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Alaska Region

# Alaska Groundfish and Halibut Seabird Working Group

## Seabird Bycatch in Alaska

Presented by Anne Marie Eich and Liz Labunski (USFWS)

April 2018

# Outline

- 2010 – 2017 Seabird Bycatch Estimates
  - Hook-and-line
  - Trawl
  - Pot
- Alaska Groundfish and Halibut Seabird Working Group



# Albatross Species in Alaska

- Laysan Albatross



- Black-footed Albatross

- Short-tailed Albatross



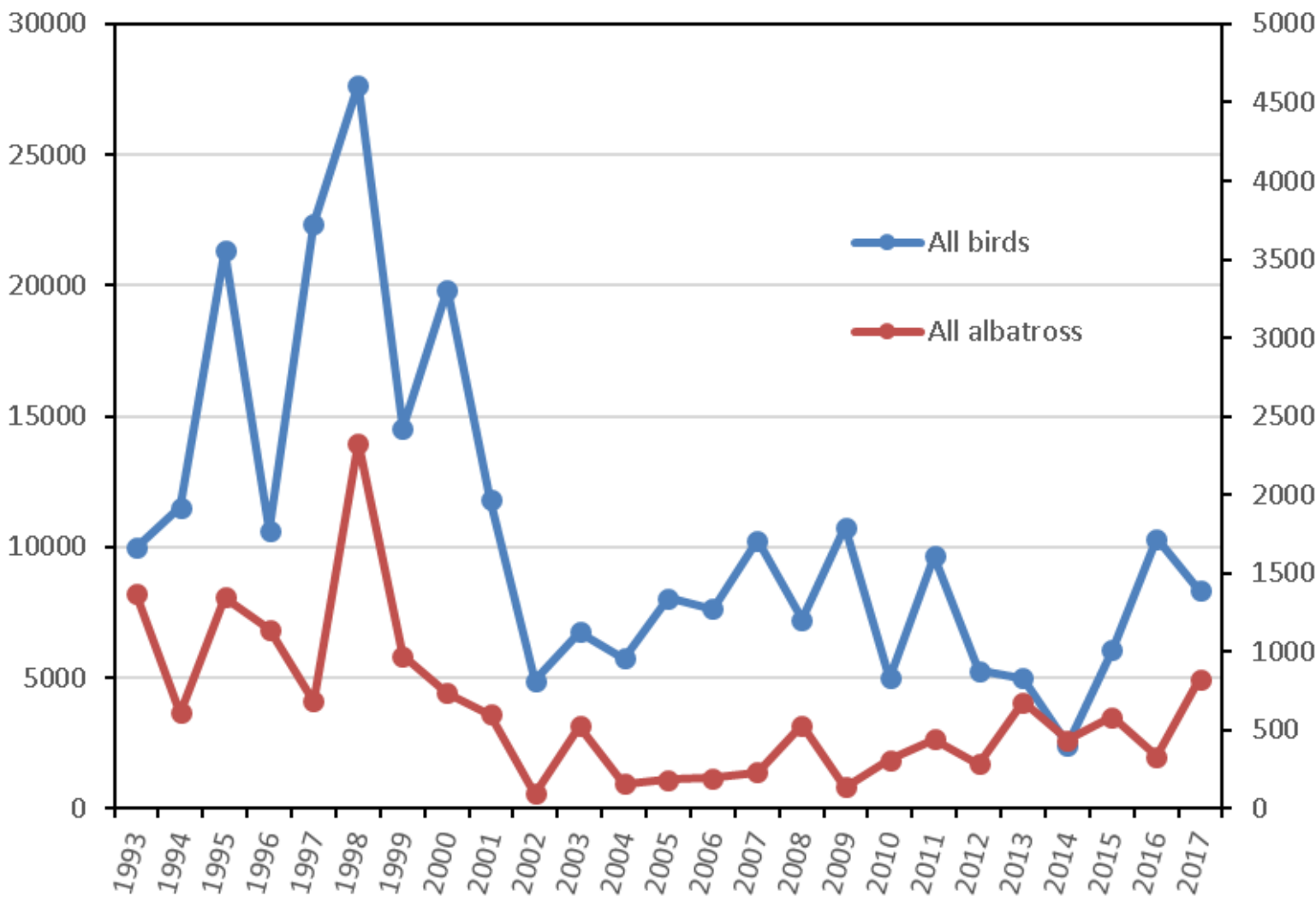
Photo credits: Rob Suryan, Oregon State University

# Seabirds

- Attracted to offal discharge
- Most vulnerable to gear interactions during gear deployment
- Deterred by streamer lines

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# Acknowledgements

- NOAA Fisheries North Pacific Observer Program, especially the observers who collect data on bycatch of marine species, including seabirds.
- The Alaska Fisheries Science Center, U.S. Fish and Wildlife Service, Washington Sea Grant, and other researchers for their seabird and fisheries bycatch work that has led to lower numbers of seabird bycatch on Alaska fishing grounds.
- Thank you to the fishermen, fishing communities, and fishing industry for their continued dedication to minimizing interactions between commercial fisheries and seabirds.

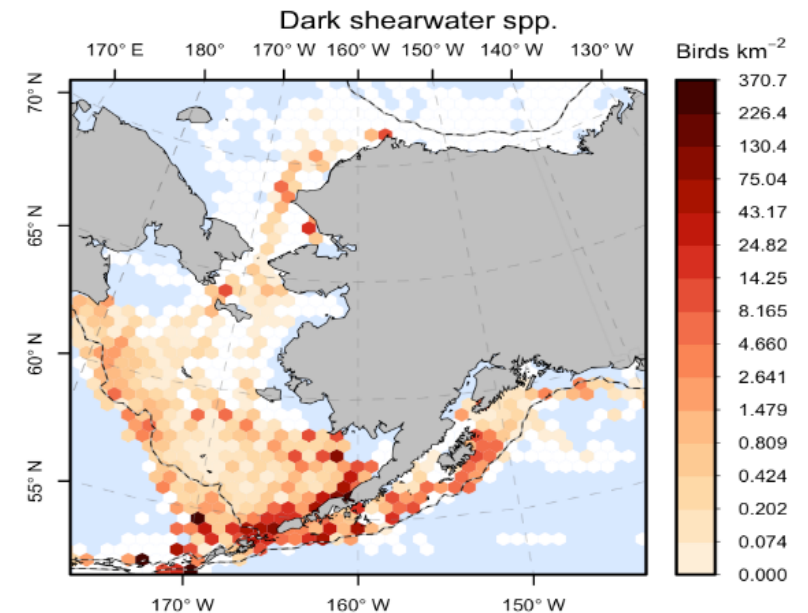
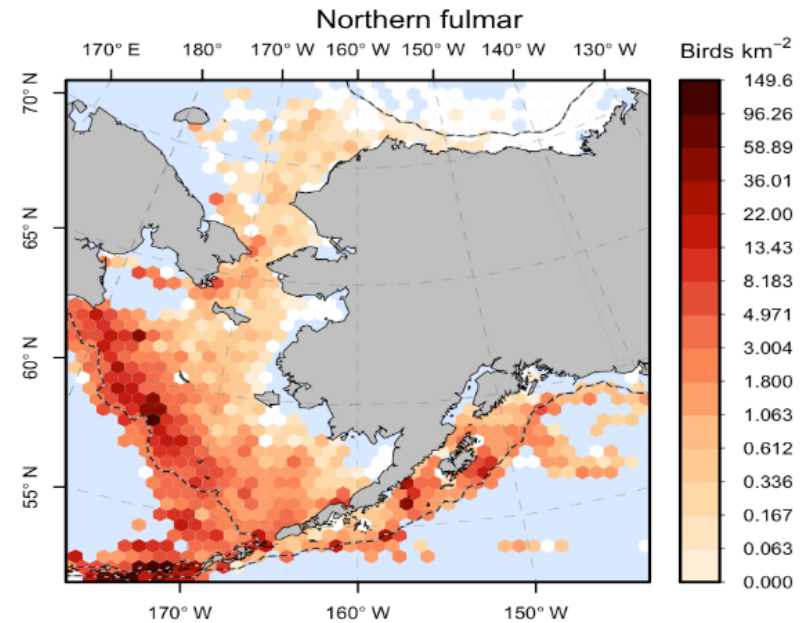
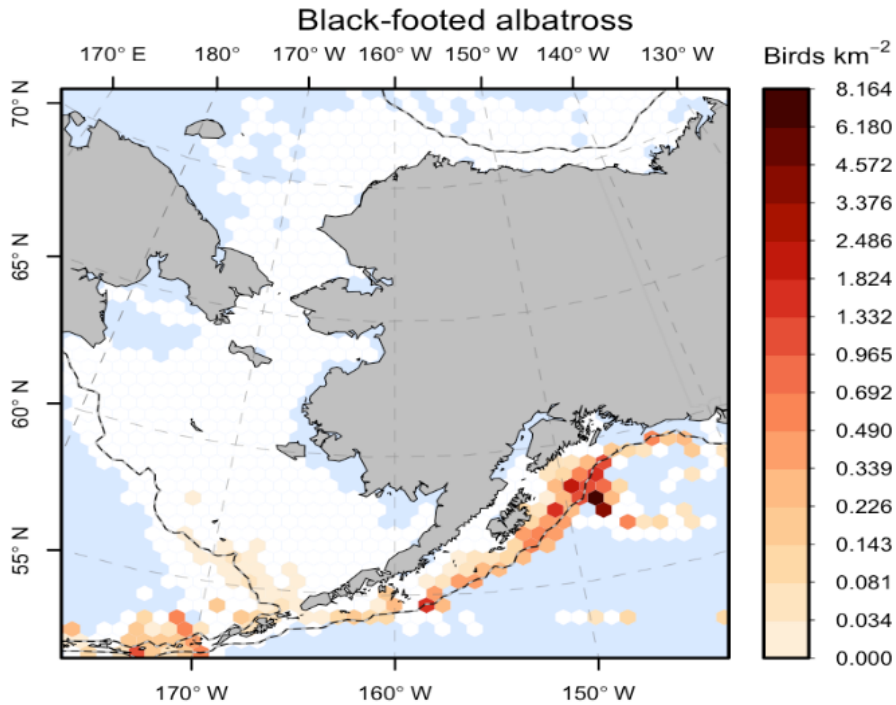
# Seabird Bycatch Estimates

- Groundfish fisheries 2010 - 2017
- Halibut fisheries 2013 - 2017 only
- Hook-and-line, trawl, and pot gear
- BSAI and GOA

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
<b>Unidentified Albatrosses</b>	0	10	0	28	33	0	0	0	9
<b>Short-tailed Albatross</b>	15	5	0	0	9	0	0	0	4
<b>Laysan Albatross</b>	222	205	141	201	99	216	131	38	157
<b>Black-footed Albatross</b>	71	222	141	449	278	363	198	787	314
<b>Northern Fulmar</b>	2,474	6,331	3,148	3,177	815	3,545	5,457	4,334	3,660
<b>Shearwaters</b>	657	262	585	253	186	382	3,365	2,080	971
<b>Gulls</b>	1,173	2,227	898	575	730	1,247	751	679	1,035
<b>Kittiwakes</b>	0	6	5	3	4	12	6	23	7
<b>Murres</b>	102	14	6	3	47	0	58	11	30
<b>Puffins</b>	9	0	0	0	0	0	11	0	3
<b>Auklets</b>	0	0	7	4	107	69	29	36	32
<b>Other Alcids</b>	0	0	0	0	39	0	0	0	5
<b>Cormorants</b>	0	0	0	0	0	31	0	0	4
<b>Other Birds</b>	0	0	0	0	0	0	0	63	8
<b>Unidentified Birds</b>	270	387	343	292	77	190	302	272	267
<b>Grand Total</b>	<b>4,994</b>	<b>9,668</b>	<b>5,274</b>	<b>4,986</b>	<b>2,424</b>	<b>6,056</b>	<b>10,309</b>	<b>8,322</b>	<b>6,504</b>



# Seabird Distribution



The maps are from at-sea surveys by USFWS (Kuletz, PI), 2007-2015, all months combined. Density of birds (birds/km<sup>2</sup>) was averaged from 3-km segments in 60-km hexagon grid. Maps by Dan Cushing, Pole Star Ecological Consulting.

# Seabird Bycatch in Hook-and-Line Fisheries

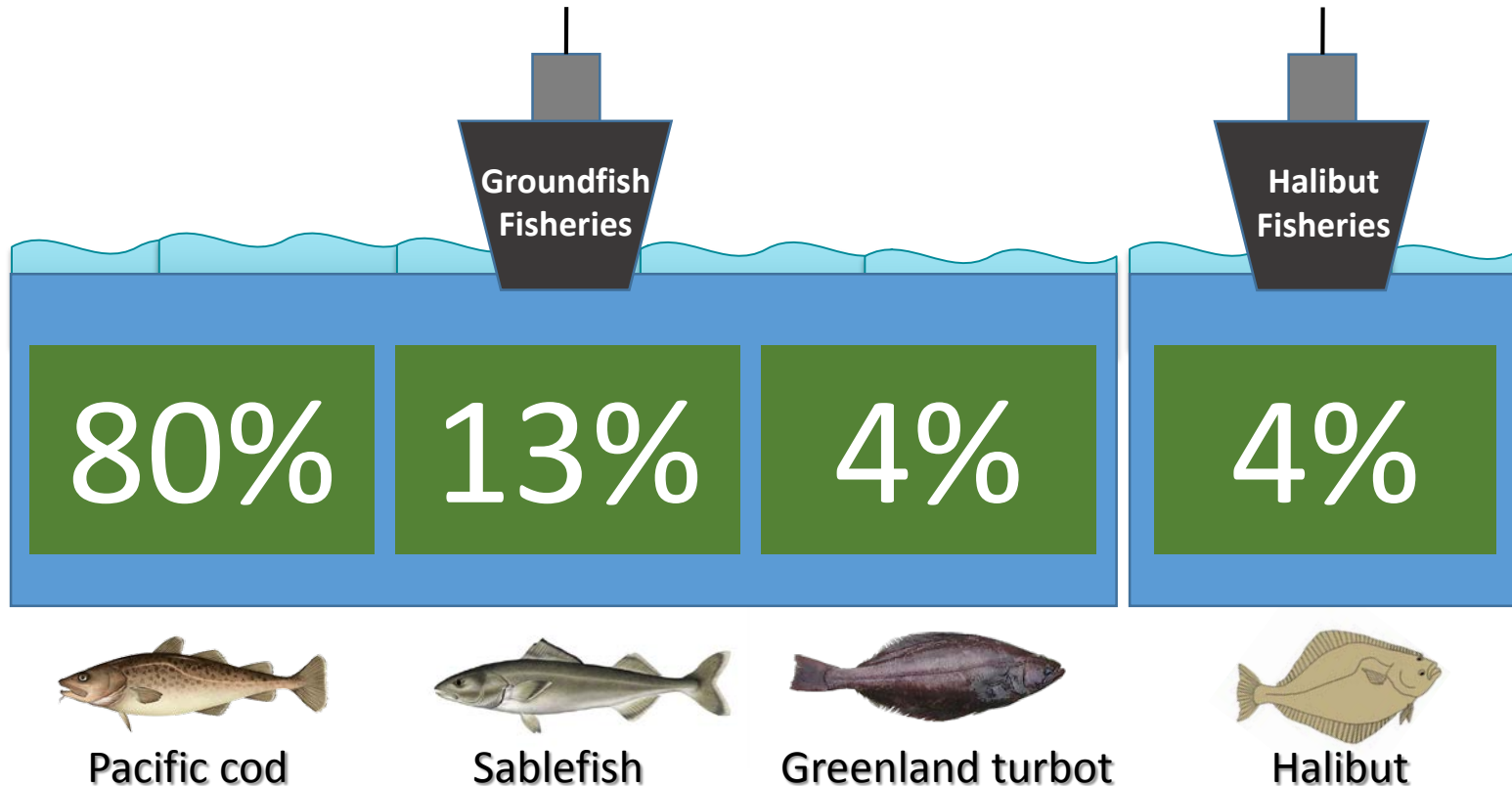
- Groundfish fisheries 2010 - 2017
- Halibut fisheries 2013 - 2017 only
- BSAI and GOA

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
<b>Unidentified Albatrosses</b>	0	10	0	28	33	0	0	0	9
<b>Short-tailed Albatross</b>	15	5	0	0	9	0	0	0	4
<b>Laysan Albatross</b>	222	205	141	201	99	216	131	38	157
<b>Black-footed Albatross</b>	71	222	81	449	278	363	198	787	306
<b>Northern Fulmar</b>	1,902	5,965	2,851	2,694	719	2,886	4,917	3,369	3,163
<b>Shearwaters</b>	502	259	529	195	114	320	3,127	1,152	775
<b>Gulls</b>	1,116	2,226	898	572	730	1,247	748	679	1,027
<b>Kittiwakes</b>	0	6	5	3	4	12	6	23	7
<b>Murres</b>	0	0	6	0	0	0	0	10	2
<b>Puffins</b>	9	0	0	0	0	0	11	0	3
<b>Auklets</b>	0	0	7	0	6	11	0	0	3
<b>Cormorants</b>	0	0	0	0	0	28	0	0	4
<b>Unidentified Birds</b>	267	387	322	292	77	184	296	272	262
<b>Grand Total</b>	<b>4,105</b>	<b>9,284</b>	<b>4,840</b>	<b>4,435</b>	<b>2,069</b>	<b>5,268</b>	<b>9,434</b>	<b>6,329</b>	<b>5,721</b>

# Seabird Bycatch in Hook-and-Line Fisheries

- Groundfish fisheries 2010 - 2017
- Halibut fisheries 2013 - 2017 only
- BSAI and GOA

**Hook-and-line gear: 88% of seabird bycatch (h&l, trawl, and pot)**



# Seabird Bycatch in Pacific Cod Hook-and-Line Fishery

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Unidentified Albatrosses	0	10	0	0	10	0	0	0	2
Short-tailed Albatross	15	5	0	0	3	0	0	0	3
Laysan Albatross	51	28	34	4	21	38	13	8	25
Black-footed Albatross	18	0	0	0	8	0	26	28	10
Northern Fulmar	1,687	4,641	2,497	2,493	587	2,706	4,710	2,691	2,752
Shearwaters	492	125	490	135	43	233	2,934	1,079	691
Gulls	879	1,681	859	435	623	958	604	429	809
Kittiwakes	0	6	5	3	4	12	6	14	6
Murres	0	0	6	0	0	0	0	10	2
Puffins	9	0	0	0	0	0	11	0	2
Auklets	0	0	7	0	6	11	0	0	3
Unidentified Birds	249	378	308	271	77	152	278	247	245
<b>Grand Total</b>	<b>3,401</b>	<b>6,872</b>	<b>4,205</b>	<b>3,342</b>	<b>1,382</b>	<b>4,111</b>	<b>8,582</b>	<b>4,506</b>	<b>4,550</b>



Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	1,687	4,641	2,497	2,493	587	2,706	4,710	2,691	2,752
Shearwaters	492	125	490	135	43	233	2,934	1,079	691
Gulls	879	1,681	859	435	623	958	604	429	809

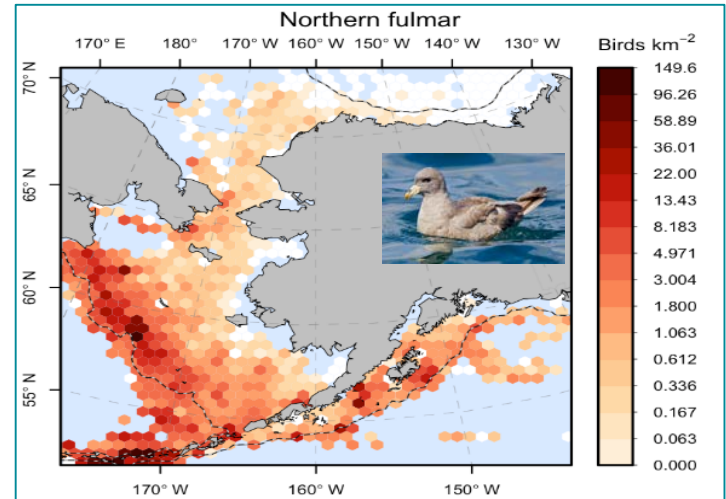
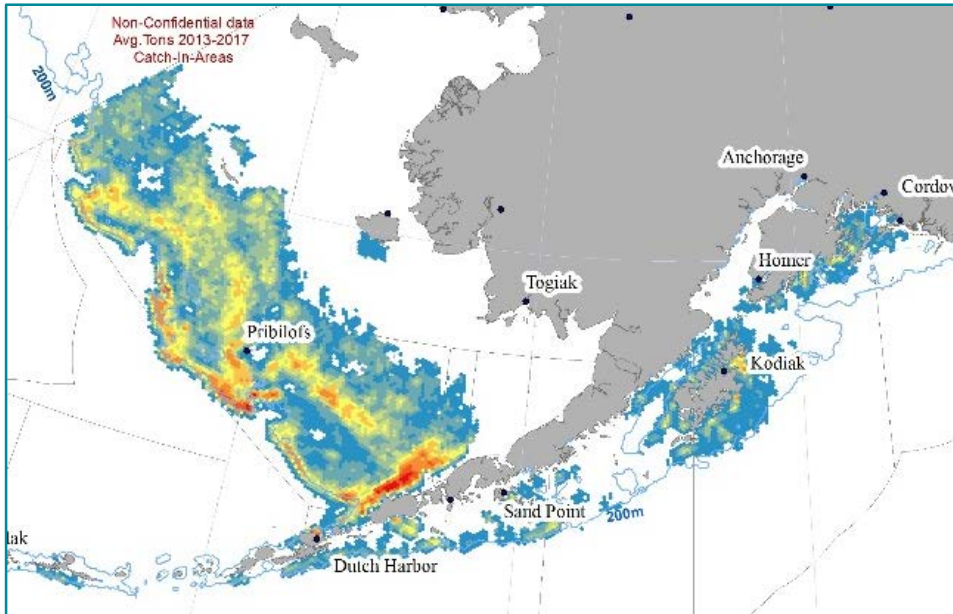


Photo: <http://www.audubon.org/field-guide/bird/northern-fulmar>

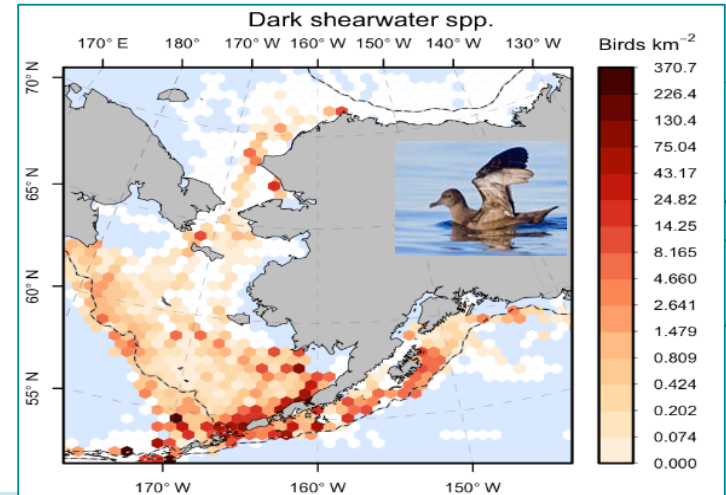


Photo: <http://www.audubon.org/field-guide/bird/sooty-shearwater>



# Seabird Bycatch in Sablefish Hook-and-Line Fishery

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Unidentified Albatross	0	0	0	28	23	0	0	0	6
Laysan Albatross	172	172	107	183	78	144	119	0	122
Black-footed Albatross	52	222	81	398	228	363	171	422	242
Northern Fulmar	44	825	0	136	58	122	19	64	158
Shearwaters	6	96	0	0	71	32	20	0	28
Gulls	220	545	39	47	8	147	90	250	168
Cormorants	0	0	0	0	0	28	0	0	4
Unidentified Birds	6	9	0	0	0	28	19	0	8
<b>Grand Total</b>	<b>501</b>	<b>1,869</b>	<b>227</b>	<b>791</b>	<b>466</b>	<b>863</b>	<b>437</b>	<b>736</b>	<b>736</b>

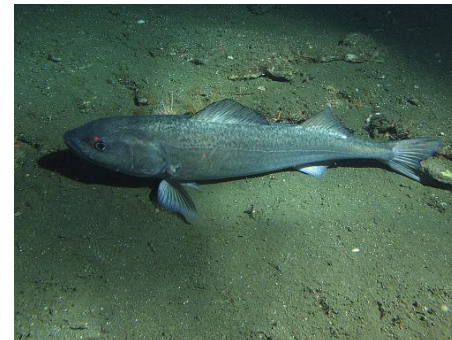


Photo credits: Alaska Fisheries Science Center, NOAA Fisheries Service

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Black-footed Albatross	52	222	81	398	228	363	171	422	242
Northern Fulmar	44	825	0	136	58	122	19	64	158
Gulls	220	545	39	47	8	147	90	250	168

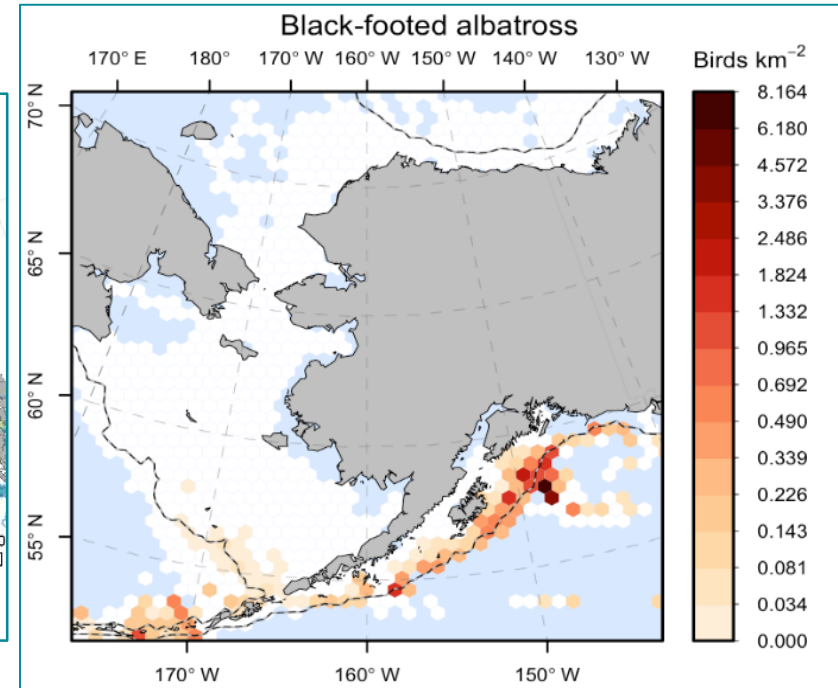
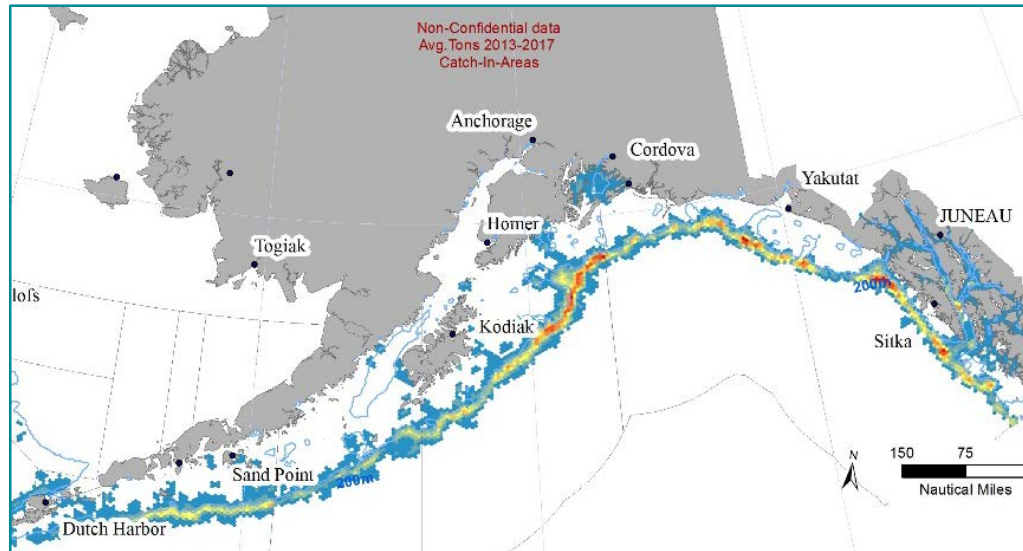


Photo credits: Rob Suryan, Oregon State University

# Seabird Bycatch in Greenland Turbot Hook-and-Line Fishery

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Short-tailed Albatross	0	0	0	0	6	0	0	0	1
Laysan Albatross	0	5	0	0	0	0	0	0	1
Northern Fulmar	171	499	354	65	55	17	82	130	172
Shearwaters	4	38	40	60	0	55	174	14	48
Gulls	17	0	0	0	0	0	0	0	2
Kittiwakes	0	0	0	0	0	0	0	9	1
Unidentified Birds	11	0	15	5	0	0	0	0	4
<b>Grand Total</b>	<b>202</b>	<b>543</b>	<b>409</b>	<b>131</b>	<b>62</b>	<b>72</b>	<b>256</b>	<b>153</b>	<b>229</b>



Photo credit: Anne Richards, Northeast Fisheries Science Center, NOAA Fisheries.



Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	171	499	354	65	55	17	82	130	172
Shearwaters	4	38	40	60	0	55	174	14	48

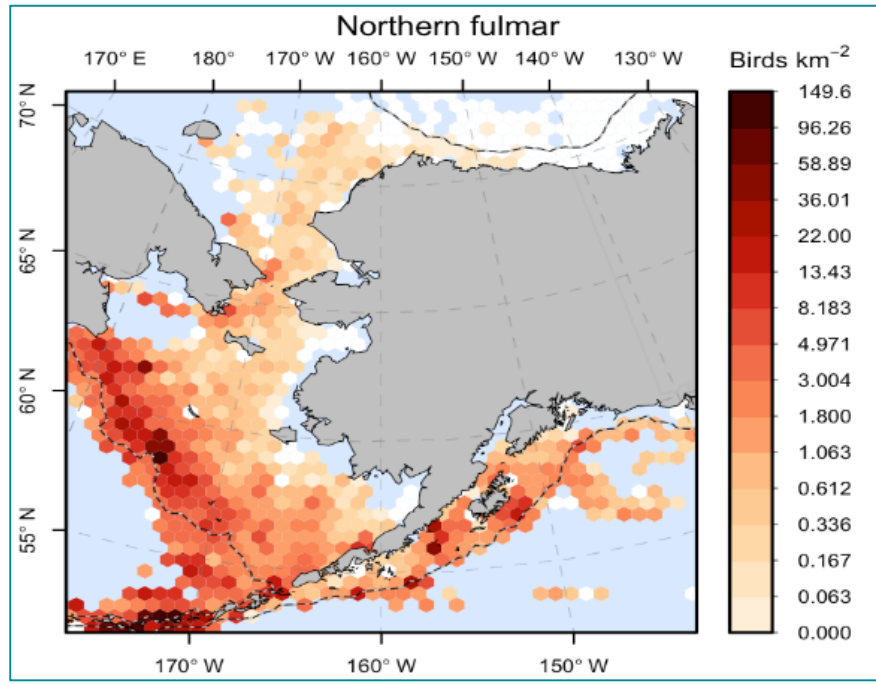
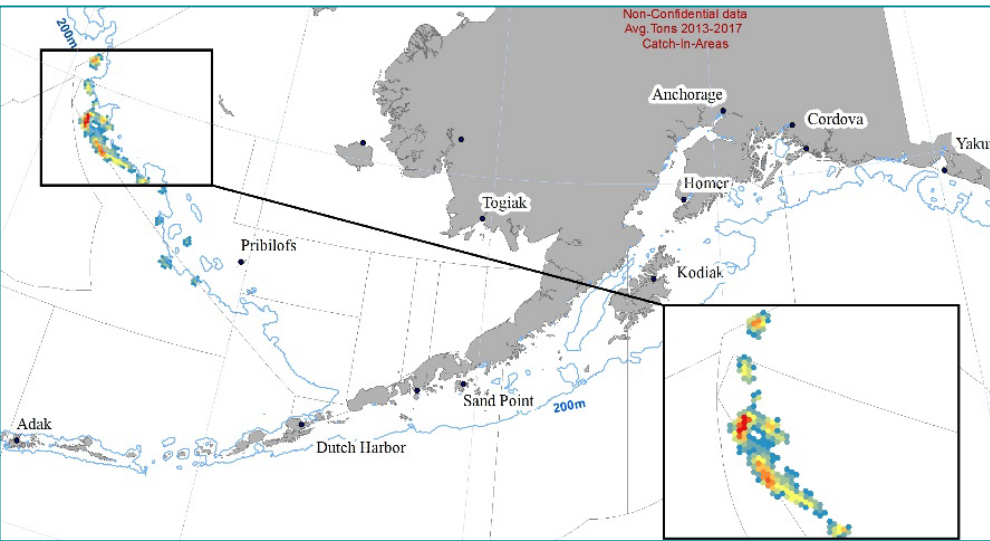


Photo credit: Anne Richards, Northeast Fisheries Science Center, NOAA Fisheries.



Photo: <http://www.audubon.org/field-guide/bird/northern-fulmar>

# Seabird Bycatch in Pacific Halibut Hook-and-Line Fishery

Species/Species Group	2013	2014	2015	2016	2017	Annual Average
Laysan Albatross	14	0	34	0	30	16
Black-footed Albatross	51	42	0	0	336	86
Northern Fulmar	0	19	40	105	480	129
Shearwaters	0	0	0	0	60	12
Gulls	85	99	142	54	0	76
Unidentified Birds	15	0	0	0	25	8
<b>Grand Total</b>	<b>165</b>	<b>159</b>	<b>217</b>	<b>159</b>	<b>930</b>	<b>326</b>



Photo credit: Alaska Fisheries Science Center, NOAA Fisheries Service

Species/Species Group	2013	2014	2015	2016	2017	Annual Average
Black-footed Albatross	51	42	0	0	336	86
Northern Fulmar	0	19	40	105	480	129
Shearwaters	0	0	0	0	60	12

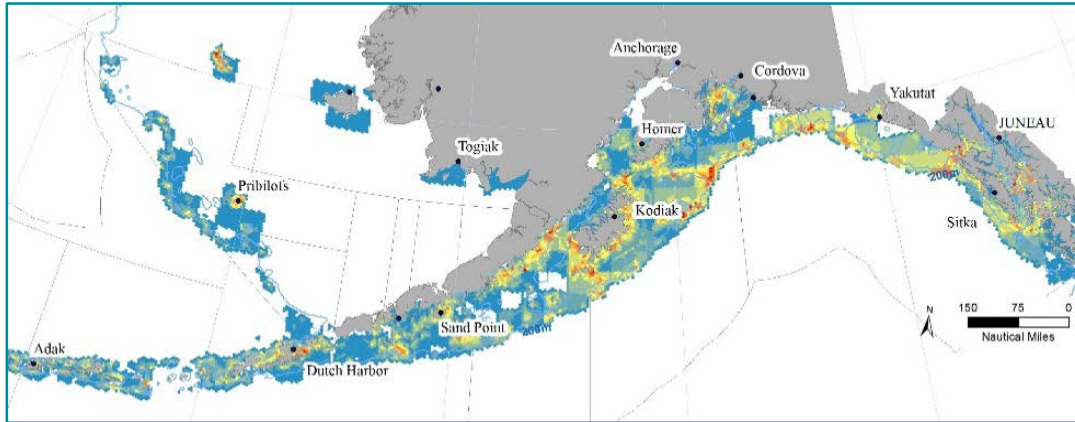


Photo credit: Alaska Fisheries Science Center, NOAA Fisheries Service

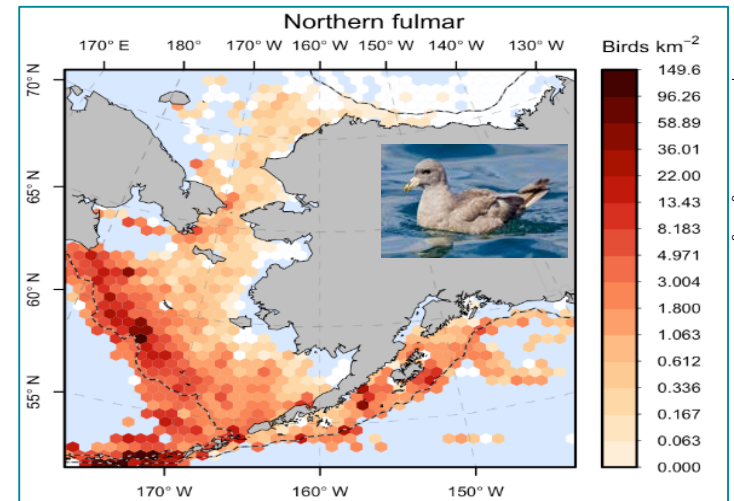


Photo credit: <http://www.audubon.org/field-guide/field/northern-fulmar>

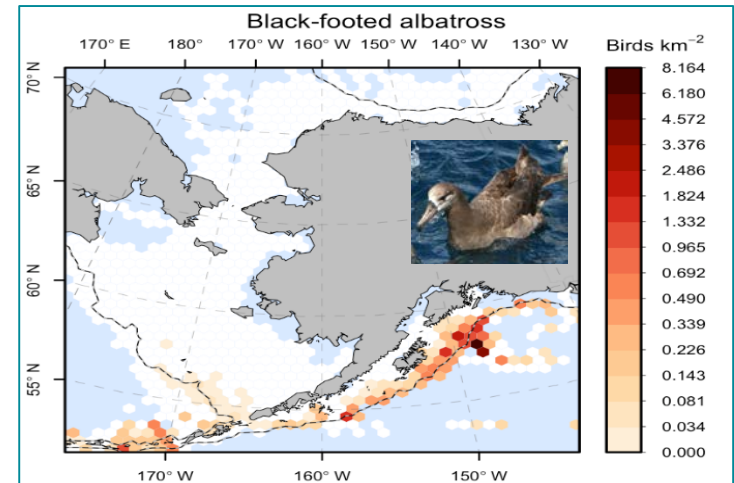


Photo credit: Rob Suran, Oregon State University

# Seabird Bycatch in Trawl Fisheries

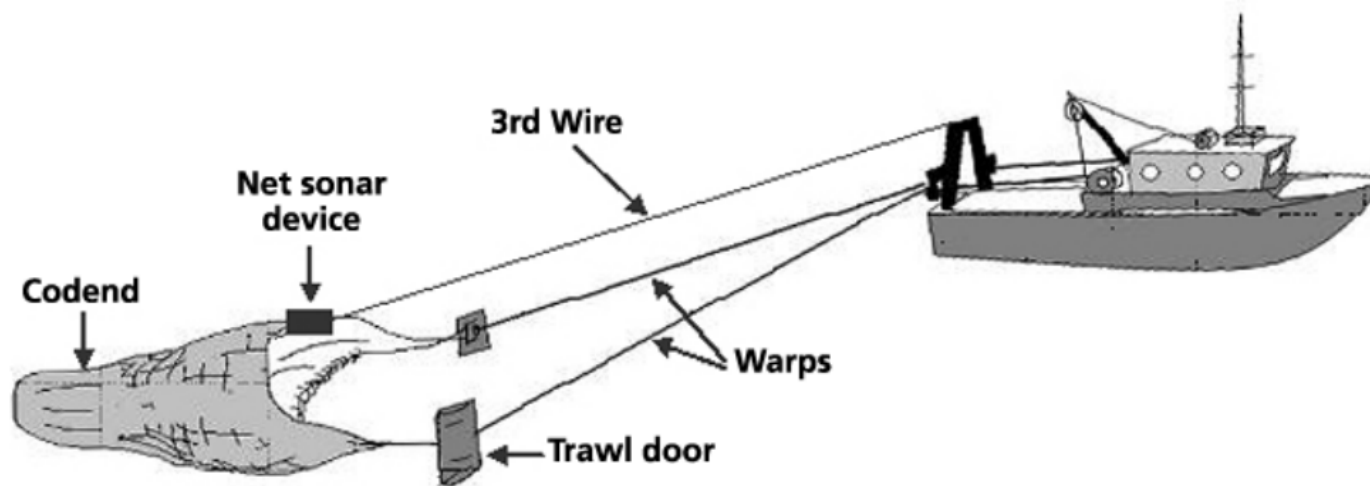


Photo credit: Dietrich and Melvin (2007)

# Seabird Bycatch in Trawl Fisheries

Summary of estimated seabird bycatch in the trawl groundfish fisheries, including all pelagic and non-pelagic gear, in the Bering Sea, Aleutian Islands, and Gulf of Alaska Groundfish FMP areas, 2010 through 2017, as reported in the Catch Accounting System.

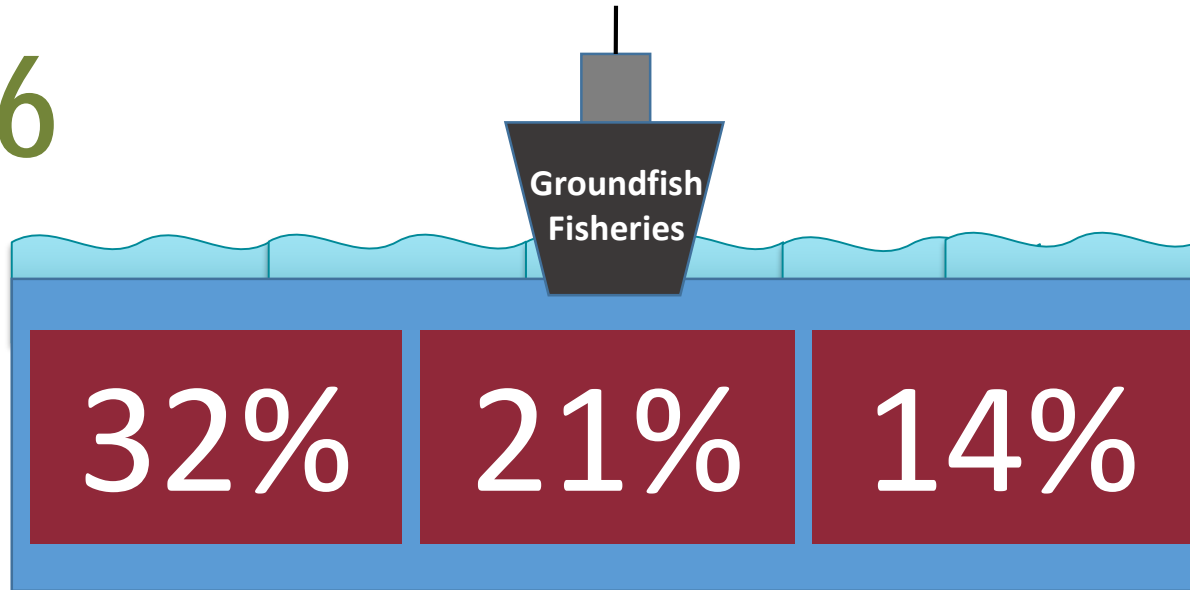
Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Black-footed Albatross	0	0	60	0	0	0	0	0	8
Northern Fulmar	503	329	297	463	85	463	307	372	352
Shearwaters	155	3	56	1	72	62	238	928	189
Gulls	57	1	0	3	0	0	3	0	8
Murres	102	14	0	3	47	0	45	1	27
Auklets	0	0	0	4	66	0	0	0	9
Cormorants	0	0	0	0	0	3	0	0	0
Other Birds	0	0	0	0	0	0	0	63	8
Unidentified Birds	3	0	0	0	0	6	6	0	2
<b>Grand Total</b>	<b>821</b>	<b>347</b>	<b>413</b>	<b>474</b>	<b>270</b>	<b>534</b>	<b>599</b>	<b>1,364</b>	<b>603</b>

# Seabird Bycatch in Trawl Fisheries

- Groundfish fisheries 2010 - 2015
- BSAI and GOA

**Trawl gear: 10% of seabird bycatch (h&l, trawl, and pot)**

2016



Pollock



Atka Mackerel



Yellowfin Sole

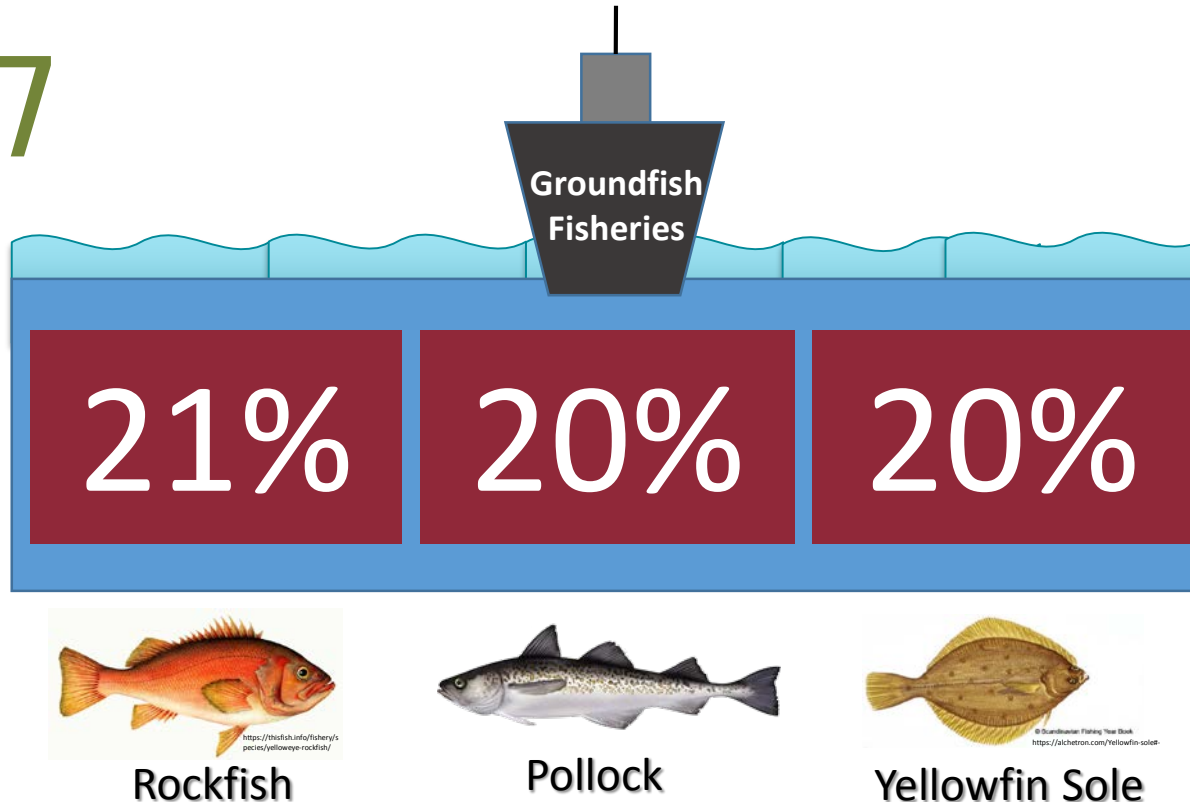


# Seabird Bycatch in Trawl Fisheries

- Groundfish fisheries 2010 - 2017
- BSAI and GOA

Trawl gear: 9% of seabird bycatch (h&l, trawl, and pot)

2017



# Seabird Bycatch in Rockfish Trawl Fishery

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
<b>Black-footed Albatross</b>	0	0	60	0	0	0	0	0	8
<b>Northern Fulmar</b>	34	27	0	0	20	38	0	44	20
<b>Shearwaters</b>	0	0	0	0	0	0	0	772	96
<b>Grand Total</b>	<b>34</b>	<b>27</b>	<b>60</b>	<b>0</b>	<b>20</b>	<b>38</b>	<b>0</b>	<b>816</b>	<b>124</b>





# Seabird Bycatch in Pollock Trawl Fishery

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	69	214	90	123	51	112	84	109	106
Shearwaters	22	3	12	1	3	6	9	0	7
Gulls	0	1	0	3	0	0	3	0	1
Murres	0	14	0	3	3	0	6	1	3
Auklets	0	0	0	4	0	0	0	0	1
Cormorants	0	0	0	0	0	3	0	0	0
Unidentified Birds	3	0	0	0	0	6	6	0	2
<b>Grand Total</b>	<b>94</b>	<b>232</b>	<b>102</b>	<b>134</b>	<b>57</b>	<b>127</b>	<b>108</b>	<b>110</b>	<b>121</b>



Photo credit: Alaska Fisheries Science Center, NOAA Fisheries Service

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	69	214	90	123	51	112	84	109	106

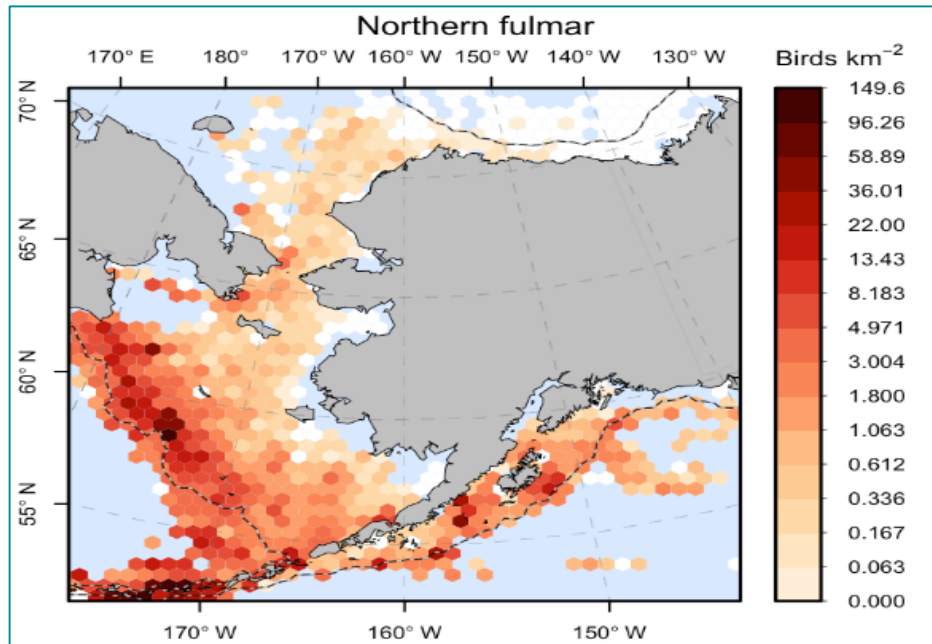
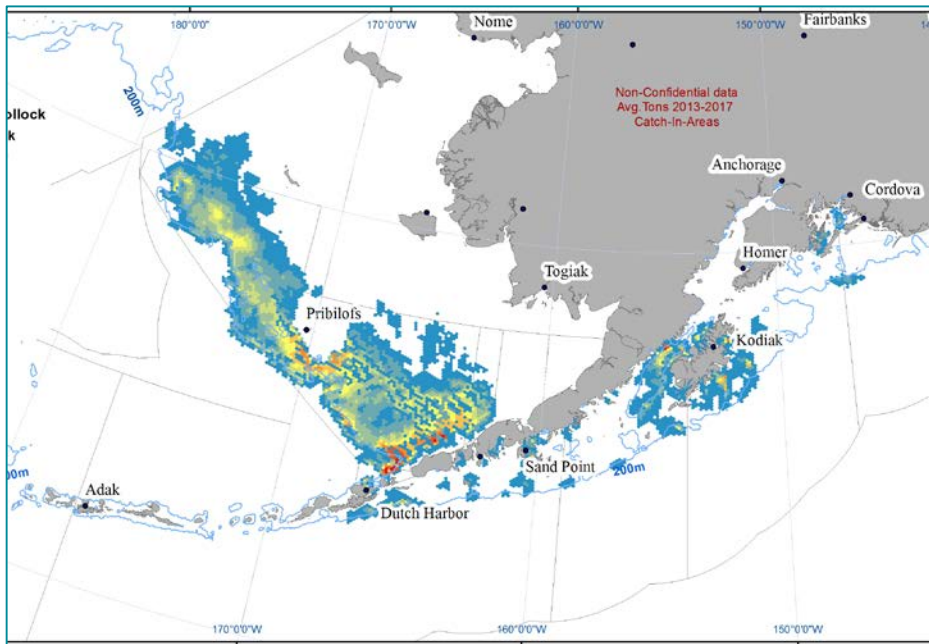


Photo credit: Alaska Fisheries Science Center, NOAA Fisheries Service



Photo: <http://www.audubon.org/field-guide/bird/northern-fulmar>

# Seabird Bycatch in Yellowfin Sole Trawl Fishery

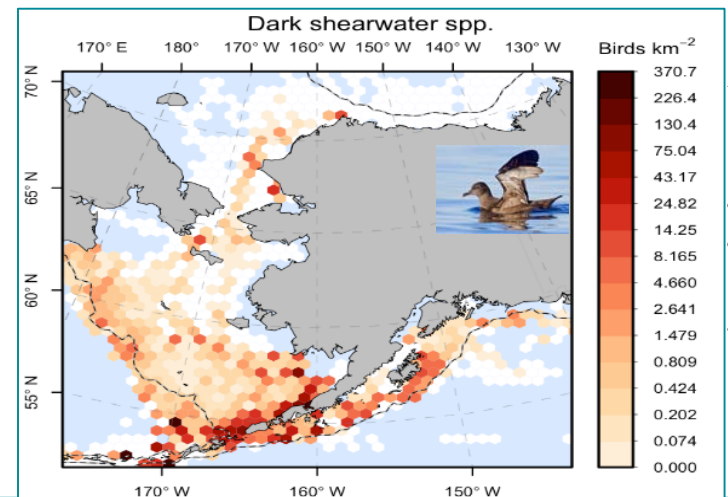
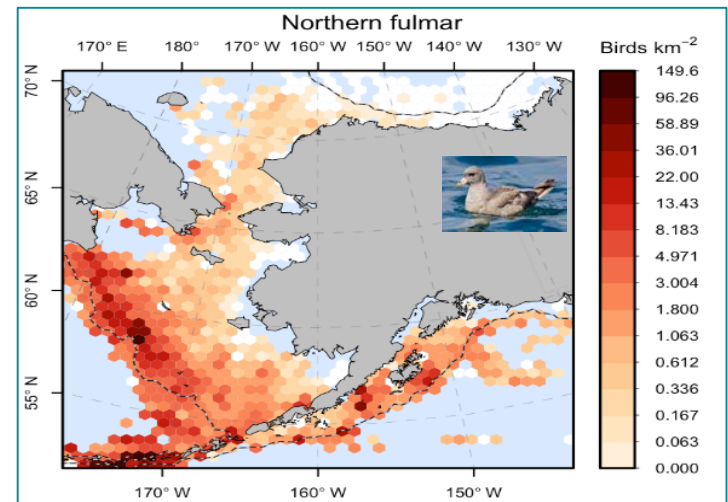
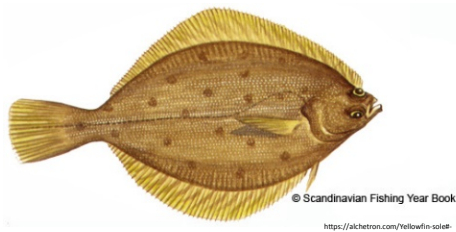
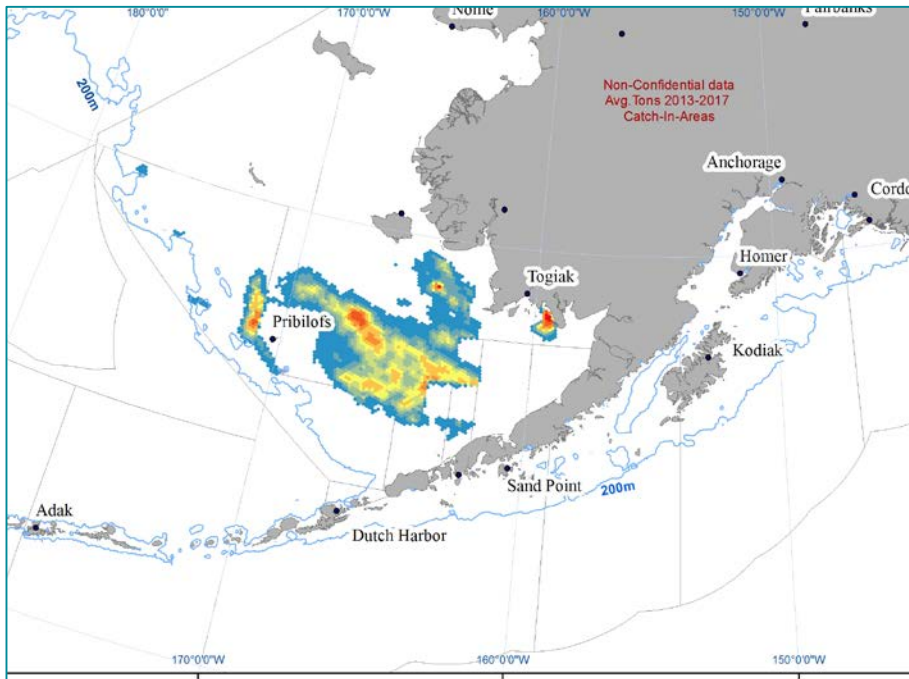
Estimated bycatch of seabird species in the yellowfin sole trawl fishery, 2010 through 2017, as reported in the Catch Accounting System.

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	57	59	0	77	14	0	74	219	63
Shearwaters	58	0	0	0	69	56	45	0	28
Gulls	57	0	0	0	0	0	0	0	7
Murres	78	0	0	0	44	0	39	0	20
<b>Grand Total</b>	<b>250</b>	<b>59</b>	<b>0</b>	<b>77</b>	<b>127</b>	<b>56</b>	<b>158</b>	<b>219</b>	<b>118</b>



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<https://alchetron.com/yellowfin-sole/>

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	57	59	0	77	14	0	74	219	63
Shearwaters	58	0	0	0	69	56	45	0	28



# Seabird Bycatch in Pot Fisheries

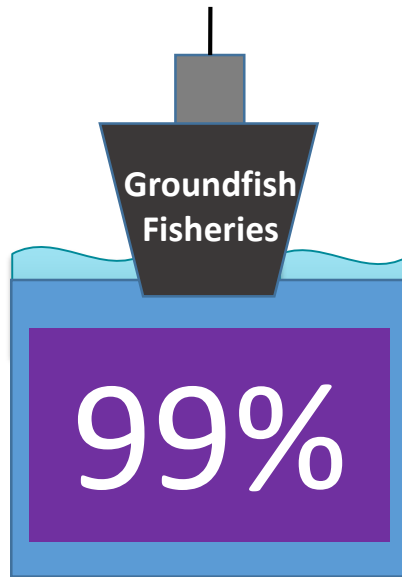


Photo credit: <http://www.oceanbeauty.com/all-eyes-on-cod/>

# Seabird Bycatch in Pot Fisheries

- Groundfish fisheries 2010 - 2017
- BSAI and GOA

**Pot gear: 3% of seabird bycatch (h&l, trawl, and pot)**



Pacific cod

# Seabird Bycatch in Pot Fisheries

Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	69	37	0	20	11	197	234	594	145
Shearwaters	0	0	0	57	0	0	0	0	7
Murres	0	0	0	0	0	0	13	0	2
Auklets	0	0	0	0	35	58	29	36	20
Other Alcids	0	0	0	0	39	0	0	0	5
Unidentified Birds	0	0	20	0	0	0	0	0	3
<b>Grand Total</b>	<b>69</b>	<b>37</b>	<b>20</b>	<b>77</b>	<b>85</b>	<b>254</b>	<b>276</b>	<b>629</b>	<b>181</b>



Species/Species Group	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Northern Fulmar	69	37	0	20	11	197	234	594	145

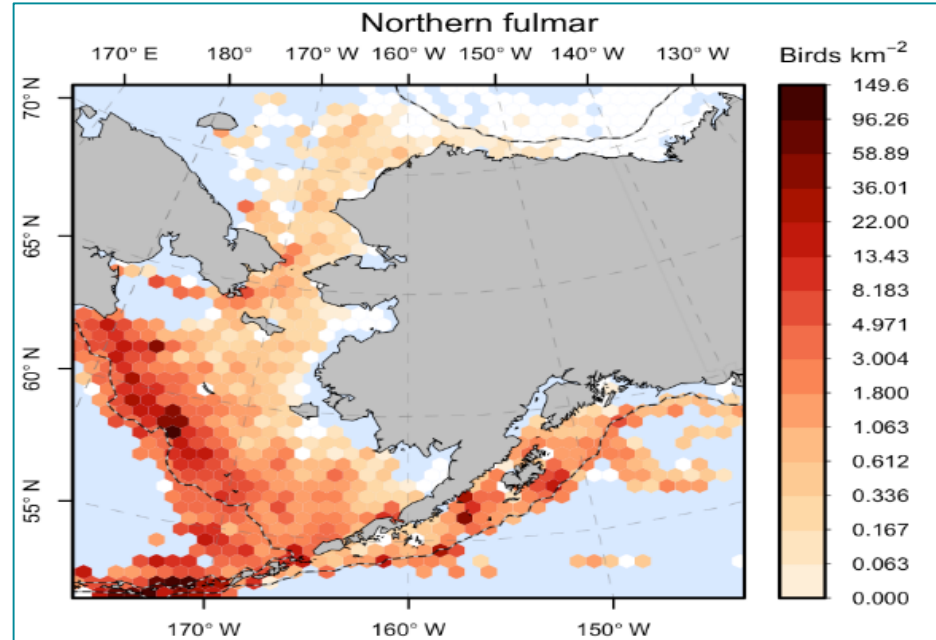
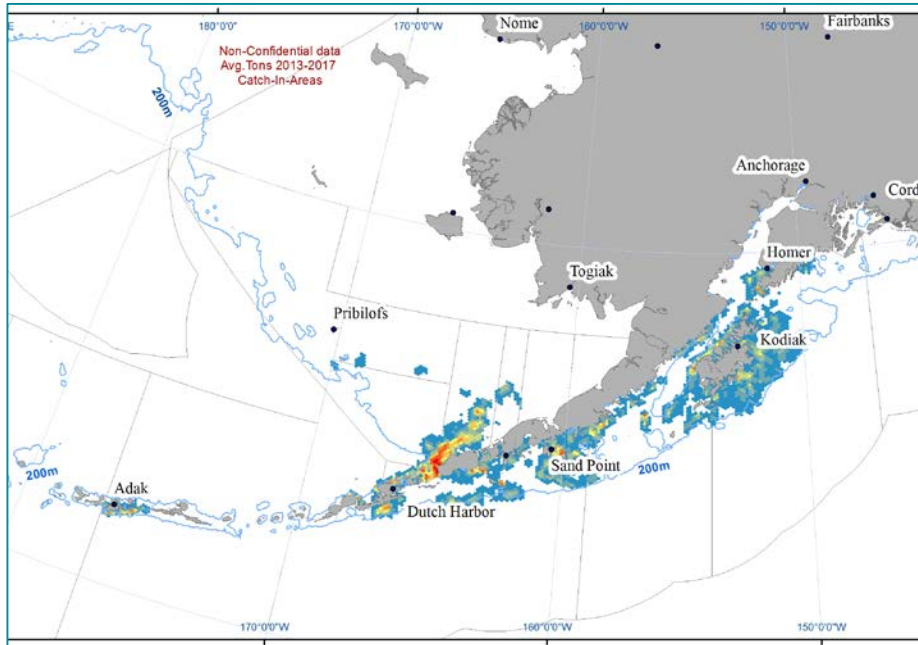


Photo: <http://www.audubon.org/field-guide/bird/northern-fulmar>



# Outline

- 2010 – 2017 Seabird Bycatch Estimates
  - Hook-and-line
  - Trawl
  - Pot
- Alaska Groundfish and Halibut Seabird Working Group

# Short-tailed albatross bycatch



Photo credit: Rob Suryan, Oregon State University

# USFWS 2015 BIOLOGICAL OPINION for the Effects of Alaska Groundfish Fisheries

- Conclusion: The groundfish fisheries are not likely to jeopardize the continued existence of short-tailed albatross.
- Exempted the incidental take of up to 6 short-tailed albatross in a 2 year period from the Take Prohibitions of Section 9 of the ESA.
  - Combined for hook-and-line and trawl
  - Floating 2-year period

# USFWS 2018 BIOLOGICAL OPINION for the Effects of Alaska Halibut Fisheries

- Conclusion: The halibut fisheries are not likely to jeopardize the continued existence of short-tailed albatross.
- Exempted the incidental take of up to 2 short-tailed albatross in a 2 year period from the Take Prohibitions of Section 9 of the ESA.
  - Floating 2-year period

# USFWS 2015 BIOLOGICAL OPINION for the Effects of Alaska Groundfish Fisheries

NMFS shall establish a multi-stakeholder working group to work toward facilitating adaptive management to minimize and avoid take of short-tailed albatross and other seabirds.

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Members:

- NOAA Fisheries
- USFWS
- Alaska Department of Fish & Game
- Oregon Department of Fish & Wildlife
- Washington Department of Fish & Wildlife

**Goal:** Review available information for mitigating effects of the groundfish and halibut fisheries on short-tailed albatross and other seabirds.

**Action:** NMFS will report the resulting recommendations to the North Pacific Fishery Management Council. \*Any changes to seabird avoidance regulations are expected to follow the standard Council process.

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Terms of Reference

The Working Group shall

- Recommend new analyses, reports, or changes to sampling protocols to improve bycatch estimates of seabird species.
- Consider whether the amount or extent of incidental take stipulated in the biological opinions is exceeded.
- Consider whether new information reveals effects in a manner or to an extent not previously considered in the biological opinions.
- Propose, for Council consideration, conservation and management measures to minimize bycatch of seabird species.

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Priorities (in no particular order)

- Explore vessel-specific bycatch mortality
- Explore ways to improve seabird bycatch mitigation measures in the trawl fisheries
- Quantify seabird bycatch in the trawl fisheries
- Explore emerging seabird mitigation technologies
- Outreach - explore and implement additional efforts
- Determine which seabirds (if any) the working group should focus on besides albatross?
- Determine best practices for estimating and reporting bycatch of rare species or events such as seabird bycatch
- Explore use of electronic monitoring (EM) to report seabird bycatch



# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group Meeting September 21-22

## Agenda Topics

- Explore emerging seabird mitigation technologies
- Determine which seabirds (if any) the working group should focus on besides albatross?

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group Meeting March 20-21

## Agenda Topics

- Quantifying seabird bycatch in the trawl fisheries
- Use of electronic monitoring (EM) to report seabird bycatch

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Recommendations (September 2017)

- Generate error (CI) associated with estimates of bycatch using count data. Not necessarily for short-tailed albatross.
- Examine vessel-specific bycatch information
- Formulate questions the Working Group needs answers to then figure out best funding source
- Additional State of Alaska member

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Recommendations (March 2018)

- Assess the effectiveness of using leading indicators as a tool for predicting in-season bycatch risk
  - Potential leading indicators to examine (there may be others):
    - Seabird colony derived abundance and reproduction information
    - At-sea seabird abundance, distribution, and species composition
    - Bottom-up factors including zooplankton size at ice edge, and real-time seabird diet information (diet quality, quantity, and composition)
    - Fisheries factors: behavior of the fleet including spatial distribution and timing, and catch limits of specific fisheries

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Recommendations (March 2018)

- Determine if black-footed albatross bycatch levels are near or exceeding the amount of human-caused mortality a population can withstand [as identified by Bakker et al. (2018)]

# NOAA Fisheries Alaska Groundfish and Halibut Seabird Working Group

## Priorities (in no particular order)

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- Explore use of electronic monitoring (EM) to report seabird bycatch
- Explore leading indicators as tool to assess inseason bycatch risk

