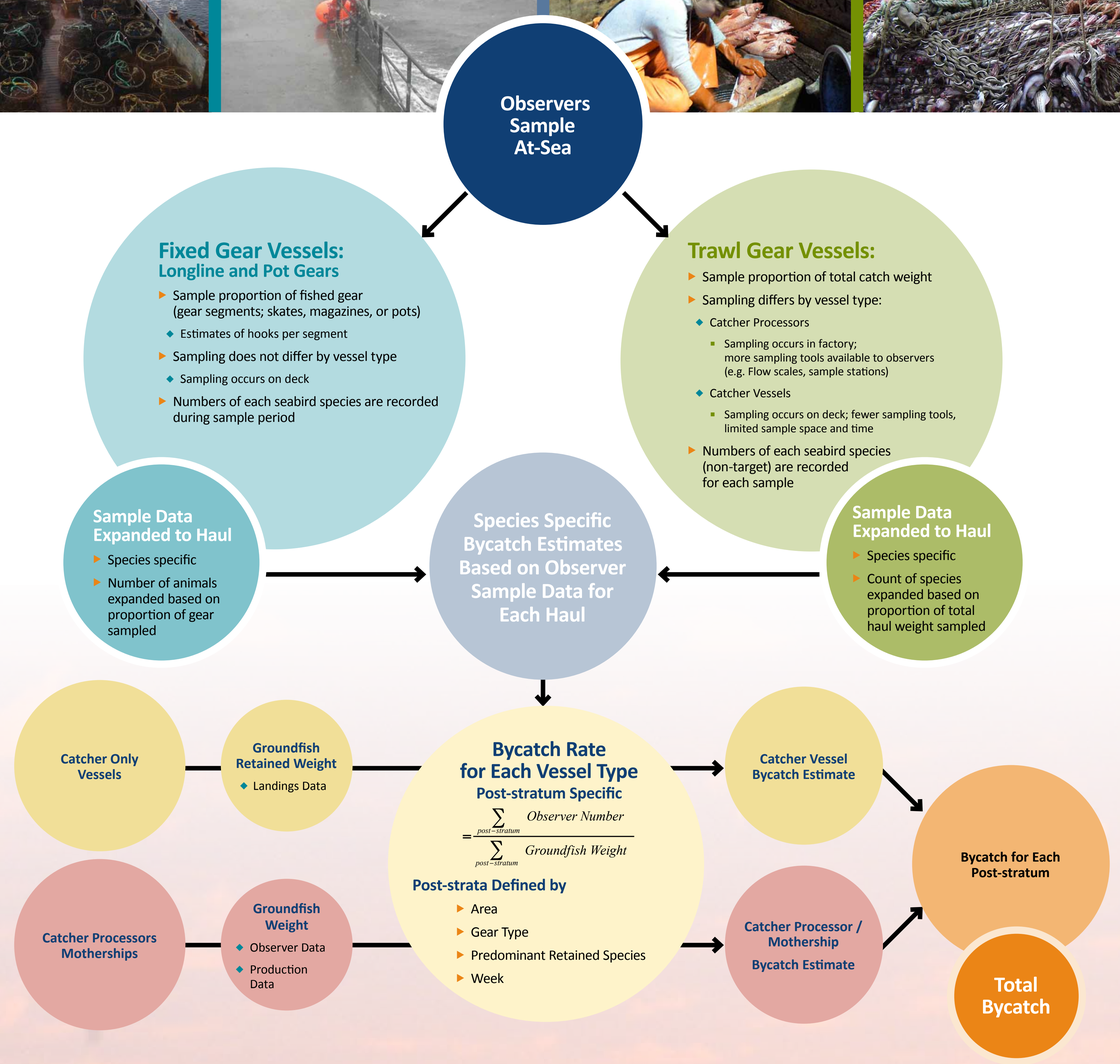
Species/ Species Group	Year				
	2007	2008	2009	2010	2011
Unidentified Albatross	16	0	0	0	0
Short-tailed Albatross	0	0	0	15	5
Laysan Albatross	17	420	105	267	189
Black-footed Albatross	176	290	52	44	206
Northern Fulmar	3,556	2,860	7,161	1,782	5,848
Shearwater	2,876	1,201	576	492	195
Storm Petrel	0	0	0	0	0
Gull	1,006	1,403	1,214	1,084	2,206
Kittiwake	10	0	10	0	6
Murre	5	5	13	0	0
Puffin	0	0	0	5	0
Auklet	0	0	0	0	0
Other Alcid	0	0	0	0	0
Other Bird	0	0	0	0	0
Unidentified	493	40	122	15	259
Total	8,155	6,219	9,253	3,704	8,914

All Birds Combined

During the 2007-2011 reporting period, estimates of total bycatch have ranged from 4,596 to 10,441 birds. Albatross bycatch exhibits inter-annual variability in the total numbers and relative take by species. In 2007 and 2011 Black-footed Albatross (*Phoebastria nigripes*) was higher than Laysan Albatross (*Phoebastria immutabilis*) while Laysan Albatross bycatch was higher in other years. Total estimated take for Short-tailed albatross (*Phoebastria albatrus*) was 20 (15 in 2010 and 5 in 2011). The most common species taken was Northern Fulmar (*Fulmaris glacialis*), averaging > 50% of the bycatch (from 2,357 to 6,214 birds).

Table 2. Total estimated seabird bycatch in Alaskan federal groundfish fisheries, all gear types and Fishery Management Plan areas combined, 2007 through 2011.

Species/ Species Group	Year				
	2007	2008	2009	2010	2011
Unidentified Albatross	16	0	0	0	0
Short-tailed Albatross	0	0	0	15	5
Laysan Albatross	17	420	114	267	189
Black-footed Albatross	176	290	52	44	206
Northern Fulmar	4,581	3,426	7,921	2,357	6,214
Shearwater	3,602	1,214	622	647	199
Storm Petrel	1	44	0	0	0
Gull	1,309	1,472	1,296	1,141	2,208
Kittiwake	10	0	16	0	6
Murre	7	5	13	102	14
Puffin	0	0	0	5	0
Auklet	0	3	0	0	0
Other Alcid	0	0	105	0	0
Other Bird	0	0	136	0	0
Unidentified	509	40	166	18	259
Total	10,228	6,914	10,441	4,596	9,298



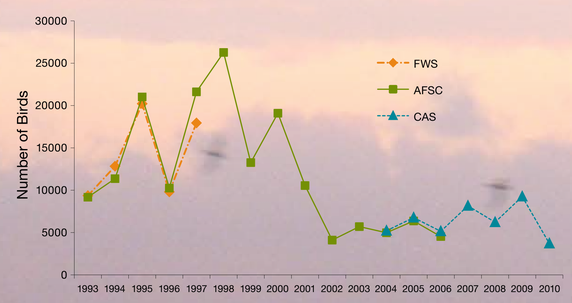


Figure 1. Comparison of three analytical methods to produce estimates of total seabird bycatch in the Alaskan groundfish longline fisheries.

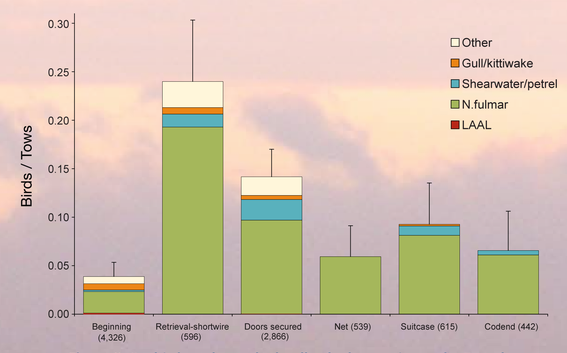


Figure 2. Seabird catch rate by haulback observation code. Error bar indicates 95% CI on total.

Trawl

Trawl fisheries generally have much lower bycatch numbers and most bycatch from observer samples are fulmars and shearwaters. Very few albatross are taken and only Laysan albatross have been recorded taken on trawl vessels.

However, on trawlers the total mortality of birds is difficult to estimate due to interaction with fishing gear outside of that included in the observer sample-based estimate (Fig. 2).

Table 3. Estimated seabird bycatch for Alaskan groundfish trawl fisheries, pelagic and non-pelagic gear combined, all Fishery Management Plan areas combined.

Species/ Species Group	Year				
	2007	2008	2009	2010	2011
Unidentified Albatross	0	0	0	0	0
Short-tailed Albatross	0	0	0	0	0
Laysan Albatross	0	0	9	0	0
Black-footed Albatross	0	0	0	0	0
Northern Fulmar	653	537	635	506	330
Shearwater	726	13	41	155	3
Storm Petrel	1	44	0	0	0
Gull	303	9	82	57	1
Kittiwake	0	0	6	0	0
Murre	2	0	0	102	14
Puffin	0	0	0	0	0
Auklet	0	3	0	0	0
Other Alcid	0	0	105	0	0
Other Bird	0	0	136	0	0
Unidentified	16	0	44	3	0
Total	1,701	606	1,058	823	348

Fishery Specific for 2011

The CAS provides estimates by target species so we can report total estimated seabird bycatch by fishery. In 2011, the cod freezer longline fishery had the highest total bycatch while the sablefish fishery operating in the Gulf of Alaska tends to have higher albatross numbers.

Table 4. Estimated seabird bycatch in Alaska by groundfish fishery target in 2011.

Fishery					
Region	Gear	Target	Total	Species	Number
BSAI	Longline	Greenland Turbot	534	Laysan Albatross	5
				Northern Fulmar	491
				Shearwaters	38
BSAI	Longline	Pacific Cod	6,649	Short-tailed Albatross	5
				Laysan Albatross	28
				Northern Fulmar	4,583
				Shearwaters	126
				Kittiwake	6
				Gull	1,643
				Unidentified bird	259
BSAI	Longline	Sablefish	78	Black-footed Albatross	7
				Laysan Albatross	9
				Northern Fulmar	36
				Shearwaters	8
				Gulls	19
BSAI	Trawl	Atka Mackerel	29	Northern Fulmar	29
BSAI	Trawl	Flatfish	59	Northern Fulmar	59
BSAI	Trawl	Pacific Cod	0	None	0
BSAI	Trawl	Pacific Ocean Perch	0	None	0
BSAI	Trawl	Pollock	233	Northern Fulmar	215
				Shearwaters	3
				Gulls	1
				Murres	14
BSAI	Trawl	Sablefish	0	None	0
BSAI	Pot	Sablefish	0	None	0
BSAI	Pot	Pacific Cod	0	None	0
GOA	Longline	Pacific Cod	43	Northern Fulmar	7
				Gulls	35
GOA	Longline	Sablefish	1,609	Black-footed Albatross	200
				Laysan Albatross	147
				Northern Fulmar	730
				Shearwaters	23
				Gulls	509
GOA	Trawl	Flatfish	0	None	0
GOA	Trawl	Pacific Cod	0	None	0
GOA	Trawl	Rockfish	27	Northern Fulmar	27
GOA	Trawl	Sablefish	0	None	0
GOA	Pot	Pacific Cod	37	None	37

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References

Cahalan, J.A., J. Mondragon, J. Gasper. 2010. Catch Sampling and Estimation in the Federal Groundfish Fisheries off Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-205, 42 p.

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