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Seabird Bycatch Estimates for Alaskan Groundfish Fisheries

2021

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Introduction

Seabirds are unintentionally caught in commercial fisheries, and this unintentional catch is referred to as bycatch. Federal law in the U.S. requires bycatch be minimized to the extent practicable, and specific modifications to fishing gear, deployment of mitigation gear, and practices are required by Federal regulation to reduce seabird bycatch. Off Alaska, most seabird bycatch has historically occurred in fisheries using demersal longline (i.e., hook-and-line) gear. Since 2001, seabird bycatch has decreased in fisheries using demersal longline gear off Alaska as a result of initial volunteer efforts and subsequent compliance with seabird avoidance regulations established in 2004 (Melvin et al. 2019). While the occurrence of seabird bycatch is now relatively rare given the level of commercial fishing effort off Alaska each year (average of 0.019 birds per 1,000 hooks from 2002 through 2015; Melvin et al. 2019), bycatch of seabirds does occur and remains an issue in the Federal fisheries off Alaska. For comparisons of seabird bycatch rates between regions, see The National Bycatch Report (<https://www.fisheries.noaa.gov/resource/document/national-bycatch-report>).

NOAA's National Marine Fisheries Service (NMFS) annually updates estimates of seabirds caught as bycatch in commercial groundfish and halibut fisheries operating in waters off Alaska.¹ This annual report details seabird bycatch estimates by gear type for the years 2011 through 2021 and supplements the "Seabird Bycatch and Mitigation Efforts in Alaska Fisheries Summary Report: 2007 through 2015" (Eich et al. 2016), which has been supplemented previously with data from 2018 (Krieger et al. 2019), 2019 (Krieger and Eich 2020), and 2020 (Krieger and Eich 2021). The focus of this report is to add and describe seabird bycatch data for 2021. This report presents bycatch estimates from the following gear types: demersal longline, pelagic trawl, non-pelagic trawl, and pot.²

Endangered Species Act-Listed Seabirds

Short-tailed albatross (*Phoebastria albatrus*) are listed as endangered under the U.S. Endangered Species Act (ESA). On rare occasion, the fisheries using demersal longline gear off Alaska incidentally catch short-tailed albatross. In 2021, NMFS continued to monitor bycatch of short-tailed albatross to assess compliance with the incidental take limit established by the U.S. Fish and Wildlife Service (USFWS) in its 2021 biological opinion on the effects of the groundfish fisheries off Alaska on ESA-listed seabirds (USFWS 2021a). The USFWS anticipated up to six short-tailed albatross could be reported taken bi-annually (every 2 years) as a result of groundfish fishing activities using demersal longline or trawl gear in the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) fishery management plan (FMP) areas (Figure 1).

In 2021, NMFS also continued to monitor bycatch of short-tailed albatross to assess compliance with the incidental take limit established by the USFWS in its 2018 biological opinion on the effects of the halibut fisheries off Alaska on ESA-listed seabirds (USFWS 2018). In its 2018 biological opinion, the USFWS anticipated incidental take of two short-tailed albatross every two years in the halibut fisheries off Alaska. Through informal consultation, the USFWS determined that the halibut fisheries in U.S. Convention waters off Alaska may affect, but are not likely to adversely affect spectacled eider or its

¹ These commercial groundfish and halibut fisheries are prosecuted in state and federal waters off Alaska and may be managed by the State of Alaska, the NOAA Fisheries, or the International Pacific Halibut Commission.

² This report does not include estimates of seabird bycatch in fisheries using gillnet, seine, troll, or jig gear because NOAA Fisheries does not have independent observer data from these fisheries. These estimates also do not apply to State of Alaska-managed salmon, herring, shellfish (including crab), or dive fisheries.

designated critical habitat, or the Alaska-breeding population of the Steller's eider and its designated critical habitat (USFWS 2018).

In addition to the endangered short-tailed albatross, two species of eider are listed under the Endangered Species Act. These are the threatened spectacled eider (*Somateria fischeri*) and the threatened Alaska-breeding population of Steller's eider (*Polysticta stelleri*). Two other populations of Steller's eider occur in waters off Alaska but only the Alaska-breeding population is listed under the Endangered Species Act. Prior to 2019, there had been no reported takes of either the spectacled eider or the Alaska-breeding population of Steller's eider by vessels operating in Federal fisheries off Alaska. However, in 2019 and 2020, spectacled eider and Steller's eider believed to be from the Alaska-breeding population fatally collided with different demersal longline vessels in two separate incidences. Neither of these vessels were fishing at the time of the bird strike mortality events. Since these birds were not taken by fishing gear, they are not included in the bycatch estimates provided in this report.

In 2021, NMFS continued to monitor bycatch and vessel interactions with spectacled eider and Steller's eider from the Alaska-breeding population to assess compliance with the incidental take limit established by the USFWS in its 2021 biological opinion on the effects of the groundfish fisheries of Alaska on ESA-listed seabirds (USFWS 2021a). The USFWS anticipated reported take of up to 25 spectacled eider every 4 years and up to 3 Steller's eider from the Alaska-breeding population every 4 years in the BSAI and GOA FMP areas as a result of groundfish fishing activities using demersal longline or trawl gear in the BSAI and GOA FMP areas (Figure 1).

There have been zero takes of short-tailed albatross, Steller's eider, or spectacled eider in the groundfish fisheries or the commercial Pacific halibut fisheries off Alaska in 2021. Seabird avoidance and mitigation measures remain in place; this includes the use of streamer lines as prescribed at 50 CFR 679.24(e).

Additional Seabird Species of Interest

Albatross are a focal seabird species group for conservations efforts (for more information, see Eich et al. 2016). In addition to the endangered short-tailed albatross, two other species of albatross forage in waters off Alaska: Laysan (*Phoebastria immutabilis*) and black-footed (*Phoebastria nigripes*) albatross. Laysan and black-footed albatross are listed as birds of conservation concern by the USFWS (USFWS 2021b), which means that without additional conservation efforts, they are likely to become candidates for listing under the Endangered Species Act.

Groundfish and Halibut Seabird Working Group

In 2016, NMFS established the Alaska Groundfish and Halibut Seabird Working Group to continually review the best available scientific information for methods to reduce bycatch of albatross, eiders, and other seabirds in the Federal fisheries off Alaska. This group typically meets annually to review seabird bycatch data and trends and to provide recommendations on bycatch mitigation strategies to the North Pacific Fisheries Management Council (NPFMC). The working group did not meet in March 2022 but did provide updates to the Council.

A summary of the Alaska Groundfish and Halibut Seabird Working Group's recommendation and new outreach materials from the USFWS are available here:

<https://meetings.npfmc.org/CommentReview/DownloadFile?p=6997a482-790f-498c-a150-7058945dfb8d.pdf&fileName=B2%20Interagency%20Seabird%20Workgroup%20Report.pdf>

Data Sources and Estimation Methods

Data Sources

Total catch estimates in the groundfish and halibut fisheries off Alaska are generated by the NMFS Alaska Region Catch Accounting System (CAS) and are used to manage approximately 600 separate groundfish quotas in the BSAI and GOA. The CAS uses information from multiple data sources to estimate total groundfish and halibut catch, including at-sea discards and estimates of bycatch of other species including seabirds. Data from the North Pacific Observer Program (Observer Program), dealer landing reports (also known as fish tickets), and at-sea production reports are combined to provide an integrated data source for fisheries monitoring and within season decision-making. The Observer Program is operated by the NMFS Alaska Fisheries Science Center (AFSC), which trains and oversees deployment of NMFS-certified observers (observers) to collect scientific information. The Observer Program was restructured in 2013 to provide coverage in the halibut fisheries; therefore, seabird bycatch data from the halibut fisheries begins in 2013 and are not included in prior year's estimations. Starting in 2018, NMFS integrated electronic monitoring (EM) into the Observer Program, and catcher vessels (CVs) that fish with demersal longline gear were able to request entry into the EM sampling stratum. In 2019, CVs that fish with pot gear were also able to request entry into the EM sampling stratum. The total number of CVs allowed into the EM stratum was determined by available funding, and vessels that opted into EM were not required to carry an observer (NMFS 2017a). In each year since 2018, the total number of CVs in the EM stratum are identified in Annual Deployment Plans (NMFS 2021, NMFS 2020, NMFS 2019, NMFS 2018). At-sea monitoring data, from both observers and EM, are a key part of the CAS and allow the agency to gain an independent measurement of the amount and types of species caught in the commercial groundfish and halibut fisheries in the BSAI and GOA. Observer data provide a direct estimate of species composition and weight, whereas data from EM provide a direct estimate of species counts that are converted to weight. NMFS uses both of these datasets to calculate catch and bycatch rates for unobserved fishing trips.

Observers collect biological samples and fishery-dependent information on total catch and interactions with protected species (AFSC 2020), including fisheries bycatch of seabirds. The Observer Program structures at-sea observer and EM data collection using a statistically reliable sampling design (NMFS 2017a). The CAS uses these monitoring data to estimate seabird mortality, as described in the next section. Information collected by observers and EM provides the best available scientific information to manage the fisheries and to develop measures to minimize bycatch.

Observers collect data on seabird bycatch as part of their species composition sample. Observers identify each bird in their sample to the most accurate species or species group that they can. Species identification is verified for bird specimens by debriefers and by specialists using a subsample of birds collected through the NOAA Pacific Seabird Necropsy Program (necropsy program). The necropsy program provides birds collected by observers from bycatch and ship strikes to a vendor to necropsy and verify the species identification. This process results in making corrections to misidentifications and also more refined species identifications where the observer used a species group code. NMFS is currently revising previous species identifications based on the necropsy verifications. Once updated, future versions of this report will reflect these changes.

As mentioned above, 2018 was the first year that EM was integrated into the Observer Program under regulations. In order to carry an EM system, the vessels must have a NMFS-approved Vessel Monitoring Plan (VMP) that describes how fishing operations on the vessel will be conducted and how the EM system and associated equipment are configured to meet the data collection objectives, including

quantification of seabird bycatch. The VMP specifies that if any seabirds are caught, the vessel operators must hold seabirds up to the camera for 2 to 3 seconds and show certain key parts of the animal, such as the beak, to the hauler view camera.³ The ability to identify seabird species is similar when using observers and EM. During 2016 trials, experts found that protocols for displaying seabirds to the camera and the camera picture quality were sufficient for accurate seabird identification as long as fishermen adhered to the catch handling protocols (NMFS 2017b). Starting in 2020, a new exempted fishing permit (EFP) was issued to allow EM systems to supplement existing observer coverage on pollock CVs using pelagic trawl gear and on tender vessels delivering to processing plants in the GOA and the Bering Sea (BS). All Trawl EM EFP trips are monitored at-sea for compliance with maximum retention requirements using EM. In the BS, shoreside observers sample all deliveries, while a randomly selected one-third of deliveries in the GOA are sampled. The Trawl EM EFP is designed to use EM for compliance monitoring, meaning that EM video does not directly feed into catch accounting or stock assessments. Instead, catch accounting uses industry-reported data (verified through EM) and data collected by shoreside observers. Information on seabirds delivered to the processing plant could be collected by observers as long as the carcasses were made available to them. With maximized retention, the discards are minimized, which is potentially beneficial for seabirds. It will be beneficial because seabirds are attracted to discards. The reduction in discards should result in a decrease of seabird attendance around these vessels, which should result in fewer opportunities for interactions and thus bycatch.

In order to assist vessel operators with ESA-listed seabird identification, the USFWS has developed new seabird identification materials, available here: <https://www.fisheries.noaa.gov/alaska/bycatch/seabird-avoidance-gear-and-methods>. If no observer is onboard, vessel owners or captains are instructed to report any ESA-listed seabird injury or mortality immediately to NMFS (1-800-853-1964 or 907-586-7228) or to the USFWS using the Threatened and Endangered Bird Species Encounter and Reporting Form (found at <https://www.fisheries.noaa.gov/alaska/bycatch/seabird-avoidance-gear-and-methods>). If an ESA-listed seabird mortality occurred and no observer is onboard, vessel owners or captains are instructed to retain carcasses of ESA-listed seabirds.⁴ If this program becomes regulated in the future, this would increase the proportion of trawl vessels using EM versus observers.

There are known sampling biases in estimating total seabird mortality in some commercial fisheries off Alaska (Gilman et al. 2013; Fitzgerald et al. in prep; and summarized in Eich et al. 2016). For example, in the fisheries using longline gear, seabirds may fall off a hook underwater without being seen by the observer or camera. Seabirds that fall off the hooks alongside the vessel but are seen by the observer are recorded if they occur within the observer sampling period. On trawl vessels, “cryptic” (i.e., not readily detectable by observers) seabird mortality can occur due to interactions with gear such as the

³ An example VMP template with the specific seabird handling protocols is available at <https://www.fisheries.noaa.gov/alaska/resources-fishing/electronic-monitoring-alaska>

⁴ If an observer is not on board, a verbal report should be called-in and a written report will be made. The carcass should be immediately frozen, or kept as cold as possible. Due to the rarity of these species, every effort should be made to salvage the carcass. The carcass should be labeled with the vessel name, latitude and longitude, assumed cause of death, and the numbers and colors of any leg bands (leg bands should be left attached). If unable to keep the carcass:

- Three photos should be taken: one of the front with wings outstretched; one from the back with wings outstretched; and one of the head and beak, preferably near a measurement board or other reference of size for the beak.
- A written report of the threatened and endangered species encounter should be made on the U.S. FWS Threatened and Endangered Bird Species Encounter and Reporting Form (link in previous sentence).

trawl warps, net-monitoring equipment (paravanes or third wires), or when seabirds are caught in the net wings and not landed with the fish catch. These mortalities are not included in the estimates reported below. The AFSC is evaluating these additional sources of mortality on trawl vessels, which can be three times the bycatch recorded in standard sampling, to determine the best method to monitor and include them in annual estimates (Fitzgerald et al. in prep).

Estimation Methods

Since 1993, NMFS has used two methods to estimate seabird bycatch for the groundfish fisheries.⁵ From 1993 through 2006, the AFSC produced the seabird bycatch estimates using a ratio estimator (Fitzgerald et al. 2008; AFSC 2014). Since 2007, NMFS Alaska Region has produced bycatch estimates using a ratio estimator in the CAS (Cahalan et al. 2014).

In the CAS, NMFS uses observer data to create seabird bycatch rates (a ratio of the estimated bycatch to the estimated total catch in sampled hauls). NMFS uses the observed information from the at-sea samples to create bycatch rates that are applied to unobserved trips. For trips that are unobserved, the bycatch rates are applied to industry-supplied landings data of retained catch. Expanding on the observer and EM data that are available, the extrapolation from observed trips to unobserved trips is based on varying levels of aggregated data (post-stratification). NMFS matches data based on processing sector (e.g., catcher/processor [CP] or CV), week, target fishery, gear, and Federal reporting area. Further detail on the estimation procedure, including levels of post-stratification, is available in Cahalan et al. (2014, 2010). At each data run, the CAS produces estimates based on current data sets, which may have changed over time. Data can be updated as a result of observer debriefing, data quality checks, and analysis. Examples of the possible changes in the underlying data are changes in species identification, deletion of data sets where data collection protocols were not properly followed, and changes in the landing or at-sea production reports where data entry errors were found. The totals in this report include some changes from previous reporting, and reflect the most recent data and estimates of the CAS. Additionally, within this report, minor differences in the bycatch numbers may exist due to rounding.

For estimation, analysis, and reporting of seabird bycatch, many of the species categories identified by observers and EM are consolidated into a larger group (Table 1). This includes codes for birds that are not identifiable further than the following species groups: albatross, shearwaters, storm petrel, murre, puffin, murrelet, alcid, and unidentified gulls. For example, in this report the species group “Gull” includes all Laridae except kittiwakes, which are reported separately due to conservation interest (especially for red-legged kittiwakes). Most gulls that observers or the necropsy program identify to a specific code within this group are glaucous, glaucous-winged, or herring gulls. Gulls that observers or

⁵ Seabird estimation methods were similar to those used for marine mammal bycatch estimation (<http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-167.pdf>). Both methods use the same primary data sources and a ratio estimator; however, the details, including the methods used for post-stratification, varied between the two approaches. To enable a comparison and transition to the CAS, seabird bycatch estimates were produced using both methods for 2004 through 2006 (Fitzgerald 2011a, 2011b). That comparison showed that the CAS seabird bycatch estimates were higher than the previous methods (Fitzgerald et al. in prep) in the fisheries using longline gear by 4.8 percent, 6.1 percent, and 13.6 percent for 2004 through 2006, respectively. For seabird bycatch estimates of fisheries using trawl gear, the CAS was 7.7 percent higher overall than the previous methods. This difference is likely due to improved ability in the CAS to extrapolate to portions of the fishery that are not directly observed. The previous estimates did not extrapolate to this sector of the fleet.

the necropsy program could not identify to a specific code are classified as unidentified gulls. Many of the unidentified gulls were juveniles that lack certain distinguishing features present on adults. Other birds are a group of miscellaneous birds that could be identified as loon, grebe, seaduck, jaeger/skua, or tern. Unidentified birds could be any of the seabird species listed in Table 1 that the observer could not identify. The Observer Program was originally structured as an interim program with coverage requirements based on groundfish vessel overall length and processing volume. In 2013, the program was restructured and changes were implemented regarding the method to deploy observers, how observer coverage is funded, and which vessels and processors must have some or all of their operations observed (77 FR 70062, November 21, 2012).

The restructured Observer Program has two features that affect seabird bycatch estimates. First, the vessel length-based observer coverage requirements were discontinued, and coverage is now based primarily on fishing mode (CV or CP). Vessels are either in a full coverage category (CPs, with some exceptions) and take an observer on all trips, or in the partial coverage category (CVs, with some exceptions) and take observers on a random selection of their fishing trips. This was an important change that increased the statistical reliability of data collected by the program. Second, the restructured program expanded observer coverage to previously unobserved fisheries including the Pacific halibut longline fishery. Seabird bycatch data are now available from this fishery, whereas in previous years, small amounts of halibut fishery information were collected when an operator had both halibut and sablefish individual fishing quota.

The seabird bycatch estimates from the CAS provide information on numbers of seabird bycatch per metric ton of catch, but this metric is different from how seabird bycatch rates are typically reported in other regions and countries. For example, the international reporting standard for fisheries using longline gear is seabird bycatch (number of birds) per 1,000 hooks. NMFS is developing procedures that will report total effort and bycatch rates consistent with international reporting standards. Preliminary estimates of seabird bycatch per 1,000 hooks for Federal fisheries off Alaska using longline gear are provided by AFSC (Fitzgerald et al. 2008) and Melvin et al. (2019) and are also included in the summary bycatch report (Eich et al. 2016).

Results and Discussion

This report estimates seabird mortality associated with groundfish (2011 through 2021) and halibut (2013 through 2021) fisheries off Alaska and provides detailed descriptions of bycatch in 2021. First, seabird bycatch estimates are provided for all gear types (longline, trawl, and pot) in the combined GOA and BSAI FMP reporting areas (Figure 1) and for each year (Table 2). Second, demersal longline bycatch estimates for the combined BSAI and GOA FMP areas (Table 3) are provided, followed by demersal longline bycatch estimates separated by major FMP area (Table 4 through Table 6), and then separated by harvest sector catcher vessels (CVs) and catcher/processors (CPs) (Table 7). Third, the combined trawl fleet bycatch is shown (Table 8). Fourth, trawl bycatch separated by FMP area (BSAI or GOA) and gear type (pelagic or non-pelagic) is shown (Table 9 through Table 11). Seabird bycatch estimates for the pot fishery are reported in Table 12. Finally, Table 13 provides seabird bycatch estimates by area, gear, target, and species or species group for 2011 through 2021.

The following sections will highlight a slight increase in estimates of seabird bycatch in 2021 from 2020, but estimates of seabird bycatch that are still lower than previous years, on average. In 2020, the COVID-19 pandemic disrupted normal fishing operations throughout Federal fisheries. In Alaska, such disruptions included lost fishing days due to closures and stand-downs (primarily at the beginning of the

pandemic) and reduced market prices for fish as restaurants and other buyers were not operating at normal levels and thus were not purchasing as much fish product. The number of fishing trips in 2020 (13,493) was the lowest over the 2011 to 2020 time-period and down from a high of 19,246 trips in 2016 (NMFS Alaska Region, unpublished data). Less fishing effort would reduce the opportunities for interactions with seabirds and result in less seabird bycatch. The COVID-19 pandemic continued to disrupt normal fishing operations in 2021. Even fewer trips (12,873) were taken in 2021 (NMFS Alaska Region, unpublished data). The overall decrease in trips in 2021 is driven by declines in the number of trips taken by CVs and CPs fishing demersal longline or trawl gear in the Bering Sea. Aside from disruptions associated with the COVID-19 pandemic, the shift in gear usage in the sablefish individual fishing quota (IFQ) fishery continued. Many vessels in this fishery shifted from using hook-and-line gear to using pot gear. This was primarily done in an attempt to avoid whale depredation on sablefish catch. The number of fishing trips utilizing pot gear in the sablefish fishery increased from 274 in 2019 to 654 in 2020, and to 1,123 in 2021 (16.8 percent, 40.8 percent, and 64.8 percent of all sablefish trips, respectively; NMFS Alaska Region, unpublished data).⁶ The proportion of sablefish trips fished using pot gear in 2021 is the highest between 2011 and 2021. Take of seabirds by pot gear is relatively rare compared to take of seabirds by hook-and-line gear. If the sablefish IFQ fishery continues to increase its use of pot gear over hook-and-line gear, we would expect to see reduced take of seabirds in this fishery.

All Gear Types and Fisheries

The 2021 estimated seabird bycatch for the combined groundfish and halibut fisheries (4,509 birds) was just over two-thirds of the 2011 through 2020 annual average of 6,592 birds. Figure 2 depicts estimated seabird bycatch in the groundfish fisheries from 1993 through 2021 using results from the two analytical methods noted above, the AFSC internal analysis for 1993 through 2006 (Fitzgerald et al. 2008) and the CAS for 2007 through 2021. The notable decline in estimated seabird bycatch in 2002 was due to the voluntary deployment of streamer lines as bird deterrents on many demersal longline vessels (Melvin et al. 2001). From 2002 through 2004, staff from NMFS and Washington Sea Grant partnered with commercial fishing vessels (primarily from the freezer longline fleet) to develop best practices and encourage industry buy-in on the use of streamer lines as bird deterrents (for further detail, see Eich et al. 2016). Seabird mitigation measures for longline vessels were implemented by regulations in 2004 and required paired or single streamer lines for vessels larger than 55 feet length overall, which accounted for the vast majority of seabird bycatch.⁷ Since then, annual seabird bycatch in the fisheries using demersal longline gear has remained below 10,000 birds, dropping as low as 2,077 birds in 2014 (Table 3).

In an analysis of 2021 seabird bycatch prepared for this paper, 53 percent (2,368 birds) of estimated seabird bycatch occurred in the BS, 36 percent (1,605 birds) in the Aleutian Islands (AI), and 12 percent (535 birds) in the GOA. These proportions of seabird bycatch from the BS and GOA are lower compared to their 2011 through 2020 average proportions (BS [77 percent]; GOA [14 percent]). The proportion of seabird bycatch from the AI is higher than its 2011 through 2020 average (AI [9 percent]; Figure 3). In

⁶ The trip counts provided here are based on the NMFS Alaska Region Catch Accounting System (CAS) and the regulatory definition of a fishing trip (50 CFR part 679.2). These counts may differ from trip counts previously published in the North Pacific Observer Program Annual Reports, because they include state managed fisheries, are not based on Observer deployments, and reflect current data rather than a previous snapshot in time.

⁷ See regulations at 50 CFR part 679.24(e)(2) for more specific requirements, including exceptions for location and weather conditions.

the time-series analyzed, seabird bycatch in the AI has only been higher than in the GOA four times, in 2015, 2019, 2020, and 2021.

Seabird bycatch estimates in 2021 were dominated by shearwaters (Family Procellariidae; 54 percent; Table 2; Figure 4). Estimated shearwater bycatch in 2021 (2,447 birds) was almost twice the 2011 through 2020 average (1,354 birds per year) and was the third highest year compared to 2019 (5,273 birds) and 2016 (3,413 birds). Although dead shearwaters were reported to USFWS between July and September of 2021, the scale of the die-off event appears to be smaller than the one witnessed in 2019 (E. Labunski, USFWS, personal communication, June 9, 2022). The highest estimated bycatch of shearwaters ever reported in the fisheries off Alaska was in 2019. Shearwater bycatch increased by an estimated 700 percent from 2018 to 2019. The unusually high amount of shearwater bycatch in 2019 corresponds to the shearwater mortality event observed throughout Alaska that year. It is believed that changing ocean conditions resulted in depleted food resources for shearwaters causing them to more aggressively target fishing vessels and fishing bait (USFWS 2019). Shearwater bycatch has ranged from 3 percent to 59 percent of the total estimated seabird bycatch from 2011 through 2021. Average annual mortality for shearwaters from 2011 through 2021 has been 1,454 birds. The total worldwide population of short-tailed shearwaters (*Ardenna tenuirostris*) and sooty shearwaters (*Ardenna grisea*) is estimated to be 43 million birds (Denlinger 2006; calculated from Table 2 in Eich et al. 2016).

In 2021, Northern fulmar (*Fulmarus glacialis*) were the second most frequently occurring birds in the bycatch (25 percent; Table 2; Figure 4). Estimated Northern fulmar bycatch (1,120 birds) decreased by 55 percent compared to 2020 (birds per year) and was 69 percent lower than the 2011 through 2020 average (3,569 birds per year). Fulmar bycatch has ranged from an estimated 25 percent to 69 percent of the total seabird bycatch from 2011 through 2021. Average annual mortality for Northern fulmar since 2011 has been 3,346 birds (2011 through 2021). When compared to the estimated total population size of Northern fulmar in Alaska of 1.4 million birds (Denlinger 2006), observed fisheries account for an annual mortality of 0.25 percent. While this mortality is low, local population depletions could become a conservation issue as colony-specific mortality rates have been shown to be disproportionate to population size (Baetscher et al. 2022).

In 2021, black-footed albatross were the third most frequently occurring birds in the bycatch (8 percent; Table 2; Figure 4). Black-footed albatross are discussed further in the next section.

Albatross

No takes of short-tailed albatross were observed in the groundfish fisheries in 2021. The incidental take statement in the 2021 biological opinion on the groundfish fisheries anticipated the take of no more than six short-tailed albatross in a two-year period (either by demersal longline or trawl; USFWS 2021a). The take of two short-tailed albatross in 2019 was the first observed take of short-tailed albatross in the Alaska groundfish fisheries (either by demersal longline, trawl, or pot) since December 2014.

No takes of short-tailed albatross were observed in the halibut fisheries in 2021. The incidental take statement in the 2018 biological opinion on the halibut fisheries anticipated the take of no more than two short-tailed albatross in a two-year period (USFWS 2018). No observed take of short-tailed albatross has occurred in the halibut fisheries since 1987. Of note is that prior to the restructuring of the Observer Program in 2013, the halibut fisheries had no at-sea coverage. Since 2013, at-sea coverage occurs on halibut vessels greater than or equal to 40 feet length overall.

In addition to the endangered short-tailed albatross, there is also conservation concern for Laysan and black-footed albatross (USFWS 2021b). In 2021, 400 albatross (343 black-footed albatross, 57 Laysan

albatross, 0 short-tailed albatross; Figure 5) were estimated to have been caught in the fisheries off Alaska; a decrease of 8 percent compared to the 2011 through 2020 average (434 birds per year). Laysan albatross bycatch in 2021 was double the bycatch estimated for this species in 2020 (29 birds), but was 58 percent lower than the 2011 through 2020 average (136 birds). Laysan albatross bycatch has ranged from less than 1 percent to 5 percent of total estimated seabird bycatch per year since 2011. Black-footed albatross were the third most frequently occurring seabird group in the bycatch (8 percent) in 2021. Black-footed albatross bycatch was over four times higher in 2021 (343 birds) compared to 2020 (81 birds), but the estimated bycatch of black-footed albatross in 2021 was 48 percent less than the highest bycatch estimate in 2017 (717 birds). Black-footed albatross bycatch has ranged from 2 percent to 12 percent of the total estimated seabird bycatch from 2011 through 2021. The estimated population size of black-footed albatross is 61,700 breeding pairs (Naughton et al. 2007).

As noted earlier, the 2013 through 2021 bycatch estimates included two sources of seabird mortality that previous years did not include: vessels less than 60 feet length overall in the groundfish fisheries and the entire halibut fishery. Including these smaller vessels and the halibut fishery provides a better estimate of overall albatross bycatch in Alaska. The total estimated 2013 through 2021 albatross bycatch in the sablefish fisheries (3,567 birds) surpassed the estimated bycatch from the halibut fishery (817 birds). Although albatross habitat overlaps with both the sablefish and the halibut fisheries, albatross spend more time over continental shelf break and slope habitat (Fischer et al. 2009; Suryan et al. 2007), which is most commonly associated with the sablefish fishery; the halibut fishery generally occurs in shallower water on the shelf. Thus, more interactions between albatross and sablefish vessels would be expected, unless albatross or fisheries shift their distribution in a given year. As discussed earlier, there is an increase in use of pot gear versus hook-and-line gear by the sablefish fishery primarily in an attempt to avoid whale depredation on sablefish catch. The number of fishing trips utilizing pot gear in the sablefish fishery has been increasing for the last 3 years (16.8 percent, 40.8 percent, and 64.8 percent of all sablefish trips in 2019, 2020, and 2021, respectively; NMFS Alaska Region, unpublished data) and the proportion of sablefish trips fished using pot gear in 2021 is the highest between 2011 and 2021. Because take of seabirds by pot gear is relatively rare compared to take of seabirds by hook-and-line gear, we expect to see reduced take of seabirds in this fishery.

Demersal Longline Gear

Based on standard observer sampling protocols, demersal longline gear in Alaska groundfish fisheries accounted for 63 percent of the estimated seabird mortality in 2021 (2,843 birds), which is comparatively lower than the average estimated seabird mortality from 2011 through 2020 (85 percent; range 75 to 96 percent).

From 2011 through 2021, most of the estimated seabird bycatch from demersal longline gear occurred in the BS (81 percent) when compared to the AI (4 percent) and GOA (14 percent). In fact, most (69 percent) of the total (all gear types) seabird bycatch off Alaska occurred in the BS from fisheries using demersal longline gear (range 46 percent to 86 percent from 2011 through 2021).

The 2021 estimated seabird bycatch by demersal longline gear was shearwaters (39 percent; 1,116 birds), Northern fulmar (29 percent; 829 birds), and Black-footed albatross (12 percent; 343 birds; Table 3; Figure 6). This is consistent with the trends seen when all gear types combined. Estimated bycatch of Northern fulmar in 2021 was comparatively lower when compared to the 2011 through 2020 times series average (3,059 birds per year).

Estimates of seabird bycatch were also analyzed to compare CPs and CVs by Region. In the BSAI, 94 percent of the total estimated seabird bycatch for vessels using demersal longline gear occurred on CPs in 2021 (2,230 birds). This is lower than the 2011 through 2020 time series average (96 percent; 4,710 birds; range of 1,414 to 8,816 birds). Northern fulmar, shearwaters, and gulls accounted for 91 percent of total estimated bycatch for CPs in 2021 (777; 1,113; 142 birds, respectively). On CVs, Northern fulmar (18 birds), shearwaters (3 birds) and gulls (52 birds) comprised 73 of the 137 total estimated seabirds caught as bycatch in the BSAI in 2021 (Table 7). Demersal longline gear in the BSAI accounted for none of the Black-footed albatross bycatch in 2021.

In the GOA, 98 percent of total estimated seabird bycatch for vessels using longline gear occurred on CVs in 2021 (468 birds). This proportion is slightly more than the 2011 through 2020 average (707 birds; 90 percent). Black-footed albatross and gulls were the two most prevalent seabird bycatch species for CVs in 2021 (339 and 69 birds, respectively; Table 7). The difference in proportion of seabird bycatch attributed to CVs and CPs in the BSAI and GOA is most likely a reflection of the differences in fleet characteristics between the two regions. In the BSAI, most of the longline effort is by CPs targeting Pacific cod, while in the GOA, most of the longline effort is by CVs targeting halibut, sablefish, and Pacific cod.

Of the demersal longline fisheries that have seabird bycatch, the bulk of recent fishery effort in the BSAI occurs in the Pacific cod demersal longline fleet (Table 13). While this fishery accounts for the greatest amount of seabird bycatch (2011 through 2021 average of 67 percent), it captures an average of 5 percent of the total albatross bycatch. However, nearly all of the estimated short-tailed albatross takes that have occurred since 2003 have been in the Pacific cod demersal longline fleet (26 of the total 33 birds), while the remainder were taken in the Greenland turbot demersal longline fishery. The CPs that fish the Greenland turbot fishery also participate in the Pacific cod fishery, using the same gear.

Trawl Gear

When discussing seabird bycatch attributed to trawl gear, it is important to remember that standard observer sampling does not account for all seabird mortality. This discussion focuses only on the numbers reported, which were generated from the standard observer sample (i.e., birds caught in the codend part of the net and brought aboard the vessel). A number of efforts are underway to better understand the amount of cryptic mortality related to trawl vessels and how to properly extrapolate that to provide a fleet-wide estimate. Those numbers will be provided pending completion of ongoing research and development.

Seabird bycatch related to trawl gear constitutes about 13 percent (range 4 to 37 percent) of the overall estimated 2011 through 2021 seabird bycatch (Table 2 and Table 8). The 2021 proportion of estimated seabird bycatch attributed to the fisheries using trawl gear (37 percent, 1,665 birds) is nearly three times the 2011 through 2020 time series average proportion (11 percent, 725 birds).

Similar to demersal longline gear described above, shearwaters dominate the estimated bycatch of seabirds from trawl gear in 2021 (1,331 birds; Table 8). Aside from shearwaters, the rest of the estimated bycatch from trawl gear in 2021 was comprised of 291 Northern fulmar, 36 storm petrels, and 7 kittiwakes. In general, Northern fulmars and shearwaters constitute the vast majority of the estimated seabird bycatch from trawl gear from 2011 through 2021. There is substantial inter-annual variability in bycatch of Northern fulmars (average of 338; range of 85 to 463 birds) and shearwaters (average of 419 birds; range of 1 to 1,781 birds) from 2011 through 2021 (Figure 7). The year 2019 was the first year in

the current time series that kittiwakes (*Rissa* spp.) bycatch occurred in this fishery. In 2021, 7 kittiwakes were taken from the BSAI pelagic pollock trawl fishery.

Most estimated seabird bycatch taken by trawl gear occurs in the BSAI, averaging 92 percent of the trawl seabird bycatch from 2011 through 2021 (Table 9). Only a minimal amount of estimated Northern fulmar, black-footed-albatross, and shearwater bycatch is attributed to trawl gear in the GOA from 2011 through 2021 (Table 10).

Albatross bycatch in Alaska groundfish trawl fisheries is generally rare. No endangered short-tailed albatross takes by trawl gear have been observed in the fisheries off Alaska. In 2012, a black-footed albatross mortality was observed in the trawl fleet for the first time since monitoring started in 1993, extrapolating to an estimated 60 birds taken for the GOA fleet that year. In 2018, an unprecedented estimate of 80 Laysan albatross were taken in the rockfish fishery in the BSAI (Table 13). In 2019 and 2020, an estimated three and eight Laysan albatross were taken in the trawl fishery, respectively (Table 9). From 2010 through 2017, no Laysan albatross were reported for any trawl fishery. The reasons for the high Laysan albatross estimate in 2018 are unclear. Prior to 2007, only Laysan or unidentified albatross were observed in fisheries using trawl gear (Fitzgerald et al. 2008). However, although not currently captured in the data, at-sea observers have reported Laysan albatross mortalities from gear collisions (primarily third wires) throughout the period reported here (Shannon Fitzgerald, AFSC, unpublished data). The AFSC is evaluating how these opportunistic data can be reported in a meaningful way.

For 2011 through 2021, non-pelagic gear accounted for 86 percent of trawl seabird mortality. Northern fulmar, Shearwaters, and Storm Petrel bycatch were the only non-pelagic trawl gear bycatch in 2021 (188, 1,324, and 36 birds, respectively; Table 11). For 2011 through 2021, seabird bycatch in pelagic trawl gear ranged from 41 to 232 birds (average of 116 birds). The first reported take of an albatross from pelagic trawl gear occurred in 2019 (3 Laysan albatross) and 8 more Laysan albatross were estimated to have been taken in 2020. No albatross were estimated to have been taken in 2021 by trawl gear. From 2011 through 2021, most bycatch of all albatross, Northern fulmars, shearwaters, and storm petrels occurred in non-pelagic gear.

Approximately 2 percent of the total estimated seabird bycatch from trawl fisheries from 2011 through 2021 occurred on CVs (207 birds). As such, a comparison analysis of CVs to CPs was not done for this gear type.

Pot Gear

Pot gear remains the gear type with the least amount of estimated seabird bycatch (Table 12), representing an average of 2.8 percent of the total seabird bycatch from all gear types from 2011 through 2021 (range 0 to 13.4 percent). In 2021, there was no estimated seabird bycatch from pot gear. This was the lowest estimate in the 2011 through 2021 time series (next lowest was 0.4 percent in 2011, 2012, and 2019). While zero seabird bycatch in pot gear has not been seen in recent years, observing seabirds in pot gear is typically a rare event; it is not unexpected that there would be a year with no observed seabird bycatch in pot gear. Seabird bycatch in pot fisheries occurs primarily in the BSAI with very little bycatch occurring in the GOA.

Only Northern fulmars, shearwaters, gulls, murre, and alcids have been taken as bycatch in pot fisheries. It is likely that the surface and near-surface foragers (Northern fulmars, shearwaters, and gulls) are actually “captured” in pots as a result of collisions with pots on deck during bad weather, or by birds that wander into a pot on deck (as reported by several fisheries observers), and are then in the pot as it

is deployed. Diving birds may enter a pot while it is fishing. Some of these birds may be regurgitated from Pacific cod stomachs when the cod are captured. Observers have collected full-sized murre (*Uria* spp.) and tufted puffins (*Fratercula cirrhata*) from Pacific cod stomachs and some seafood processing plants also reported small alcids in cod stomachs (Shannon Fitzgerald, AFSC, unpublished data), so this might be a contributing factor.

Annual Variation

A variety of factors could influence seabird bycatch and our ability to accurately estimate bycatch, including changes in fishing behavior, implementation of seabird avoidance gear, observer coverage, seabird distribution, population trends, prey availability, and other ecosystem changes. Determining how seabird bycatch numbers and trends are linked to changes in ecosystem components is difficult because many covariates affect seabird bycatch rates, and the relative importance of the different factors is difficult to parse. Fishermen have noted in some years that the birds appear “starved” and attacked baited demersal longline gear more aggressively (AFSC 2014). This behavior was again observed in 2019 when large numbers of shearwaters were caught in demersal longline gear. This large uptick in shearwater bycatch corresponded to a large shearwater mortality event that occurred throughout Alaska. Upon examining the carcasses, starvation and possible exposure to saxitoxin (a biotoxin associated with paralytic shellfish poisoning) were determined to be the probable cause of death (USFWS 2019). As discussed earlier, seabird bycatch estimates in 2021 were dominated by shearwaters with estimated bycatch (2,447 birds) of almost twice the 2011 through 2020 average (1,354 birds per year) and was the third highest year compared to 2019 (5,273 birds) and 2016 (3,413 birds). Although dead shearwaters were reported to USFWS between July and September of 2021, the scale of the die-off event appears to be smaller than the one witnessed in 2019 (E. Labunski, USFWS, personal communication, June 9, 2022). The cause of this die-off in 2021 is unknown at this time.

The demersal longline fishery off Alaska typically dominates the overall estimated bycatch trends, although we have previously noted the bias in reported trawl-related mortality estimates (for further detail, see Eich et al. 2016). Fishing effort has been known to shift based on market prices for particular fish species, the available harvest levels of target and non-target fish species, prohibited species limits, and weather. These changes in fishing effort can affect bycatch numbers.

Seabird bycatch is best characterized as having a high degree of inter-annual variability (Figure 2). Large variation in overall seabird bycatch occurred between 2011 and 2021, with the largest change from one year to the next totaling 5,353 birds between 2019 and 2020 (Table 2). This variation could indicate changes in food availability rather than drastic changes in how well the fleet employs mitigation gear. A focused investigation of the relationship between food availability and seabird bycatch is needed and could inform management of poor ocean conditions if seabird bycatch rates (reported in real time) were substantially higher than normal.

Variation in seabird bycatch is largely driven by the demersal longline fisheries. Between 2019 and 2020, bycatch estimates dropped by 4,096 birds in the demersal longline fisheries. Bycatch of Northern fulmar, shearwaters, and black-footed albatross in the fisheries using demersal longline gear decreased from 2019 to 2020 (Northern fulmar from 2,633 birds to 1,607 birds, shearwaters from 3,492 birds to 385 birds, and black-footed albatross from 218 birds to 81 birds).

An important aspect of these data is that the Observer Program was restructured in 2013 when observers were placed on vessels less than 60 feet length overall (for demersal longline, trawl, and pot gear) for the first time and also first began observing in the previously unobserved halibut fishery. The

addition of observers to many vessels in the GOA contributed important data for our understanding of seabird bycatch patterns and quantities.

Further reducing seabird bycatch is quite challenging given the already relatively rare nature of bycatch events. Dietrich and Fitzgerald (2010) found in an analysis of 35,148 Pacific cod demersal longline sets from 2004 to 2007 that the most common species caught as bycatch, the Northern fulmar, only occurred in 2.5 percent of all observed sets. Albatross, a focal species for conservation efforts, occurred in less than 0.1 percent of sets. However, given the vast size of the fishery, the total bycatch can add up to thousands of Northern fulmar or hundreds of albatross.

Fisheries

The three fisheries responsible for the majority of seabird bycatch were demersal longline fisheries. The average annual seabird bycatch for 2011 through 2020 were 4,636 birds per year in the Pacific cod fishery, 639 in the sablefish fishery, and 213 in the halibut fishery. In 2021, the Pacific cod and sablefish demersal longline estimated seabird bycatch was quite reduced when compared to the 2011 through 2020 averages (2,277 and 273 birds, respectively; Table 13). The halibut demersal longline estimated seabird bycatch was higher when compared to the 2011 through 2020 average, however (294; Table 13).

Focusing solely on the bycatch of albatross (unidentified, short-tailed, Laysan, and black-footed), the Pacific cod, sablefish, and halibut fisheries using demersal longline gear average 31, 324, and 74 albatross per year, respectively, for 2011 through 2021 (average for halibut fisheries calculated for 2013 through 2021). Seabird bycatch levels and rates are highly variable among years; however, sablefish has higher estimated albatross bycatch relative to other fisheries. Therefore, future conservation efforts for mitigating albatross bycatch should focus on the sablefish fleet for maximum benefit. For endangered species bycatch, the focus should remain on the Pacific cod fleet; however, the average estimated mortality (2011 through 2021) is about two short-tailed albatross per year. Takes of short-tailed albatross have not been observed in the sablefish fishery since the mid-1990s. The only other fishery with a short-tailed albatross take is the BSAI Greenland turbot fishery in which two short-tailed albatross were recorded taken in 2014 (only one bird was in the observer sample). When expanded by the CAS, the average estimated mortality (2011 through 2021) across the Greenland turbot fishery is less than one short-tailed albatross per year.

As a reminder, the USFWS incidental take statement in the 2021 biological opinion on the groundfish fisheries anticipated the take of no more than six short-tailed albatross in a two-year period (either by demersal longline or trawl; USFWS 2021a). When determining whether this incidental take statement has been exceeded or not, the actual number of birds recorded taken (regardless of whether they are in the observer sample or not) is used, not the number expanded by the CAS.

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Figures

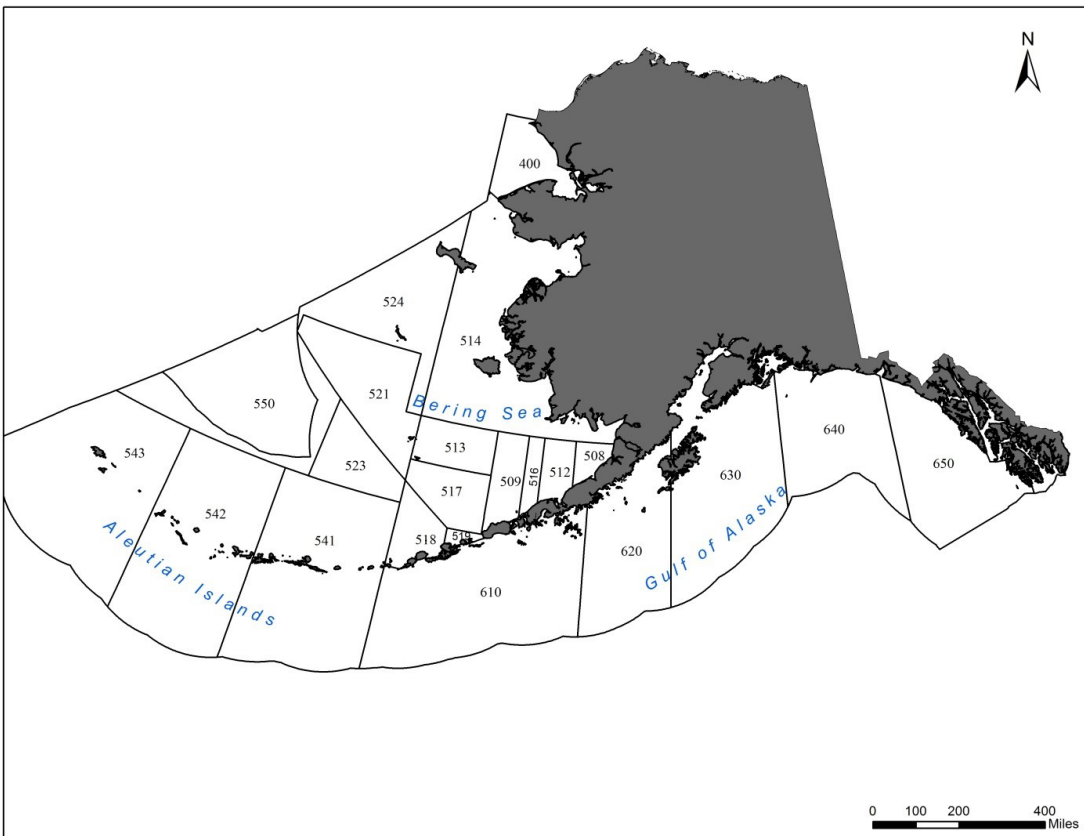


Figure 1 Boundary areas of Bering Sea, Aleutian Islands, and Gulf of Alaska reporting areas. Aleutian Islands includes areas 541 through 543, Bering Sea includes areas north of the Alaska Peninsula, and Gulf of Alaska includes areas south of the Alaska Peninsula.

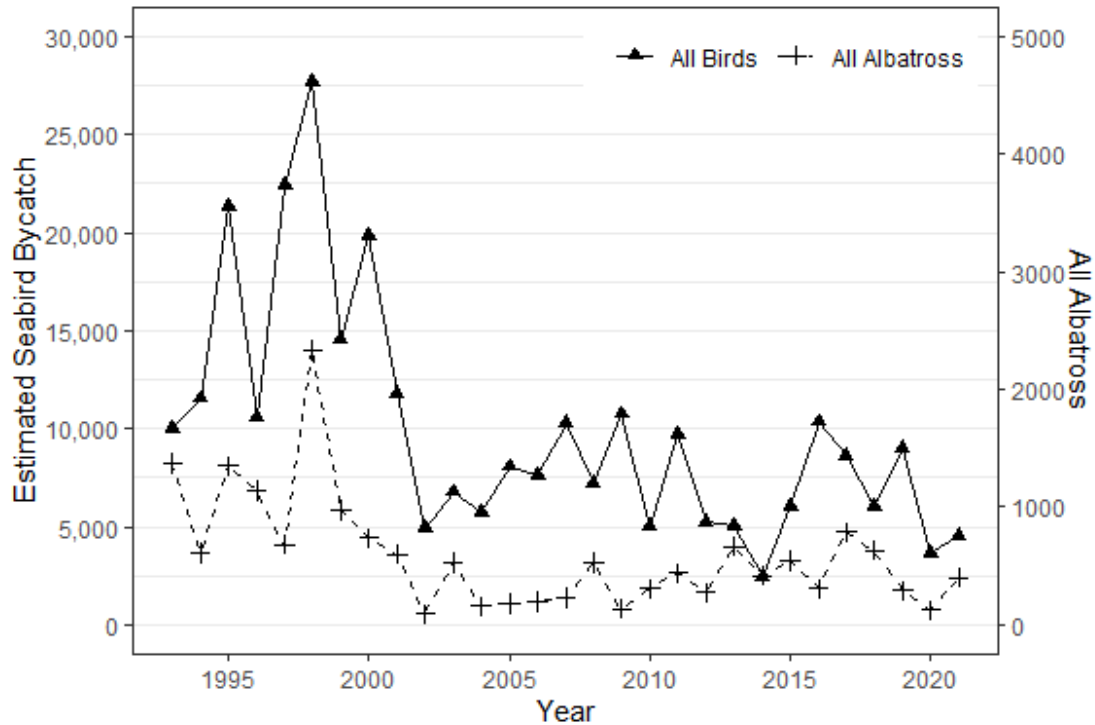


Figure 2 Seabird bycatch in Alaska groundfish fisheries (demersal longline, trawl, and pot) from 1993 through 2021 and halibut fisheries from 2013 through 2021, noting bycatch estimates for all birds (left indices; black triangles) and for albatrosses only (right indices; dashed line). Note the difference in scale. Different data analysis methodologies were used (data from 1993 through 2006 are described in Fitzgerald et al. 2008; data from 2007 through 2021 are from the CAS). The Observer Program was restructured for deployments beginning in 2013 where most CPs had 100 percent coverage, most CVs (over 40 feet length overall) were randomly selected, and the Pacific halibut fleet was incorporated into the program.

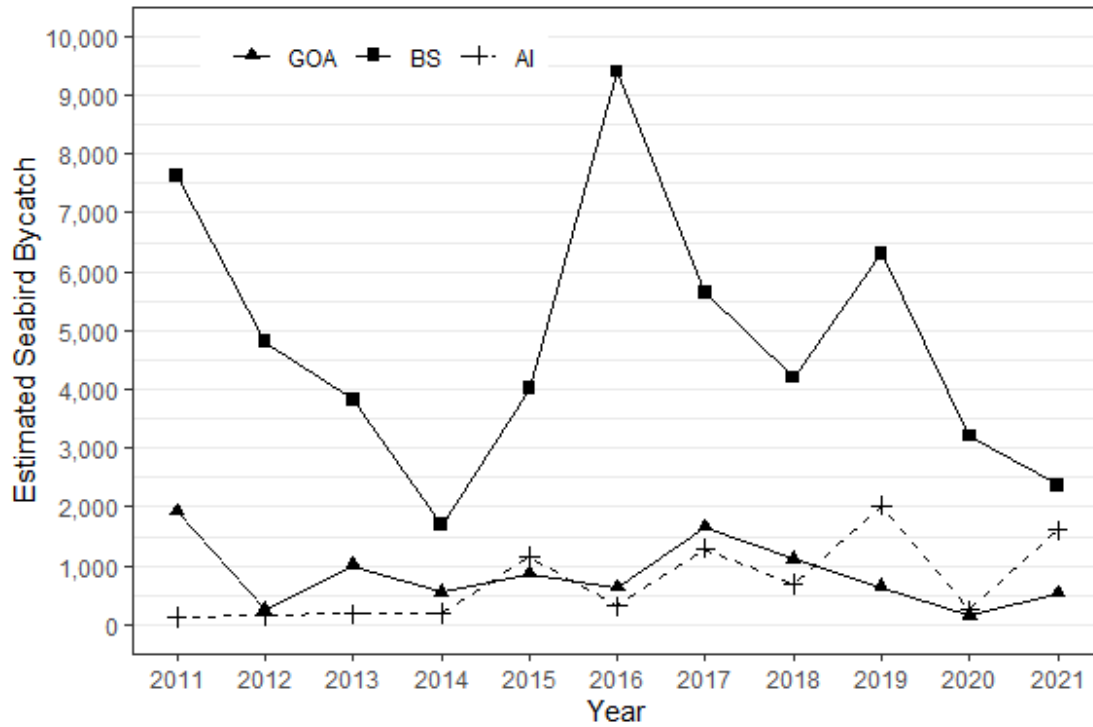


Figure 3 Estimated seabird bycatch in Alaska groundfish fisheries from 2010 through 2021 and halibut fisheries from 2013 through 2021, separated by region (Aleutian Islands [AI], Bering Sea [BS], and Gulf of Alaska [GOA]).

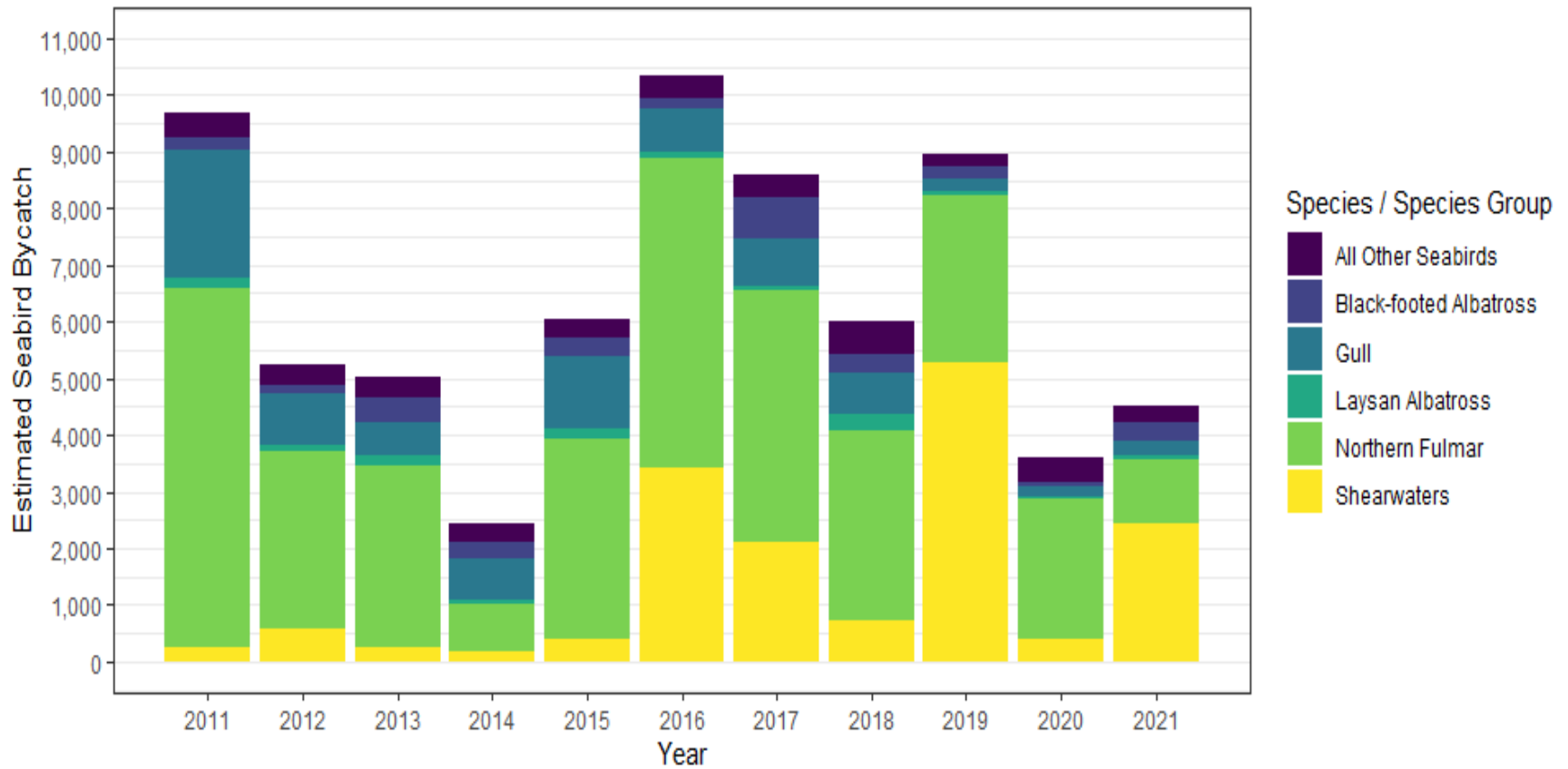


Figure 4 Estimated proportions of species / species groups of seabird bycatch in Alaska groundfish fisheries from 2011 through 2021 and halibut fisheries from 2013 through 2021. 'All Other Seabirds' includes unidentified albatross, short-tailed albatross, storm Petrels, kittiwake, murre, puffin, auklets, other alcid, cormorant, and other birds.

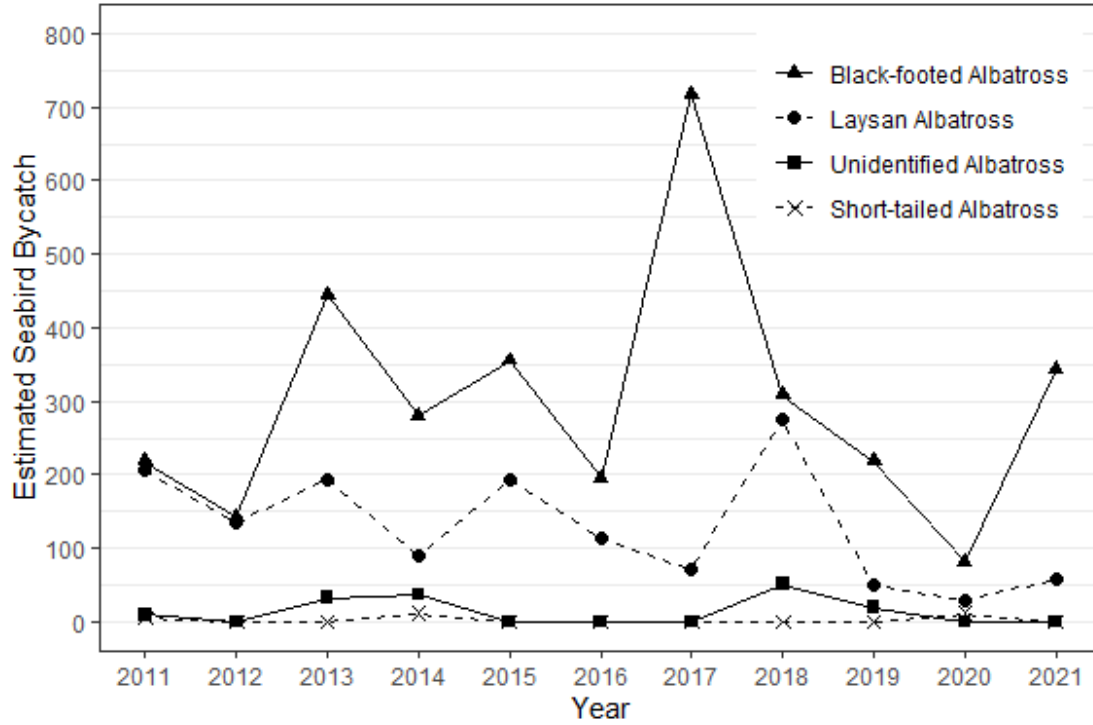


Figure 5 Estimated albatross bycatch in Alaska groundfish fisheries from 2011 through 2021 and halibut fisheries from 2013 through 2021. Black-footed albatross denoted by triangles, Laysan albatross by dashed line and circles, unidentified albatross by squares, and short-tailed albatross by a dashed line and Xs.

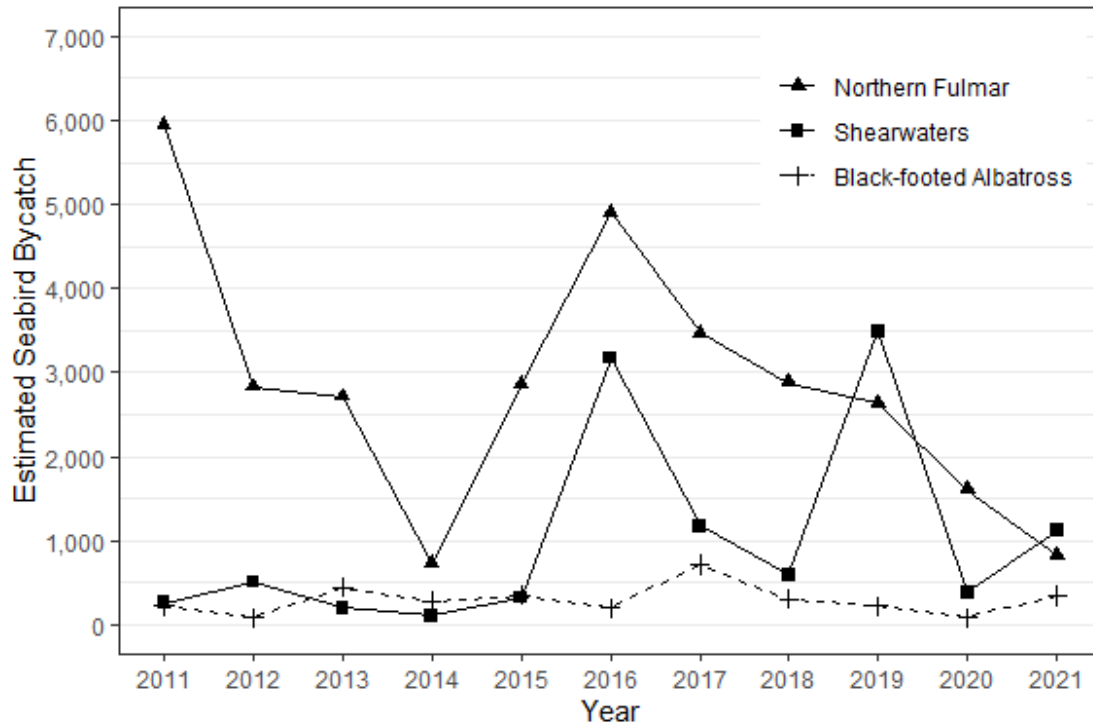


Figure 6 Estimated seabird bycatch of Northern fulmar, shearwaters, and black-footed albatross in Alaska demersal longline groundfish fisheries from 2011 through 2021 and halibut fisheries from 2013 through 2021 all fishery management plan areas combined.

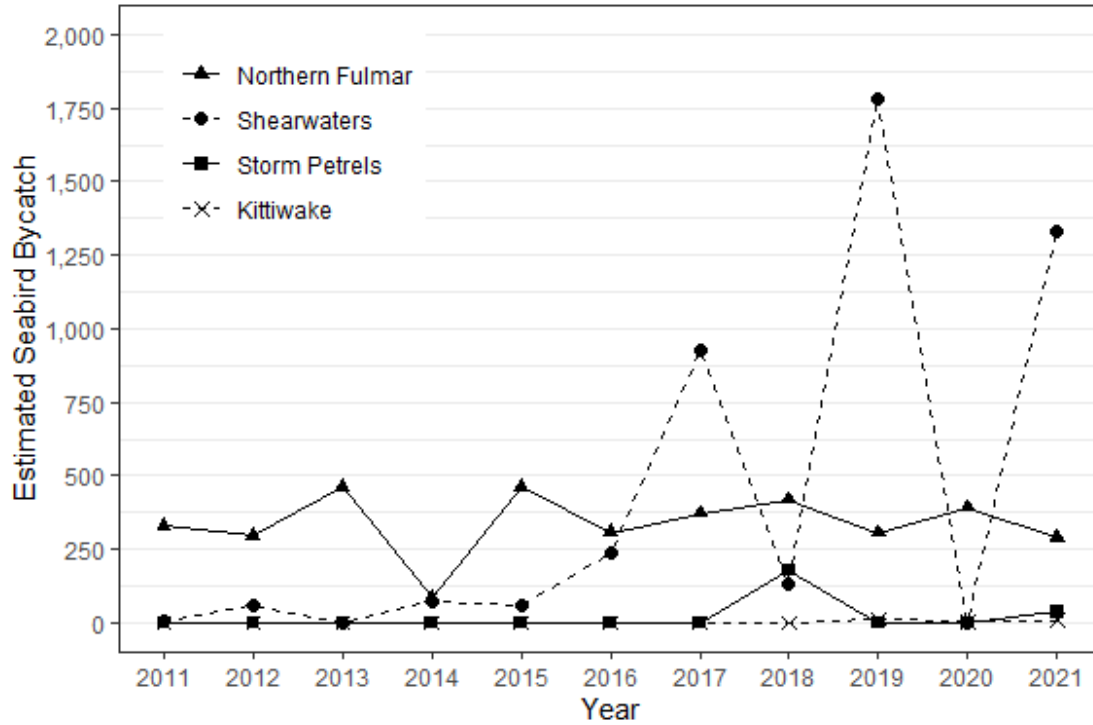


Figure 7 Estimated seabird bycatch of Northern fulmar, shearwaters, storm Petrels, and kittiwake in Alaska trawl fisheries, all fishery management plan areas combined, from 2011 through 2021.

Tables

Table 1 Species and species group categories used in this 2021 annual report and the individual species included in the grouping (adapted from Fitzgerald 2011a).

Species/ Species Group	Includes	Classification
Short-tailed Albatross	n/a	<i>Phoebastria albatrus</i>
Laysan Albatross	n/a	<i>Phoebastria immutabilis</i>
Black-footed Albatross	n/a	<i>Phoebastria nigripes</i>
Unidentified Albatross	Short-tailed, Laysan, or black-footed	n/a
Northern Fulmar	n/a	<i>Fulmarus glacialis</i>
Shearwaters	Unidentified shearwater Sooty shearwater Short-tailed shearwater Unidentified dark shearwater Unidentified procellariid	<i>Ardenna</i> or <i>Puffinus</i> spp. <i>Ardenna grisea</i> <i>Ardenna tenuirostris</i> <i>A. grisea</i> or <i>A. tenuirostris</i> <i>Procellariiformes</i>
Storm Petrel	Unidentified storm petrel Fork-tailed storm petrel Leach’s storm petrel	<i>Oceanodroma</i> spp. <i>O. furcata</i> <i>O. leucorhoa</i>
Gull	Unidentified gull Herring gull Glaucous gull Glaucous-winged gull Slaty-backed gull Gull hybrid	Family <i>Laridae</i> <i>Larus argentatus</i> <i>Larus hyperboreus</i> <i>Larus glaucescens</i> <i>Larus schistisagus</i> Family <i>Laridae</i>
Kittiwake	Black-footed kittiwake Red-legged kittiwake	<i>Rissa tridactyla</i> <i>Rissa brevirostris</i>
Murre	Unidentified murre Thick-billed murre Common murre	<i>Uria</i> spp. <i>Uria lomvia</i> <i>Uria aalge</i>
Puffin	Unidentified puffin Horned puffin Tufted puffin Rhinoceros auklet	<i>Fratercula</i> spp. <i>F. corniculata</i> <i>F. cirrhata</i> <i>Cerorhinca monocerata</i>
Auklet	Unidentified murrelet or auklet murrelet Auklet	Several genera <i>Brachyramphus</i> spp. <i>Aethia</i> spp. and others
Other Alcid	Unidentified alcid Guillemot, unidentified	<i>Alcidae</i> <i>Cepphus</i> spp.
Cormorant	Unidentified cormorant Pelagic cormorant Red-faced cormorant	Family <i>Phalacrocoracidae</i> <i>Phalacrocorax pelagicus</i> <i>Phalacrocorax urile</i>
Other Birds	Miscellaneous birds – could include: Loon Grebe Seaduck Jaeger/skua Tern	Family <i>Gaviidae</i> Family <i>Podicipedidae</i> Family <i>Anatidae</i> Family <i>Stercorariidae</i> Family <i>Sternidae</i>
Unidentified Seabird	All of the above	

Table 2 Total estimated seabird bycatch in Alaska groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021, all gear types and fishery management plan areas combined.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Unidentified Albatross	9	0	32	37	0	0	0	51	19	0	0	13
Short-tailed Albatross	5	0	0	11	0	0	0	0	0	11	0	2
Laysan Albatross	205	134	192	90	193	113	72	276	51	29	57	128
Black-footed Albatross	218	142	444	280	355	195	717	308	218	81	343	300
Northern Fulmar	6,310	3,126	3,195	823	3,530	5,453	4,439	3,356	2,972	2,482	1,120	3,346
Shearwaters	263	567	253	176	386	3,413	2,101	726	5,273	386	2,447	1,454
Storm Petrels	0	0	0	0	0	0	0	177	0	0	36	19
Gull	2,258	896	587	740	1,261	764	855	753	218	202	262	800
Kittiwake	6	5	3	4	12	5	22	37	18	24	13	14
Murre	14	6	3	47	0	58	10	0	0	6	8	14
Puffin	0	0	0	0	0	10	0	0	0	0	0	1
Auklets	0	7	4	107	69	29	36	102	0	0	0	32
Other Alcid	0	0	0	38	0	0	0	6	6	0	0	5
Cormorant	0	0	0	0	30	0	0	0	0	0	0	3
Other Birds	0	0	0	0	0	0	63	0	0	7	0	6
Unidentified Birds	388	341	297	78	193	301	292	222	193	386	222	265
Grand Total	9,678	5,225	5,010	2,431	6,028	10,342	8,608	6,015	8,969	3,616	4,509	6,403

Table 3 Summary of estimated seabird bycatch in the Alaska demersal longline groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021, for all fishery management plan areas combined.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Unidentified Albatross	9	0	32	37	0	0	0	51	19	0	0	13
Short-tailed Albatross	5	0	0	11	0	0	0	0	0	11	0	2
Laysan Albatross	205	134	192	90	193	113	72	196	48	21	57	120
Black-footed Albatross	218	82	444	280	355	195	717	308	218	81	343	295
Northern Fulmar	5,945	2,829	2,712	727	2,870	4,913	3,475	2,883	2,633	1,607	829	2,857
Shearwaters	260	511	196	104	324	3,175	1,173	594	3,492	385	1,116	1,030
Gull	2,257	896	584	740	1,261	761	855	752	218	202	262	799
Kittiwake	6	5	3	4	12	5	22	37	5	21	6	12
Murre	0	6	0	0	0	0	9	0	0	6	8	3
Puffin	0	0	0	0	0	10	0	0	0	0	0	1
Auklets	0	7	0	6	11	0	0	0	0	0	0	2
Other Alcid	0	0	0	0	0	0	0	6	0	0	0	1
Cormorant	0	0	0	0	27	0	0	0	0	0	0	2
Other Birds	0	0	0	0	0	0	0	0	0	7	0	1
Unidentified Birds	388	321	297	78	187	295	292	222	190	386	222	262
Grand Total	9,294	4,792	4,459	2,077	5,240	9,467	6,616	5,049	6,825	2,729	2,843	5,399

Table 4 Estimated seabird bycatch in the Aleutian Islands area demersal longline groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Unidentified Albatross	0	0	0	24	0	0	0	0	0	0	0	2
Laysan Albatross	12	71	102	43	123	52	14	58	0	0	0	43
Black-footed Albatross	5	0	9	9	16	0	0	0	0	0	0	4
Northern Fulmar	21	7	31	56	869	17	165	2	7	2	17	108
Shearwaters	41	15	0	57	19	0	128	0	260	1	188	65
Gull	22	12	23	0	35	4	0	0	5	5	36	13
Unidentified Birds	0	0	11	0	0	0	10	5	0	0	39	6
Grand Total	101	105	176	189	1,061	73	317	65	272	8	281	241

Table 5 Estimated seabird bycatch in the Bering Sea area demersal longline groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Unidentified Albatross	0	0	0	13	0	0	0	0	0	0	0	1
Short-tailed Albatross	5	0	0	11	0	0	0	0	0	11	0	2
Laysan Albatross	29	47	21	16	30	17	33	112	11	0	37	32
Black-footed Albatross	2	0	1	9	2	0	0	0	0	0	0	1
Northern Fulmar	5,105	2,803	2,565	640	1,916	4,792	2,979	2,739	2,527	1,605	778	2,586
Shearwaters	157	496	196	47	301	3,156	997	547	3,193	376	928	945
Gull	1,651	833	419	584	941	602	373	511	157	176	157	582
Kittiwake	6	5	3	4	12	5	22	37	5	21	6	12
Murre	0	6	0	0	0	0	9	0	0	6	8	3
Puffin	0	0	0	0	0	10	0	0	0	0	0	1
Auklets	0	7	0	0	0	0	0	0	0	0	0	1
Other Alcid	0	0	0	0	0	0	0	6	0	0	0	1
Other Birds	0	0	0	0	0	0	0	0	0	7	0	1
Unidentified Birds	378	288	278	78	154	277	268	78	190	369	173	230
Grand Total	7,332	4,485	3,482	1,402	3,355	8,860	4,682	4,030	6,083	2,572	2,086	4,397

Table 6 Estimated seabird bycatch in the Gulf of Alaska area demersal longline groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021.

Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Unidentified Albatross	9	0	32	0	0	0	0	51	19	0	0	10
Laysan Albatross	164	17	69	31	40	43	25	26	38	21	21	45
Black-footed Albatross	212	82	435	262	337	195	717	308	218	81	343	290
Northern Fulmar	819	19	117	31	86	104	330	142	100	0	34	162
Shearwaters	62	0	0	0	5	19	48	46	39	8	0	21
Gull	585	51	142	156	285	154	482	241	56	22	69	204
Auklets	0	0	0	6	11	0	0	0	0	0	0	2
Cormorant	0	0	0	0	27	0	0	0	0	0	0	2
Unidentified Birds	9	33	7	0	34	18	14	140	0	17	10	26
Grand Total	1,860	202	801	486	824	534	1,617	953	470	150	476	761

Table 7 Estimated seabird bycatch in Alaska demersal longline groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021, by catcher/processors (CP) and catcher vessels (CV).

Region	Harvest Sector	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.	
BSAI	CP	Unidentified Albatross	0	0	0	18	0	0	0	0	0	0	0	2	
		Short-tailed Albatross	5	0	0	11	0	0	0	0	0	0	11	0	2
		Laysan Albatross	38	83	71	27	71	39	9	41	11	0	0	37	39
		Black-footed Albatross	4	0	9	0	6	0	0	0	0	0	0	0	2
		Northern Fulmar	5,102	2,804	2,570	647	2,704	4,739	2,676	2,738	2,498	1,593	777	777	2,623
		Shearwaters	174	510	195	53	305	3,156	1,082	547	3,435	369	1,113	1,113	994
		Gull	1,658	835	424	577	949	589	373	504	161	179	142	142	581
		Kittiwake	6	5	3	4	12	5	22	37	5	21	6	6	12
		Murre	0	6	0	0	0	0	9	0	0	0	6	8	3
		Puffin	0	0	0	0	0	10	0	0	0	0	0	0	1
		Auklets	0	7	0	0	0	0	0	0	0	0	0	0	1
		Other Alcid	0	0	0	0	0	0	0	6	0	0	0	0	1
		Other Birds	0	0	0	0	0	0	0	0	0	0	7	0	1
	Unidentified Birds	378	288	272	76	153	277	246	82	189	366	148	148	225	
	Total	7,366	4,537	3,545	1,414	4,201	8,816	4,418	3,955	6,299	2,553	2,230	2,230	4,485	
	CV	Unidentified Albatross	0	0	0	18	0	0	0	0	0	0	0	0	2
		Laysan Albatross	3	35	51	33	81	31	38	130	0	0	0	0	37
		Black-footed Albatross	3	0	1	18	12	0	0	0	0	0	0	0	3
		Northern Fulmar	23	6	25	49	80	69	468	3	36	15	18	18	72
Shearwaters		24	1	1	51	14	0	43	1	18	8	3	3	15	
Gull		14	10	18	7	26	17	0	7	1	2	52	52	14	
Unidentified Birds		1	1	17	1	0	0	32	0	1	3	64	64	11	
Total	68	52	114	177	216	117	581	141	56	27	137	137	153		
GOA	CP	Unidentified Albatross	6	0	0	0	0	0	0	0	0	0	0	1	
		Laysan Albatross	79	6	0	8	4	1	0	3	2	6	0	10	
		Black-footed Albatross	2	0	9	7	3	28	31	7	19	0	3	10	
		Northern Fulmar	101	9	6	7	13	20	127	5	15	0	5	28	
		Shearwaters	32	0	0	0	2	0	0	6	0	0	0	4	
		Gull	33	11	18	9	27	14	52	26	22	0	0	19	
		Auklets	0	0	0	4	8	0	0	0	0	0	0	1	
		Cormorant	0	0	0	0	8	0	0	0	0	0	0	1	

Region	Harvest Sector	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
		Unidentified Birds	3	13	5	0	4	0	0	0	0	0	0	2
		Total	258	39	38	35	70	63	210	47	58	6	8	76
	CV	Unidentified Albatross	3	0	32	0	0	0	0	51	19	0	0	10
		Laysan Albatross	85	11	69	23	36	43	25	22	35	15	21	35
		Black-footed Albatross	209	82	426	256	334	167	686	301	199	81	339	280
		Northern Fulmar	718	10	110	24	72	84	204	137	85	0	29	134
		Shearwaters	30	0	0	0	2	19	48	40	39	8	0	17
		Gull	552	40	124	146	258	140	430	215	34	22	69	185
		Auklets	0	0	0	2	2	0	0	0	0	0	0	0
		Cormorant	0	0	0	0	20	0	0	0	0	0	0	2
		Unidentified Birds	6	20	2	0	29	18	14	140	0	17	10	23
Total	1,603	163	763	450	754	471	1,406	907	412	144	468	686		

Table 8 Estimated seabird bycatch for Alaska groundfish fisheries using pelagic and non-pelagic trawl gear combined, all fishery management plan areas combined, 2011 through 2021.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Laysan Albatross	0	0	0	0	0	0	0	80	3	8	0	8
Black-footed Albatross	0	60	0	0	0	0	0	0	0	0	0	5
Northern Fulmar	329	297	463	85	463	307	372	418	306	391	291	338
Shearwaters	3	56	1	72	62	238	928	132	1,781	1	1,331	419
Storm Petrels	0	0	0	0	0	0	0	177	0	0	36	19
Gull	1	0	3	0	0	3	0	1	0	0	0	1
Kittiwake	0	0	0	0	0	0	0	0	13	3	7	2
Murre	14	0	3	47	0	45	1	0	0	0	0	10
Auklets	0	0	4	66	0	0	0	102	0	0	0	16
Other Alcid	0	0	0	0	0	0	0	0	6	0	0	1
Cormorant	0	0	0	0	3	0	0	0	0	0	0	0
Other Birds	0	0	0	0	0	0	63	0	0	0	0	6
Unidentified Birds	0	0	0	0	6	6	0	0	3	0	0	1
Grand Total	347	413	474	270	534	599	1,364	910	2,112	403	1,665	827

Table 9 Estimated seabird bycatch for the Alaska groundfish Bering Sea and Aleutian Islands fishery management plan area, pelagic and non-pelagic trawl gear combined, 2011 through 2021.

Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Laysan Albatross	0	0	0	0	0	0	0	80	3	8	0	8
Northern Fulmar	302	297	320	65	463	307	328	251	250	391	232	292
Shearwaters	3	56	1	72	62	238	928	132	1,668	1	1,331	408
Storm Petrels	0	0	0	0	0	0	0	177	0	0	36	19
Gull	1	0	3	0	0	3	0	1	0	0	0	1
Kittiwake	0	0	0	0	0	0	0	0	13	3	7	2
Murre	14	0	3	47	0	45	1	0	0	0	0	10
Auklets	0	0	4	66	0	0	0	102	0	0	0	16
Other Alcid	0	0	0	0	0	0	0	0	6	0	0	1
Cormorant	0	0	0	0	3	0	0	0	0	0	0	0
Other Birds	0	0	0	0	0	0	63	0	0	0	0	6
Unidentified Birds	0	0	0	0	6	6	0	0	3	0	0	1
Grand Total	320	353	331	250	534	599	1,320	743	1,944	403	1,606	764

Table 10 Estimated seabird bycatch for the Alaska groundfish Gulf of Alaska fishery management plan area, pelagic and non-pelagic trawl gear combined, 2011 through 2021.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Black-footed Albatross	0	60	0	0	0	0	0	0	0	0	0	5
Northern Fulmar	27	0	143	20	0	0	44	167	56	0	59	47
Shearwaters	0	0	0	0	0	0	0	0	112	0	0	10
Grand Total	27	60	143	20	0	0	44	167	168	0	59	63

Table 11 Estimated seabird bycatch for the Alaska groundfish pelagic (P) and non-pelagic (N) trawl gear types across all fishery management plan areas, 2011 through 2021.

Species/Species Group		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Laysan Albatross	N	0	0	0	0	0	0	0	80	0	0	0	7
	P	0	0	0	0	0	0	0	0	3	8	0	1
Black-footed Albatross	N	0	60	0	0	0	0	0	0	0	0	0	5
	P	0	0	0	0	0	0	0	0	0	0	0	0
Northern Fulmar	N	115	207	340	34	351	223	263	377	201	295	188	236
	P	214	90	123	51	112	84	109	41	105	96	103	103
Shearwaters	N	0	44	0	69	56	229	928	132	1,770	0	1,324	414
	P	3	12	1	3	6	9	0	0	11	1	7	5
Storm Petrels	N	0	0	0	0	0	0	0	177	0	0	36	19
	P	0	0	0	0	0	0	0	0	0	0	0	0
Gull	N	0	0	0	0	0	0	0	1	0	0	0	0
	P	1	0	3	0	0	3	0	0	0	0	0	1
Kittiwake	N	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	13	3	7	2
Murre	N	0	0	0	44	0	39	0	0	0	0	0	8
	P	14	0	3	3	0	6	1	0	0	0	0	2
Auklets	N	0	0	0	66	0	0	0	102	0	0	0	15
	P	0	0	4	0	0	0	0	0	0	0	0	0
Other Alcid	N	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	6	0	0	1
Cormorant	N	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	3	0	0	0	0	0	0	0
Other Birds	N	0	0	0	0	0	0	63	0	0	0	0	6
	P	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Birds	N	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	6	6	0	0	3	0	0	1
Total	N	115	311	340	213	407	491	1,254	869	1,971	295	1,548	710
	P	232	102	134	57	127	108	110	41	141	108	117	116
Grand Total		347	413	474	270	534	599	1,364	910	2,112	403	1,665	827

Table 12 Estimated seabird bycatch for pot vessels fishing groundfish in Alaska waters, all fishery management plan areas combined, 2011 through 2021.

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Ann Avg.
Northern Fulmar	37	0	20	11	196	234	592	55	33	483	0	151
Shearwaters	0	0	57	0	0	0	0	0	0	0	0	5
Murre	0	0	0	0	0	13	0	0	0	0	0	1
Auklets	0	0	0	35	58	29	36	0	0	0	0	14
Other Alcid	0	0	0	38	0	0	0	0	0	0	0	3
Unidentified Birds	0	20	0	0	0	0	0	0	0	0	0	2
Grand Total	37	20	77	85	254	275	628	55	33	483	0	177

Table 13 Estimated seabird bycatch in Alaska by groundfish fisheries 2011 through 2021 and halibut fisheries 2013 through 2021.

Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.	
BSAI	Demersal Longline	Greenland Turbot	Short-tailed Albatross	0	0	0	6	0	0	0	0	0	0	0	6	1	
			Laysan Albatross	5	0	0	0	0	0	0	1	0	0	0	0	6	1
			Northern Fulmar	498	341	64	54	17	81	130	38	0	1	0	0	1,224	111
			Shearwaters	41	37	60	0	55	173	14	0	11	3	0	0	393	36
			Kittiwake	0	0	0	0	0	0	9	0	0	0	0	0	9	1
			Unidentified Birds	0	14	5	0	0	0	0	0	0	0	0	0	20	2
			Total	544	391	129	61	72	254	153	39	11	4	0	0	1,658	151
		Halibut	Laysan Albatross	0	0	17	0	19	0	38	130	0	0	0	0	203	18
			Black-footed Albatross	0	0	0	18	0	0	0	0	0	0	0	0	18	2
			Northern Fulmar	0	0	0	0	0	69	467	0	23	0	16	0	575	52
			Shearwaters	0	0	0	0	0	0	43	0	0	5	0	0	47	4
			Gull	0	0	14	0	0	17	0	0	0	0	0	51	82	7
			Unidentified Birds	0	0	19	0	0	0	32	0	0	0	0	63	114	10
			Total	0	0	49	18	19	87	579	130	23	5	131	1,039	94	
		Other Species	Northern Fulmar	0	0	0	0	0	0	3	0	0	0	0	0	3	0
			Unidentified Birds	0	0	0	0	3	0	0	0	0	0	0	0	3	0
			Total	0	0	0	0	3	0	3	0	0	0	0	0	6	1
		Pacific Cod	Unidentified Albatross	0	0	0	12	0	0	0	0	0	0	0	0	12	1
			Short-tailed Albatross	5	0	0	5	0	0	0	0	0	11	0	0	21	2
			Laysan Albatross	27	34	4	12	38	12	9	39	11	0	37	0	223	20
			Northern Fulmar	4,607	2,470	2,502	582	2,689	4,658	2,544	2,683	2,511	1,606	779	0	27,630	2,512
			Shearwaters	123	474	135	44	243	2,983	1,069	547	3,442	369	1,116	0	10,546	959
			Gull	1,646	832	413	584	941	589	373	512	162	180	142	0	6,374	579

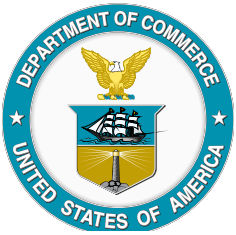
Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.	
			Kittiwake	6	5	3	4	12	5	13	37	5	21	6	118	11	
			Murre	0	6	0	0	0	0	9	0	0	0	6	8	29	3
			Puffin	0	0	0	0	0	0	10	0	0	0	0	0	10	1
			Auklets	0	7	0	0	0	0	0	0	0	0	0	0	7	1
			Other Alcid	0	0	0	0	0	0	0	0	6	0	0	0	6	1
			Other Birds	0	0	0	0	0	0	0	0	0	0	7	0	7	1
			Unidentified Birds	379	274	263	78	151	277	247	82	190	369	149	2,458	223	
			Total	6,792	4,102	3,320	1,321	4,074	8,535	4,264	3,906	6,321	2,571	2,236	47,443	4,313	
		Rock-fish	Gull	0	0	5	0	0	0	0	0	0	0	0	0	5	0
			Total	0	0	5	0	0	0	0	0	1	0	0	0	5	0
		Sablefish	Unidentified Albatross	0	0	0	25	0	0	0	0	0	0	0	0	25	2
			Laysan Albatross	9	84	102	47	96	57	0	1	0	0	0	0	396	36
			Black-footed Albatross	7	0	10	0	18	0	0	0	0	0	0	0	35	3
			Northern Fulmar	21	0	30	60	78	0	0	20	0	0	0	0	209	19
			Shearwaters	34	0	0	60	22	0	0	0	0	0	0	0	117	11
			Gull	27	12	11	0	34	0	0	0	0	0	0	0	84	8
			Unidentified Birds	0	0	3	0	0	0	0	0	0	0	0	0	3	0
			Total	97	96	155	192	249	57	0	21	0	0	0	0	868	79
		Pot	Pacific Cod	Northern Fulmar	0	0	20	11	196	139	580	55	33	475	0	1,509	137
				Murre	0	0	0	0	0	13	0	0	0	0	0	13	1
				Auklets	0	0	0	35	19	29	36	0	0	0	0	119	11
Unidentified Birds	0			20	0	0	0	0	0	0	0	0	0	20	2		
Total	0			20	20	46	216	180	616	55	33	475	0	1,661	151		

Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.		
		Sable-fish	Northern Fulmar	0	0	0	0	0	0	12	0	0	0	0	12	1		
			Total	0	0	0	0	0	0	0	12	0	0	0	0	12	1	
		Alaska Plaice	Northern Fulmar	0	0	0	0	0	0	0	0	0	0	0	10	10	1	
			Total	0	0	0	0	0	0	0	0	0	0	0	0	10	10	1
		Arrowtooth Flounder	Northern Fulmar	0	150	8	0	221	0	0	0	0	0	0	0	379	34	
			Shearwaters	0	0	0	0	0	0	0	0	0	0	0	0	49	49	4
			Total	0	150	8	0	221	0	0	0	0	0	0	0	49	428	39
		Atka Mackerel	Northern Fulmar	29	8	0	0	92	0	0	210	95	195	0	0	629	57	
			Shearwaters	0	44	0	0	0	184	156	132	796	0	1,000	0	2,312	210	
			Storm Petrels	0	0	0	0	0	0	0	160	0	0	0	0	160	15	
			Auklets	0	0	0	0	0	0	0	51	0	0	0	0	51	5	
			Total	29	52	0	0	92	184	156	553	891	195	1,000	0	3,152	287	
		Flathead Sole	Northern Fulmar	0	0	0	0	0	0	0	0	0	0	0	38	38	3	
			Shearwaters	0	0	0	0	0	0	0	0	0	1	0	0	1	0	
			Total	0	0	0	0	0	0	0	0	0	1	0	38	39	4	
		Green-land Turbot	Northern Fulmar	0	0	0	0	0	0	0	0	0	50	0	0	50	5	
			Total	0	0	0	0	0	0	0	0	0	50	0	0	50	5	
		Pacific Cod	Northern Fulmar	0	0	0	0	0	0	57	0	0	0	60	0	117	11	
			Total	0	0	0	0	0	0	57	0	0	0	60	0	117	11	
		Pollock	Laysan Albatross	0	0	0	0	0	0	0	0	0	3	8	0	11	1	
Northern Fulmar			214	90	123	51	112	84	109	41	105	96	103	0	1,129	103		
Shearwaters			3	12	1	3	6	9	0	0	11	1	7	0	53	5		
Gull			1	0	3	0	0	3	0	0	0	0	0	0	7	1		

Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.	
			Kittiwake	0	0	0	0	0	0	0	0	13	3	7	23	2	
			Murre	14	0	3	3	0	6	1	0	0	0	0	27	2	
			Auklets	0	0	4	0	0	0	0	0	0	0	0	4	0	
			Other Alcid	0	0	0	0	0	0	0	0	6	0	0	6	1	
			Cormorant	0	0	0	0	3	0	0	0	0	0	0	3	0	
			Unidentified Birds	0	0	0	0	6	6	0	0	3	0	0	15	1	
			Total	232	102	134	57	127	108	110	41	141	108	117	1,278	116	
		Rock Sole	Northern Fulmar	0	49	112	0	0	92	0	0	0	6	28	286	26	
			Gull	0	0	0	0	0	0	0	1	0	0	0	1	0	
			Auklets	0	0	0	66	0	0	0	0	0	0	0	66	6	
			Other Birds	0	0	0	0	0	0	0	63	0	0	0	63	6	
			Total	0	49	112	66	0	92	63	1	0	6	28	416	38	
		Rockfish	Laysan Albatross	0	0	0	0	0	0	0	80	0	0	0	80	7	
			Northern Fulmar	0	0	0	0	38	0	0	0	0	0	0	38	3	
			Shearwaters	0	0	0	0	0	0	0	772	0	861	0	275	1,908	173
			Storm Petrels	0	0	0	0	0	0	0	0	17	0	0	36	53	5
			Auklets	0	0	0	0	0	0	0	0	51	0	0	0	51	5
		Total	0	0	0	0	38	0	772	148	861	0	311	2,130	194		
		Yellowfin Sole	Northern Fulmar	59	0	77	14	0	74	219	0	0	34	53	531	48	
			Shearwaters	0	0	0	69	56	45	0	0	0	0	0	170	15	
			Murre	0	0	0	44	0	39	0	0	0	0	0	83	8	
			Total	59	0	77	127	56	158	219	0	0	34	53	784	71	
			Laysan Albatross	0	0	0	0	19	0	0	5	4	0	21	49	4	

Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.	
GOA	Demersal Longline	Halibut	Black-footed Albatross	0	0	53	33	0	0	303	76	0	0	82	547	50	
			Northern Fulmar	0	0	0	19	40	60	116	0	20	0	0	256	23	
			Shearwaters	0	0	0	0	0	0	25	39	0	0	0	64	6	
			Gull	0	0	80	98	142	48	30	0	3	0	60	463	42	
			Total	0	0	134	150	201	109	474	120	28	0	163	1,378	125	
		Pacific Cod	Unidentified Albatross	9	0	0	0	0	0	0	0	0	0	0	0	9	1
			Laysan Albatross	0	0	0	8	0	0	0	0	0	0	0	0	8	1
			Black-footed Albatross	0	0	0	8	0	30	34	0	0	0	0	72	7	
			Northern Fulmar	8	19	8	11	11	25	150	13	0	0	22	268	24	
			Shearwaters	0	0	0	0	0	0	0	8	0	0	0	8	1	
			Gull	36	25	27	49	33	17	203	187	35	0	9	621	56	
			Auklets	0	0	0	6	11	0	0	0	0	0	0	17	2	
			Unidentified Birds	0	33	7	0	5	0	0	140	0	0	10	196	18	
		Total	54	76	43	84	60	72	388	347	35	0	41	1,198	109		
		Sablefish	Unidentified Albatross	0	0	32	0	0	0	0	51	19	0	0	102	9	
			Laysan Albatross	164	17	69	23	21	43	25	21	33	21	0	438	40	
			Black-footed Albatross	212	82	381	221	337	165	381	232	218	81	261	2,571	234	
			Northern Fulmar	811	0	108	0	35	18	64	129	80	0	12	1,257	114	
			Shearwaters	62	0	0	0	5	19	23	0	39	8	0	157	14	
			Gull	549	27	34	8	111	89	249	54	18	22	0	1,160	105	
Cormorant	0		0	0	0	27	0	0	0	0	0	0	27	2			
Unidentified Birds	9		0	0	0	28	18	14	0	0	17	0	86	8			
Total	1,807		125	624	252	564	353	755	487	408	150	273	5,796	527			
		Northern Fulmar	37	0	0	0	0	95	0	0	0	0	132	12			

Region	Gear	Target	Species/ Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Grand Total	Ann Avg.	
	Pot	Pacific Cod	Shearwaters	0	0	57	0	0	0	0	0	0	0	0	57	5	
			Auklets	0	0	0	0	38	0	0	0	0	0	0	0	38	3
			Other Alcid	0	0	0	38	0	0	0	0	0	0	0	0	38	3
			Total	37	0	57	38	38	95	0	0	0	0	0	0	265	24
		Sable-fish	Northern Fulmar	0	0	0	0	0	0	0	0	0	0	9	0	9	1
			Total	0	0	0	0	0	0	0	0	0	0	9	0	9	1
	Trawl	Arrow-tooth Flounder	Northern Fulmar	0	0	143	0	0	0	0	0	104	0	0	0	247	22
			Total	0	0	143	0	0	0	0	104	0	0	0	0	247	22
		Rockfish	Black-footed Albatross	0	60	0	0	0	0	0	0	0	0	0	0	60	5
			Northern Fulmar	27	0	0	20	0	0	44	63	56	0	59	0	269	24
			Shearwaters	0	0	0	0	0	0	0	0	0	112	0	0	112	10
			Total	27	60	0	20	0	0	44	63	168	0	59	0	441	40



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