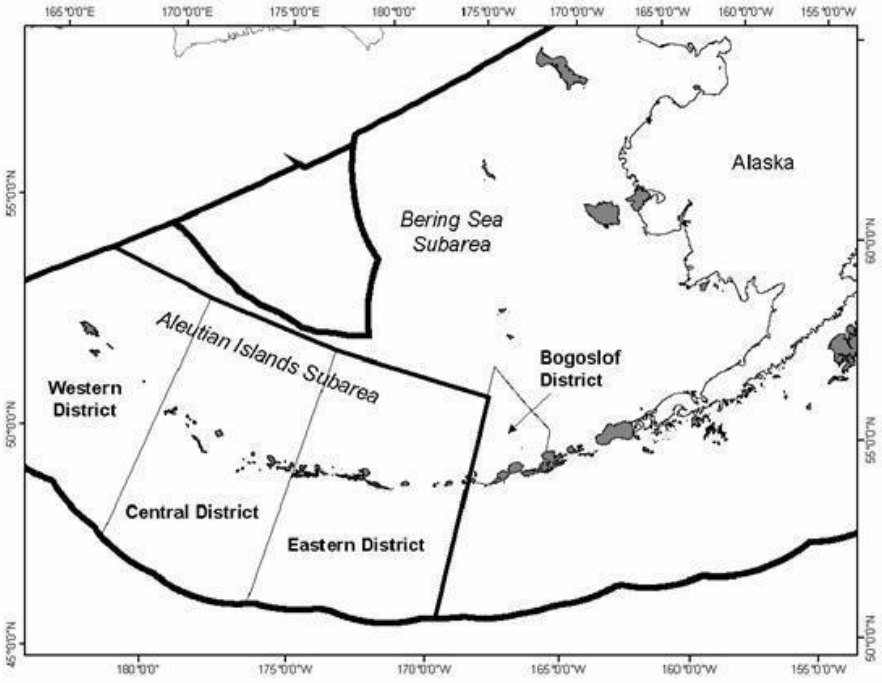
STOCK ASSESSMENT AND FISHERY EVALUATION REPORT

FOR THE GROUNDFISH RESOURCES

OF THE BERING SEA/ALEUTIAN ISLANDS REGIONS

Compiled by:

The Plan Team for the Groundfish Fisheries
of the Bering Sea and Aleutian Islands



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Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Region

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Summary

By

The Plan Team for the Groundfish Fisheries of the Bering Sea and Aleutian Islands

Introduction

The *National Standard Guidelines for Fishery Management Plans* published by the National Marine Fisheries Service (NMFS) require that a stock assessment and fishery evaluation (SAFE) report be prepared and reviewed annually for each fishery management plan (FMP). The SAFE report summarizes the best available scientific information concerning the past, present, and possible future condition of the stocks, marine ecosystems, and fisheries that are managed under Federal regulation. It provides information to the Councils for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. For the FMP for the Groundfish Fishery of the Bering Sea and Aleutian Islands (BSAI) Area, the SAFE report is published in three sections: a "Stock Assessment" section, which comprises the bulk of this document, and "Economic Status of Groundfish Fisheries off Alaska" and "Ecosystem Considerations" sections, which are bound separately.

The BSAI Groundfish FMP requires that a draft of the SAFE Report be produced each year in time for the December meeting of the North Pacific Fishery Management Council. Each stock or stock complex is represented in the SAFE Report by a chapter containing the latest stock assessment. New or revised stock assessment models are usually previewed at the September Plan Team meeting, and considered again by the Team at its November meeting for recommending final specifications for the following two fishing years. This process is repeated annually.

Normally, full stock assessments are required for walleye pollock, Pacific cod, Atka mackerel, sablefish, and some flatfish stocks every year; while all rockfishes, some flatfishes, sharks, skates, octopus, squid, and sculpins require full stock assessment only during years in which the Aleutian Island bottom trawl survey is conducted (typically even-numbered years). However, a lapse in appropriations resulted in the Federal government being shut down during most of October this year, which in turn resulted in several modifications to the typical procedure (described further under "Stock Status Summaries," below).

This Stock Assessment section of the SAFE report for the BSAI groundfish fisheries is compiled by the BSAI Groundfish Plan Team from chapters contributed by scientists at NMFS Alaska Fisheries Science Center (AFSC). These chapters include a recommendation by the author(s) for overfishing level (OFL) and acceptable biological catch (ABC) for each stock and stock complex managed under the FMP for the next two fishing years. This introductory section includes the recommendations of the Team (Table 1), along with a summary of each chapter, including the Ecosystems Considerations chapter and the Economic SAFE Report.

The OFL and ABC recommendations by the Plan Team are reviewed by the Scientific and Statistical Committee (SSC), which may confirm the Team recommendations. The Team and SSC recommendations, together with social and economic factors, are considered by the Council in determining total allowable catches (TACs) and other measures used to manage the fisheries. Neither the author(s), Team, nor SSC recommends TACs.

Members of the BSAI Groundfish Plan Team who compiled this SAFE report were: Mike Sigler (co-chair), Grant Thompson (co- chair), Jane DiCosimo (BSAI Groundfish FMP coordinator), Kerim Aydin,

David Barnard, Liz Chilton, Bill Clark, Lowell Fritz, Mary Furuness, Dana Hanselman, Alan Haynie, Brenda Norcross, Chris Siddon, and Leslie Slater.

Background Information

The BSAI management area lies within the 200-mile U.S. Exclusive Economic Zone (EEZ) of the US (Figure 1). International North Pacific Fisheries Commission (INPFC) statistical areas 1 and 2 comprise the EBS. The Aleutian Islands (AI) region is INPFC Area 5.

Amendment 95 to the BSAI Groundfish FMP, which was implemented in 2010 for the start of the 2011 fishing year, defined three categories of species or species groups that are likely to be taken in the groundfish fishery. Species may be split or combined within the "target species" category according to procedures set forth in the FMP. The three categories of finfishes and invertebrates that have been designated for management purposes under two management classifications are listed below.

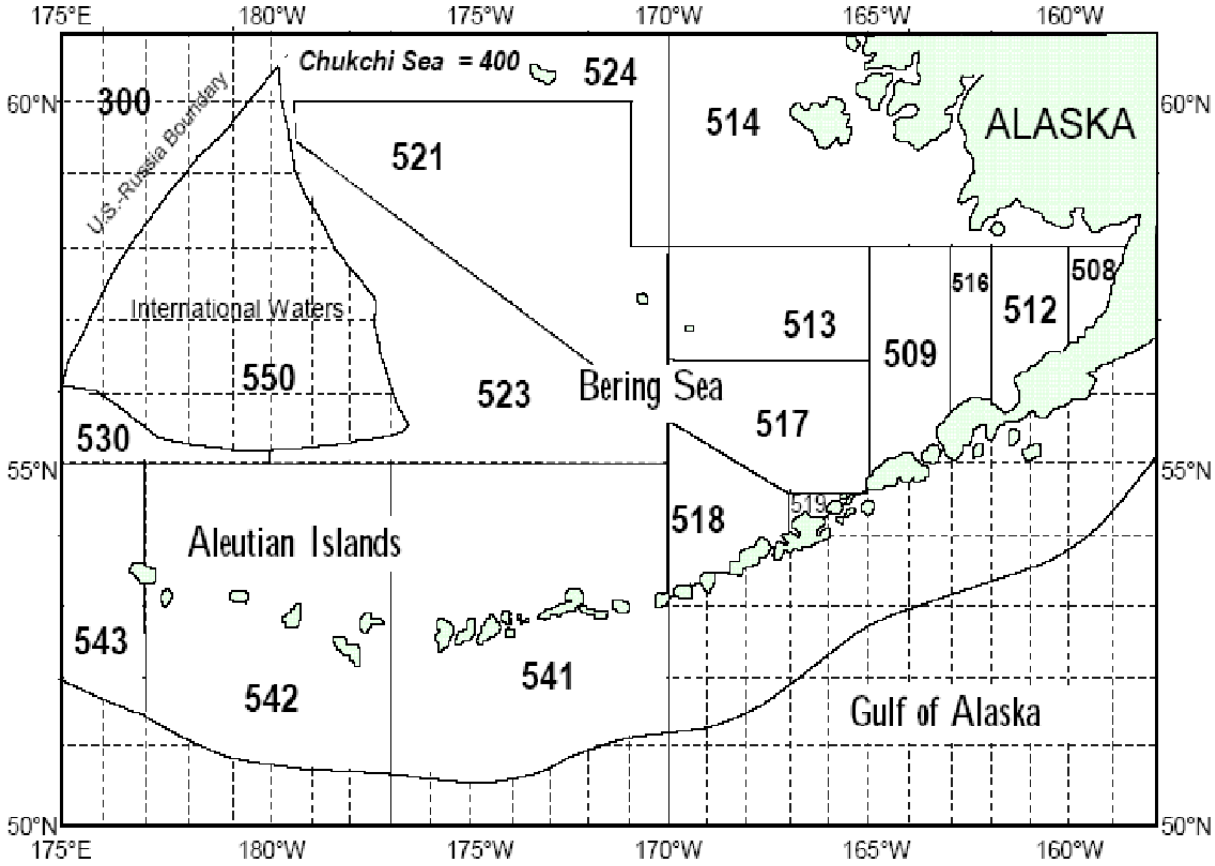

Figure 1. Bering Sea/Aleutian Islands statistical and reporting areas.

In the Fishery:

Target species–are those species that support either a single species or mixed species target fishery, are commercially important, and for which a sufficient data base exists that allows each to be managed on its own biological merits. Accordingly, a specific TAC is established annually for each target species or species assemblage. Catch of each species must be recorded and reported. Stocks/assemblages in the target category are listed below.

Ecosystem Component:

Prohibited Species–are those species and species groups the catch of which must be avoided while fishing for groundfish, and which must be immediately returned to sea with a minimum of injury except when their retention is authorized by other applicable law. Groundfish species and species groups under the FMP for which the quotas have been achieved shall be treated in the same manner as prohibited species.

Forage fish species–are those species listed below, which are a critical food source for many marine mammal, seabird and fish species. The forage fish species category is established to allow for the management of these species in a manner that prevents the development of a commercial directed fishery for forage fish. Management measures for this species category will be specified in regulations and may include such measures as prohibitions on directed fishing, limitations on allowable bycatch retention amounts, or limitations on the sale, barter, trade or any other commercial exchange, as well as the processing of forage fish in a commercial processing facility.

In the Fishery	Ecosystem Component	
Target Species1	Prohibited Species2	Forage Fish Species3
Walleye pollock	Pacific halibut	Osmeridae family (eulachon, capelin, and other smelts)
Pacific cod	Pacific herring	Myctophidae family (lanternfishes)
Sablefish	Pacific salmon	Bathylagidae family (deep-sea smelts)
Yellowfin sole	Steelhead trout	Ammodytidae family (Pacific sand lance)
Greenland turbot	King crab	Trichodontidae family (Pacific sand fish)
Arrowtooth flounder	Tanner crab	Pholidae family (gunnels)
Kamchatka flounder		Stichaeidae family
Northern rock sole		(prickleb acks, warbonnets, eelblennys, cockscombs, shannys)
Flathead sole		Gonostomatidae family
Other flatfish assemblage		(bristlemouths, lightfishes, and anglemouths)
Alaska plaice		Order Euphausiacea (krill)
Pacific ocean perch		
Northern rockfish		
Shortraker rockfish		
Blackspotted/Rougheye rockfish assemblage		
Other rockfish assemblage		
Atka mackerel		
Skate assemblage		
Sculpin assemblage		
Shark assemblage		
Squid assemblage		
Octopus assemblage		

C[1]

TAC for each listing. Species and species groups may or may not be targets of directed fisheries.

[2] Must be immediately returned to the sea, except when retention is required or authorized.

[3] Management measures for forage fish are established in regulations implementing the FMP.

Historical Catch Statistics

Catch statistics since 1954 are shown for the Eastern Bering Sea (EBS) subarea in Table 2. The initial target species in the BSAI commercial fisheries was yellowfin sole. During this period, total catches of groundfish peaked at 674,000 t in 1961. Following a decline in abundance of yellowfin sole, other species (principally walleye pollock) were targeted, and total catches peaked at 2.2 million t in 1972. Pollock is now the principal fishery, with catches peaking at approximately 1.4-1.5 million t due to years of high recruitment. After the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) was adopted in 1976, catch restrictions and other management measures were placed on the fishery and total groundfish catches have since varied from one to two million t. In 2005, Congress implemented a statutory cap on TACs for BSAI groundfish of 2 million t, which had previously been a policy adopted by

the Council. Total groundfish catches generally are well below the 2 million t optimal yield (OY) cap. Total groundfish catches in the EBS in 2012 totaled 1,754,681 t; catches through November 9, 2013 totaled 1,786,661 t. Pollock catches in the EBS totaled 1,205,338 t in 2012; catches through November 9, 2013 totaled 1,268,019 t.

Catches in the Aleutian Islands (AI) subarea always are much less than in the EBS (Table 3). Total AI catches peaked at 190,750 t in 1996. Total AI catches were 144,684 t in 2010, and dropped to 96,358 t and 98,601 t in 2011 and 2012. Total catch of 79,916 t through November 9, 2013 is the lowest since 1988.

The predominance of target species in the AI has changed over the years. Pacific ocean perch (POP) was the initial target species. As POP abundance declined, the fishery diversified to target different species. POP was the second largest fishery at 18,403 t in 2011 and 18,554 t in 2012; catch totaled 26,342 through November 9, 2013. Pacific ocean perch displaced Pacific cod as the second largest fishery beginning in 2011, as Pacific cod catch dropped from 25,164 t in 2010 to 12,991 t in 2012 as a result of Steller sea lion protection measures; catch is 8,720 t through November 9, 2013. Pacific ocean perch had the highest catches of all AI groundfish through November 9, 2013 at 26,342 t. Atka mackerel was the largest fishery in the AI at 50,600 t in 2011 and 46,8659 t in 2012 (down from 68,496 t in 2010); catch was 23,034 t through November 9, 2013. Atka mackerel harvest also dropped as a result of Steller sea lion protection measures and a shift in its biomass distribution; the 2013 catch of 23,034 t was less than 50% of 2012 catch of 46,859 t.

Total catches since 1954 for the BSAI, combined, are in Table 4. Total BSAI catches were 1,351,354 t in 2010 (81 percent of the total TAC and 68 percent of the OY). Combined BSAI catches rose to 1,817,947 t in 2011 (91 percent of total TACs (which equaled the OY)) and 1,853,462 t (93 percent of OY) in 2012. BSAI catches through November 9, 2013 totaled 1,866,544 t, which equaled 93% of OY. The relationship of the various biological reference points (biomass, OFL, ABC, TAC, and catch) is depicted in Figure 2.

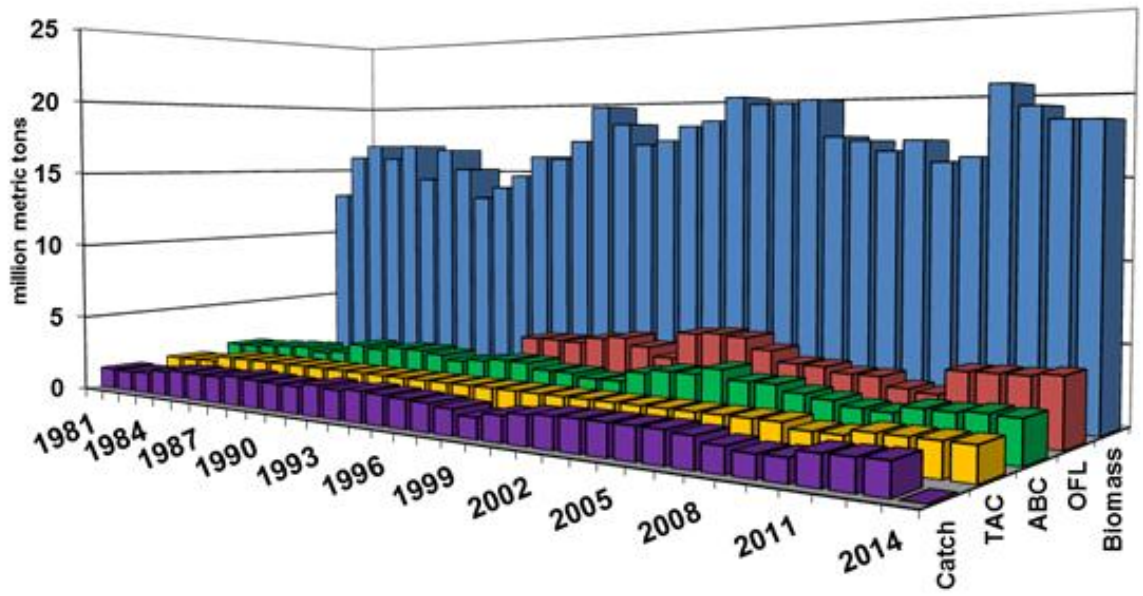

Figure 2. Biomass, Overfishing Level, Acceptable Biological Catch, and Total Allowable Catch for 1981-2014* and Catch, 1981-2013.
*2014, as recommended by the Plan Team and assuming total TACs = OY

Recent Total Allowable Catches

Amendment 1 to the BSAI Groundfish FMP provided the framework to manage the groundfish resources as a complex. Maximum sustainable yield (MSY) for the BSAI groundfish complex was estimated at 1.8 to 2.4 million t. The OY range was set at 85 percent of the MSY range, or 1.4 to 2.0 million t. The sum of the TACs equals OY for the groundfish com-

plex, which is constrained by the 2.0 million t cap on OY. Recent total TACs have been set equal to the OY cap, as biomasses of pollock and Pacific cod increased.

Establishment of the Western Alaska Community Development Quota (CDQ) Program annual groundfish reserves is concurrent with the annual BSAI groundfish harvest specifications. Once annual BSAI groundfish TACs are established, the CDQ Program is allocated set portions of the TACs for certain species and species assemblages. This includes 10 percent of the BS and AI pollock TACs, 20 percent of the fixed gear sablefish TAC, and 7.5 percent of the sablefish trawl gear allocation. It also receives 10.7 percent of the TACs (up from 7.5 percent prior to 2008) for Pacific cod, yellowfin sole, rock sole, flathead sole, Atka mackerel, AI Pacific ocean perch, arrowtooth flounder, and BS Greenland turbot. The program also receives allocations of PSC limits.

The TAC specifications for the primary allocated species, and PSC limit specifications, are recommended by the Council at its December meetings. Beginning with the 2014 fishery, the Pacific cod total BSAI TAC will be reduced by 6 percent from the ABC to account for each of the State of Alaska's guideline harvest levels of 3 percent of the BSAI ABC for the two State water fisheries, one in the Bering Sea and one in the Aleutian Islands.

For the non-specified reserve, 15 percent of the TAC for each target species, except for pollock, the hook-and-line and pot gear allocation of sablefish, and the Amendment 80 species (Pacific cod, Atka mackerel, flathead sole, rock sole, yellowfin sole, and Aleutian Islands Pacific ocean perch), are placed in a non-specified reserve. Apportionments to this reserve range from 4.3 to 15 percent of applicable TAC limits. The reserve is used to (1) correct operational problems in the fishing fleets, (2) promote full and efficient use of groundfish resources, (3) adjust species TACs according to changing conditions of stocks during fishing year, and (4) make apportionments and Community Development Quota allocations. The initial TAC (ITAC) for each species is the remainder of the TAC after the subtraction of the reserve.

Biological Reference Points

A number of biological reference points are used in this SAFE report. Among these are the fishing mortality rate (F) and stock biomass level (B) associated with MSY (F_{MSY} and B_{MSY}, respectively), and the fishing mortality rates that reduce the level of spawning biomass per recruit to some percentage of the pristine level ($F_{P\%}$). The fishing mortality rate used to compute ABC is designated F_{ABC}, and the fishing mortality rate used to compute the OFL is designated F_{OFL}.

Definition of Acceptable Biological Catch and the Overfishing Level

Amendment 56 to the BSAI Groundfish FMP, which was implemented in 1999, defines ABC and OFL for the BSAI groundfish fisheries. The definitions are shown below, where the fishing mortality rate is denoted *F*, stock biomass (or spawning stock biomass, as appropriate) is denoted *B*, and the *F* and *B* levels corresponding to MSY are denoted F_{MSY} and B_{MSY} respectively.

Acceptable Biological Catch is a preliminary description of the acceptable harvest (or range of harvests) for a given stock or complex. Its derivation focuses on the status and dynamics of the stock, environmental conditions, other ecological factors, and prevailing technological characteristics of the fishery. The fishing mortality rate used to calculate ABC is capped as described under "overfishing" below.

Overfishing is defined as any amount of fishing in excess of a prescribed maximum allowable rate. This maximum allowable rate is prescribed through a set of six tiers which are listed below in descending order of preference, corresponding to descending order of information availability. The SSC will have final authority for determining whether a given item of information is reliable for the purpose of this definition, and may use either objective or subjective criteria in making such determinations. For Tier (1), a pdf refers to a probability density function. For Tiers (1-2), if a reliable pdf of B_{MSY} is available, the preferred point estimate of B_{MSY} is the geometric mean of its pdf. For Tiers (1-5), if a reliable pdf of B is available, the preferred point estimate is the geometric mean of its pdf. For Tiers (1-3), the coefficient 'α' is set at a default value of 0.05, with the understanding that the SSC may establish a different value for a specific stock or stock complex as merited by the best available scientific information. For Tiers (2-4), a designation of the form "$F_{X\%}$" refers to the F associated with an equilibrium level of spawning per recruit (SPR) equal to X percent of the equilibrium level of spawning per recruit in the absence of any fishing. If reliable information sufficient to characterize the entire maturity schedule of a species is not available, the SSC may choose to view SPR calculations based on a knife-edge maturity assumption as reliable. For Tier (3), the term $B_{40\%}$ refers to the long-term average biomass that would be expected under average recruitment and $F=F_{40\%}$.

Overfished or approaching an overfished condition is determined for all age-structured stock assessments by comparison of the stock level in relation to its MSY level according to harvest scenarios 6 and 7 described in the next section (for Tier 3 stocks, the MSY level is defined as $B_{35\%}$). For stocks in Tiers 4-6, no determination can be made of overfished status or approaching an overfished condition as information is insufficient to estimate the MSY stock level.

Standard Harvest and Recruitment Scenarios and Projection Methodology

A standard set of projections is required for each stock managed under Tiers 1, 2, or 3 of Amendment 56. This set of projections encompasses seven harvest scenarios designed to satisfy the requirements of Amendment 56, the National Environmental Policy Act, and the MSFCMA.

For each scenario, the projections begin with an estimated vector of 2014 numbers at age. In each subsequent year, the fishing mortality rate is prescribed on the basis of the spawning biomass in that year and the respective harvest scenario. In each year, recruitment is drawn from an inverse Gaussian distribution whose parameters consist of maximum likelihood estimates determined from recruitments estimated in the assessment. Spawning biomass is computed in each year based on the time of peak spawning and the maturity and weight schedules described in the assessment. Total catch is assumed to equal the catch associated with the respective harvest scenario in all years, except that in the first of the projection, a lower catch may be specified for stocks where catch is typically below ABC. This projection scheme is run 1000 times to obtain distributions of possible future stock sizes, fishing mortality rates, and catches.

Five of the seven standard scenarios will be used in an Environmental Assessment prepared in conjunction with the final SAFE. These five scenarios, which are designed to provide a range of harvest alternatives that are likely to bracket the final TACs for 2014 and 2015, are as follow ("*max* F_{ABC}" refers to the maximum permissible value of F_{ABC} under Amendment 56):

Tier

1) Information available: *Reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY}.*
   - 1a) Stock status: $B/B_{MSY} > 1$
     - $F_{OFL} = \mu_A$, *the arithmetic mean of the pdf*
     - $F_{ABC} \leq \mu_H$, *the harmonic mean of the pdf*
   - 1b) Stock status: $\alpha < B/B_{MSY} \leq 1$
     - $F_{OFL} = \mu_A \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
     - $F_{ABC} < \mu_H \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
   - 1c) Stock status: $B/B_{MSY} < \alpha$
     - $F_{OFL} = 0$
     - $F_{ABC} = 0$
2) Information available: *Reliable point estimates of B, B_{MSY}, F_{MSY}, $F_{35\%}$, and $F_{40\%}$.*
   - 2a) Stock status: $B/B_{MSY} > 1$
     - $F_{OFL} = F_{MSY}$
     - $F_{ABC} \leq F_{MSY} \times (F_{40\%}/F_{35\%})$
   - 2b) Stock status: $\alpha < B/B_{MSY} \leq 1$
     - $F_{OFL} = F_{MSY} \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
     - $F_{ABC} \leq F_{MSY} \times (F_{40\%}/F_{35\%}) \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
   - 2c) Stock status: $B/B_{MSY} < \alpha$
     - $F_{OFL} = 0$
     - $F_{ABC} = 0$
3) Information available: *Reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.*
   - *3a) Stock status: $B/B_{40\%} > 1$*
     - $F_{OFL} = F_{35\%}$
     - $F_{ABC} < F_{40\%}$
   - *3b) Stock status: $\alpha < B/B_{40\%} \leq 1$*
     - $F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$
     - $F_{ABC} \leq F_{40\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$
   - *3c) Stock status: $B/B_{40\%} < \alpha$*
     - $F_{OFL} = 0$
     - $F_{ABC} = 0$
4) Information available: *Reliable point estimates of B, $F_{35\%}$, and $F_{40\%}$.*
   - $F_{OFL} = F_{35\%}$
   - $F_{ABC} < F_{40\%}$
5) Information available: *Reliable point estimates of B and natural mortality rate M.*
   - $F_{OFL} = M$
   - $F_{ABC} \leq 0.75 \times M$
6) Information available: *Reliable catch history from 1978 through 1995.*
   - *OFL = the average catch from 1978 through 1995, unless an alternative value is established by the SSC on the basis of the best available scientific information*
   - $ABC \leq 0.75 \times OFL$

Scenario 1: In all future years, *F* is set equal to *max* F_{ABC}. (Rationale: Historically, TAC has been constrained by ABC, so this scenario provides a likely upper limit on future TACs.)

Scenario 2: In all future years, *F* is set equal to a constant fraction of *max* F_{ABC}, where this fraction is equal to the ratio of the F_{ABC} value for 2014 recommended in the assessment to the *max* F_{ABC} for 2014. (Rationale: When F_{ABC} is set at a value below *max* F_{ABC}, it is often set at the value recommended in the stock assessment.)

Scenario 3: In all future years, *F* is set equal to the 2008-2012 average *F*. (Rationale: For some stocks, TAC can be well below ABC, and recent average *F* may provide a better indicator of F_{TAC} than F_{ABC}.)

Scenario 4: In all future years, the upper bound on F_{ABC} is set at $F_{60\%}$. (Rationale: This scenario provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward when stocks fall below reference levels.)

Scenario 5: In all future years, F is set equal to zero. (Rationale: In extreme cases, TAC may be set at a level close to zero.)

Two other scenarios are needed to satisfy the MSFCMA's requirement to determine whether a stock is currently in an overfished condition or is approaching an overfished condition. These two scenarios are as follow (for Tier 3 stocks, the MSY level is defined as $B_{35\%}$):

Scenario 6: In all future years, F is set equal to F_{OFL}. (Rationale: This scenario determines whether a stock is overfished. If the stock is 1) above its MSY level in 2013 or 2) above 1/2 of its MSY level in 2013 and expected to be above its MSY level in 2023 under this scenario, then the stock is not overfished.)

Scenario 7: In 2014 and 2015, F is set equal to *max* F_{ABC}, and in all subsequent years, F is set equal to F_{OFL}. (Rationale: This scenario determines whether a stock is approaching an overfished condition. If the stock is 1) above its MSY level in 2015 or 2) above 1/2 of its MSY level in 2015 and expected to be above its MSY level in 2025 under this scenario, then the stock is not approaching an overfished condition.)

Overview of "Stock Assessment" Section

The current status of individual groundfish stocks managed under the FMP is summarized in this section. Plan Team recommendations for 2014 and 2015 ABCs and OFLs are summarized in Tables 1, 5, and 6.

The sum of the recommended ABCs for 2014 and 2015 are 2,572,819 t and 2,474,632 t, respectively. These compare with the sums of the 2013 ABCS (2,639,317 t) and 2012 ABCs (2,510,000 t), indicating relative stability. The Team recommended maximum permissible ABCs for all stocks, except for EBS pollock.

Overall, the status of the stocks continues to appear favorable. Nearly all stocks are above B_{MSY} or the B_{MSY} proxy of $B_{35\%}$. The abundances of EBS pollock, EBS Pacific cod, sablefish; all rockfishes managed under Tier 3 except AI blackspotted/rougheye, and all flatfishes managed under Tiers 1 or 3 are projected to be above B_{MSY} or the B_{MSY} proxy of $B_{35\%}$ in 2014. The abundances of four stocks are projected to be below $B_{35\%}$ for 2014: AI pollock by about 2 percent, sablefish by about 1%, Greenland turbot by about 13 percent, and AI blackspotted/rougheye rockfish by about 7 percent.

The sum of the biomasses for 2014 listed in Table 5 is nearly the same as reported for 2013, following declines of 5 percent from 2013 to 2012 and 6 percent from 2012 to 2011. Pollock and Pacific cod biomasses were fairly flat at increased levels, after a period of decline. Pollock biomasses have been decreasing, after peaking in 2011. Pacific cod biomass peaked in 2012. Flatfishes are generally increasing. Biomass of Greenland turbot has been increasing due to recent increased recruitment, but is still low. Following recent declines, biomass of Atka mackerel is increasing.

Summary and Use of Terms

Stock status is summarized and OFL and ABC recommendations are presented on a stock-by-stock basis in the remainder of this section, with the following conventions observed:

"Fishing mortality rate" refers to the full-selection F (i.e., the rate that applies to fish of fully selected sizes or ages), except in the cases of stocks managed under Tier 1 (EBS pollock, yellowfin sole, and northern rock sole). For these stocks, the fishing mortality rate consists of the ratio between catch (in biomass) and biomass at the start of the year. EBS pollock uses "fishable biomass" whereas yellowfin sole and northern rock sole use age 6+ biomass for this calculation.

"Projected age+ biomass" refers to the total biomass of all cohorts of ages greater than or equal to some minimum age, as projected for January 1 of the coming year. The minimum age varies from species to species. When possible, the minimum age corresponds to the age of recruitment listed in the respective stock assessment. Otherwise, the minimum age corresponds to the minimum age included in the assessment model, or to some other early age traditionally used for a particular species. When a biomass estimate from the trawl survey is used as a proxy for projected age+ biomass, the minimum age is assumed to correspond with the age of recruitment, even though the survey may not select that age fully and undoubtedly selects fish of younger ages to some extent.

The reported ABCs and OFLs for past years correspond to the values approved by the Council. Projected ABCs and OFLs listed for the next two years are the Team's recommendations.

Reported catches are as of November 9, 2013.

Two-Year OFL and ABC Projections

Proposed and final harvest specifications are adopted annually for a two year period. This requires the Team to provide OFLs and ABCs for the next two years in this cycle (Table 1). The 2014 harvest specifications (from Council recommendations in December 2012) are in place to start the fishery on January 1, 2014, but these will be replaced by final harvest specifications that will be recommended by the Council in December 2013. The final 2014 and 2015 harvest specifications will become effective when final rulemaking occurs in February or March 2014.This process allows the Council to use the most current survey and fishery data in stock assessment models for setting quotas for the next two years, while having no gap in harvest specifications.

The 2015 ABC and OFL values recommended in next year's SAFE report are likely to differ from this year's projections for 2015 because of new (e.g., survey) information that is incorporated into the assessments. In the case of stocks managed under Tier 3, ABC and OFL projections for the second year in the cycle are typically based on the output for Scenarios 1 or 2 from the standard projection model using assumed (best estimates) of actual catch levels. For stocks managed under Tiers 4-6, projections for the second year in the cycle are set equal to the Plan Team's recommended values for the first year in the cycle.

Survey Calibration

During a recent collaboration between the International Pacific Halibut Commission (IPHC) and the Alaska Fisheries Science Center (AFSC), Pacific halibut catch data from the IPHC database and the AFSC bottom trawl survey database were compared for survey years 1982 to 2012. The IPHC maintains its own database containing Pacific halibut catch sample data from the eastern Bering Sea (EBS) shelf bottom trawl survey. Discrepancies for 184 catch samples were found between the two databases. Original catch data sheets from the EBS bottom trawl survey were scrutinized to determine the reason for the discrepancies. The standard sampling practice for the EBS shelf bottom trawl survey, with rare exception, has always been to sample 100% of the Pacific halibut from survey catches. The majority of discrepancies between the two databases were the result of an incorrect application of an expansion factor to the Pacific halibut catch sample. Expansion factors are applied to bottom trawl survey catch samples when less than 100% of the total catch is sampled for a species, and the sampled portion is expanded to the total catch weight. Thus, the application of an expansion factor to Pacific halibut catch samples caused inflation to both total weights and numbers of Pacific halibut, and equivalent reductions to the total weights and numbers for other species in the catch that were sampled at less than 100%. Errors between the IPHC and AFSC databases were reconciled and corrections were made to the AFSC bottom trawl survey database. Except for halibut, there were only minor changes (<0.1%) in the time series for groundfish estimates of biomass and abundance. Catch weights and numbers of commercial crab species were unaffected by these edits because in all cases, 100% were sampled from the catch and entered correctly into the AFSC bottom trawl survey database.

Ecosystem Considerations

The Ecosystem Assessment provided streamlined Report Cards for both the Bering Sea and Aleutian Islands. Overall, 55 indices were updated.

Eastern Bering Sea In the Bering Sea, sea ice remained extensive in 2013. Jellyfish remain abundant in the groundfish survey. Motile epifanua and benthic foragers show stable biomass; pelagic foragers have increased from recent lows towards the mean, driven both by increases in pollock and capelin in the survey. Apex predators are near their 30-year mean, with a recent decrease in arrowtooth flounder on the shelf. Foraging conditions for seabirds have been favorable, and the first increase in fur seal pup production since 1998 was reported. Total area trawled decreased from 2011 to 2012. New contributions include reports on pH, oxygen, salinity, and turbidity.

Aleutian Islands Due to the lack of a groundfish survey, few assessment-level indices were updated this year. Updated indices showed declines in auklets, stable school enrollment, and a decline in the total area trawled.

Economic Summary of the BSAI Commercial Groundfish Fisheries in 2011-12

The domestic groundfish fishery off Alaska (BSAI and GOA) is the largest fishery by volume in the U.S. With a total catch of 2.12 million metric tons (t), a retained catch of 2.05 million t, and an ex-vessel value of $1.05 million in 2012, it accounted for 47.4% of the weight and 19.9% of the ex-vessel value of total U.S. domestic landings as reported in Fisheries of the United States, 2011. The real ex-vessel value of all Alaska domestic fish and shellfish catch, including the estimated value of fish caught almost exclusively by catcher/processors, decreased from $2.12 billion in 2011 to $1.94 billion in 2012. The first wholesale value of 2012 groundfish catch was $2.54 billion (F.O.B. Alaska). The 2012 total groundfish catch increased by 2.3% while the total first-wholesale value increased by 1.1% relative to 2011. The groundfish fisheries accounted for the largest share (54%) of the ex-vessel value of all commercial fisheries off Alaska, while the Pacific salmon (*Oncorhynchus spp.*) fishery was second with $441 million or 23% of the total Alaska ex-vessel value. The value of the shellfish fishery amounted to $284 million or 15% of the total for Alaska and exceeded the value of Pacific halibut (*Hippoglossus stenolepis*) with $145 million or 7.4% of the total for Alaska (Figure 3).

The Economic SAFE report (bound separately) contains detailed information about economic aspects of the groundfish fisheries, including figures and tables, catch share fishery indicators, a summary of the Alaskan community participation in fisheries, an Amendment 80 fishery economic data report (EDR) summary, market profiles for the most commercially valuable species, a summary of the relevant research being undertaken by the Economic and Social Sciences Research Program (ESSRP) at the Alaska Fisheries Science Center (AFSC) and a list of recent publications by ESSRP analysts. The figures and tables in the report provide estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, the ex-vessel value of the groundfish catch, the ex-vessel value of the catch in other Alaska fisheries, the gross product value of the resulting groundfish seafood products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, vessel activity, and employment on at-sea processors. Generally, the data presented in this report cover the years 2008 through 2012, but limited catch and ex-vessel value data are reported for earlier years in order to illustrate the rapid development of the domestic groundfish fishery in the 1980s and to provide a more complete historical perspective on catch. Several series have been discontinued and new price/revenue tables from an alternative source are presented in Appendix A: Ex-vessel Economic Data Tables: alternative pricing based on CFEC fish tickets.

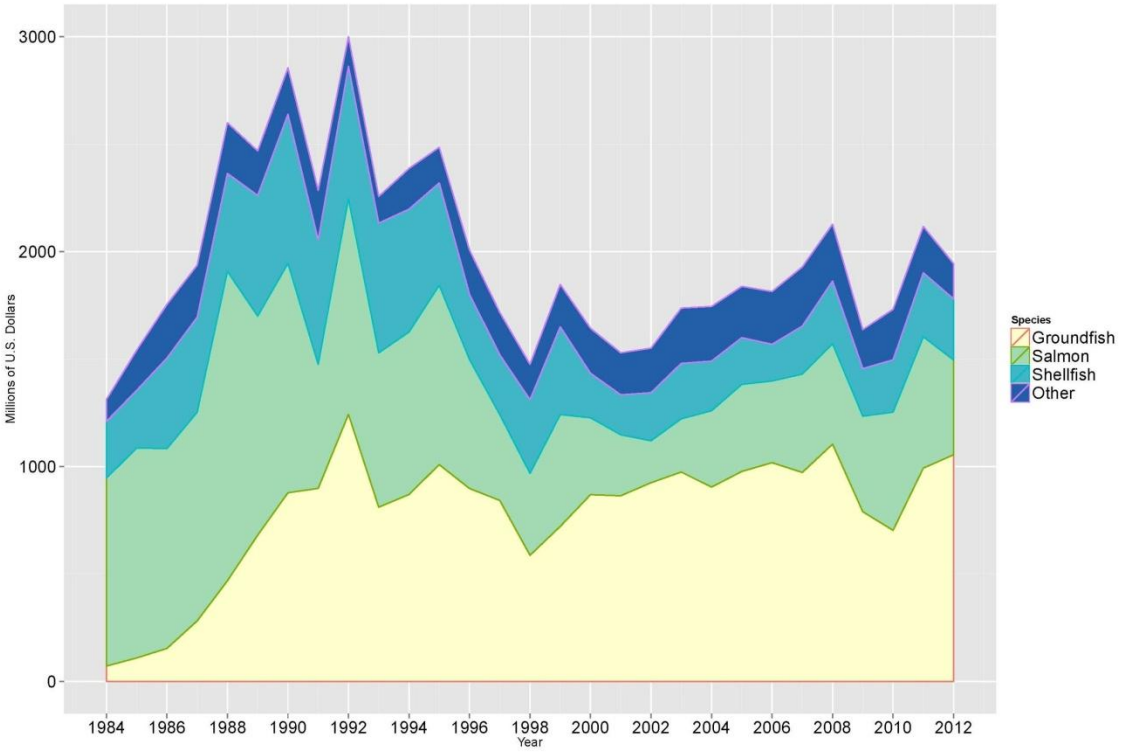

Figure 3. Real ex-vessel value of the domestic fish and shellfish catch off Alaska (GOA and BSAI) by species group, 1984-2012 (base year = 2012).

The Economic SAFE report updates the set of market profiles for pollock, Pacific cod, sablefish, and yellowfin sole that displays the markets for these species in terms of pricing, volume, supply and demand, and trade. In addition, the Economic SAFE contains links to data on some of the external factors that impact the economic status of the fisheries. Such factors include foreign exchange rates, the prices and price indices of products that compete with products from these fisheries, domestic per capita consumption of seafood products, and fishery imports.

The Economic SAFE report also updates a section that analyzes economic performance of the groundfish fisheries using indices. These indices are created for different sectors of the North Pacific, and relate changes in value, price, and quantity across species, product and gear types to aggregate changes in the market. The tables from this and past Economic SAFE reports are available online at http://www.afsc.noaa.gov/REFM/Socioeconomics/documents.php.

Decomposition of the change in first-wholesale revenues from 2011-12 in the BSAI

The following brief analysis summarizes the overall changes that have occurred in the quantity produced, value, and revenue generated from Alaska groundfish. According to data reported in the 2013 Economic SAFE report, the ex-vessel value of Alaska groundfish in the BSAI grew from approximately $758.4 million in 2011 to approximately $815.4 million in 2012, which is an increase of 7.5% (Figure 4), and first-wholesale revenues from the processing and production of Alaska groundfish in the BSAI area increased slightly from approximately $2.1 billion in 2011 to $2.2 billion in 2012 (Figure 5). During that same time period, the total quantity of groundfish products from the BSAI increased by 1.5% from 790.9 thousand metric tons to 802.7 thousand metric tons, an increase of 11.8 thousand metric tons. These changes in the BSAI account for part of the change in first-wholesale revenues from Alaska groundfish fisheries overall which increased by $27.9 million, a relative difference of 1.1%, in 2012 compared to 2011 levels.

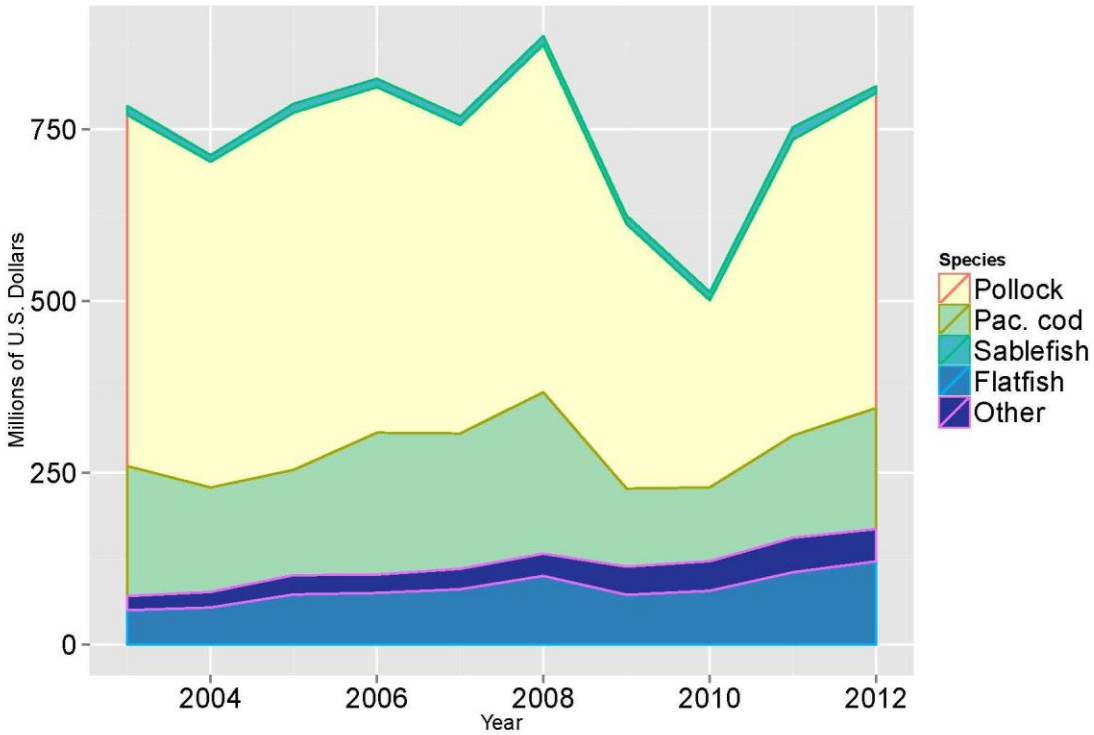

Figure 4. Real ex-vessel value of the groundfish catch in the domestic commercial fisheries in the BSAI area by species, 2003-2012 (base year = 2012).

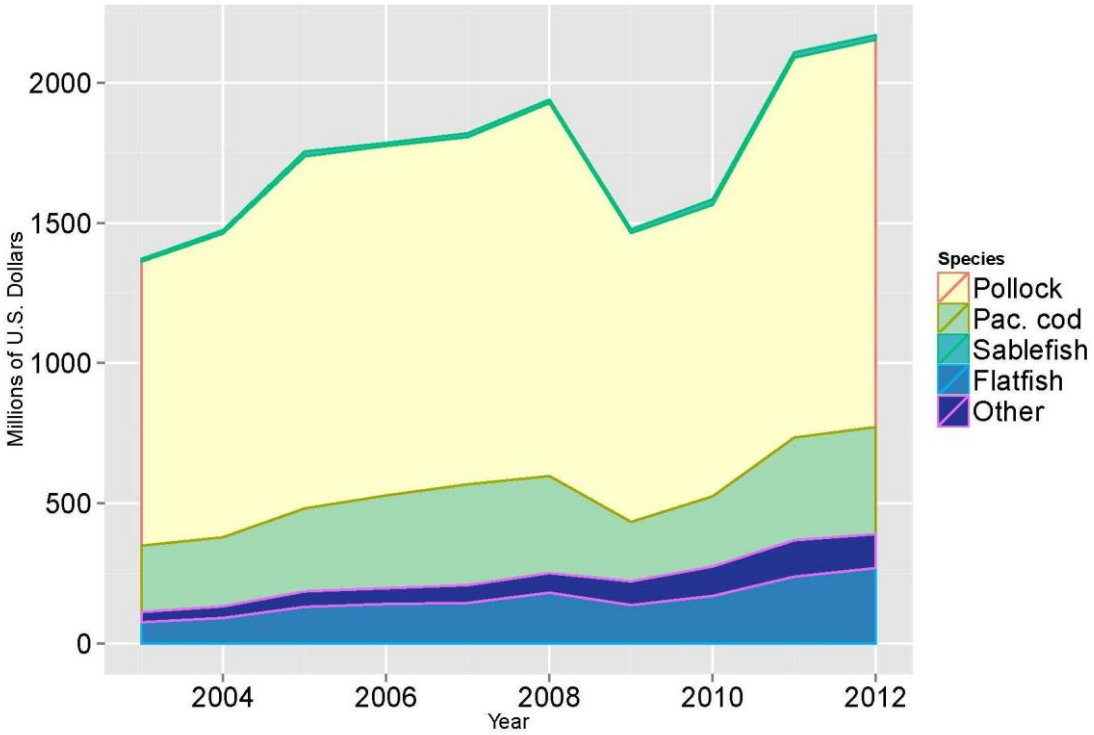

Figure 5. Real gross product value of the groundfish catch in the BSAI area by species, 2003-2012 (base year = 2012).

By species, positive price and quantity effects for flatfish added $30.8 million in value, the largest net effect, in the BSAI first-wholesale revenue decomposition for 2011-12 (Figure 6). In addition, pollock had a positive price effect of $62.3 million, partially offset by a negative quantity effect of $36.1 million, for a positive net effect of $26.3 million. Pacific cod had a negative price effect of $33.7 million, and a positive quantity effect of $49.5 million for a positive net effect of $15.8 million. Negative price and quantity effects for rockfish combined for a negative net effect of $11.2 million in the BSAI first-wholesale revenue decomposition for 2011-12. By product group, positive price and quantity effects combined to add a net effect of $100.5 million for surimi, which in terms of total revenues was partially offset by a negative quantity effect of $48.1 million for fillets in the BSAI first-wholesale revenue decomposition for 2011-12.

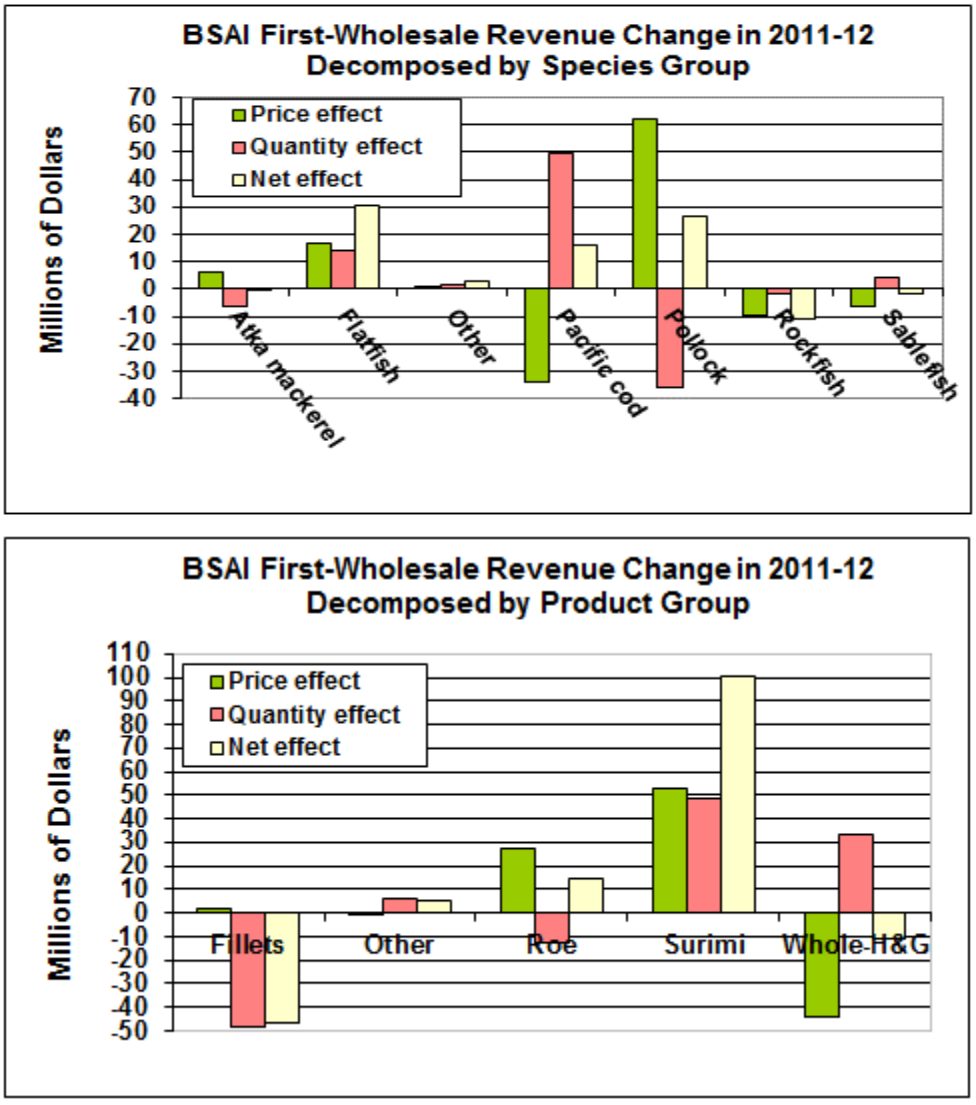

Figure 6. Decomposition of the change in first-wholesale revenues during 2011-2012 in the BSAI.

The first decomposition is by the species groups used in the Economic SAFE report, and the second decomposition is by product group. The price effect refers to the change in revenues due to the change in the first-wholesale price index (current dollars per metric ton) for each group. The quantity effect refers to the change in revenues due to the change in production (in metric tons) for each group. The net effect is the sum of price and quantity effects. Year to year changes in the total quantity of first-wholesale groundfish products reflect changes in total catch and the mix of product types (e.g., fillet vs. surimi).

Stock Status Summaries

Due to the government shutdown in October 2013, stock assessments for an abbreviated suite of model runs were required only for Steller sea lion prey species (pollock, Pacific cod, Bering Sea/Aleutian Islands Atka mackerel), and species where a conservation concern has been noted. In such "abbreviated" assessments, authors were not required to include alternative models and were not required to respond to SSC or Team comments, among other things. For all other Tier 1-3 stocks, updated projections from last year using 2013 catch data were required at a minimum, with results presented in executive summaries using the "off-year" format for stocks on biennial assessment cycles. For stocks managed in Tiers 4-6, executive summaries using the "off-year" format for biennial assessment cycles were required. Assessments presented in executive summary format are noted as such under the "Changes from previous assessment" subheading.

1. Walleye Pollock

Status and catch specifications (t) of walleye pollock in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The age grouping is 3+ for eastern Bering Sea, 2+ for the Aleutian Islands and the survey biomass for Bogoslof, as reported in the respective assessments. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Biomass	OFL	ABC	TAC	Catch
Eastern Bering Sea	2012	8,340,000	2,470,000	1,220,000	1,200,000	1,205,258
	2013	8,140,000	2,550,000	1,375,000	1,247,000	1,267,963
	2014	8,045,000	2,795,000	1,369,000	n/a	n/a
	2015	7,778,000	2,693,000	1,258,000	n/a	n/a
Aleutian Islands	2012	251,000	39,600	32,500	19,000	975
	2013	266,000	45,600	37,300	19,000	2,964
	2014	259,525	42,811	35,048	n/a	n/a
	2015	289,307	47,713	39,412	n/a	n/a
Bogoslof	2012	110,000	22,000	16,500	500	79
	2013	67,100	13,400	10,100	100	57
	2014	67,063	13,413	10,059	n/a	n/a
	2015	67,063	13,413	10,059	n/a	n/a

*In 2012, NMFS reallocated 12,400 t of pollock TAC from the Aleutian Islands to the Bering Sea which increased the Bering Sea TAC to 1,212,400 t and decreased the Aleutian Islands TAC to 6,600 t. In 2013, NMFS reallocated 14,900 t of pollock TAC from the Aleutian Islands to the Bering Sea, which increased the Bering Sea TAC to 1,261,900 t and decreased the Aleutian Islands TAC to 4,100 t.

Eastern Bering Sea

Changes from previous assessment

New data in this year's assessment include the following:

- 2013 summer bottom trawl survey abundance at age
- 2012 and 2013 abundance estimates from the "acoustic vessels of opportunity" index
- updated 2012 summer acoustic-trawl survey abundance at age (data using an age-length key from that survey replaced those in last year's assessment that were based on an age-length key from the bottom trawl survey)
- updated catch at age and average weight at age from the 2012 fishery
- updated total catch, including preliminary value for 2013

There were no changes in the authors' recommended assessment model.

Spawning biomass and stock status trends

Spawning biomass in 2008 was at the lowest level since 1980, but has increased by 71 percent since then, with a 2% decrease projected for next year. The 2008 low was the result of extremely poor recruitments from the 2002-2005 year classes. Recent and projected increases are fueled by slightly above average recruitment from the 2006 year class and very strong recruitment from the 2008 year class along with reductions in average fishing mortality (ages 3-8) from 2009-2012. Spawning biomass is projected to be 23 percent and 16 percent above B_{MSY} in 2014 and 2015, respectively.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that EBS pollock qualifies for management under Tier 1 because there are reliable estimates of B_{MSY} and the probability density function for F_{MSY}. The Team concurred with the SSC's conclusion that the Tier 1 reference points continue to be reliably estimated.

The updated estimate of B_{MSY} from the present assessment is 2.122 million t, similar to last year's estimate of 2.114 million t. Projected spawning biomass for 2014 is 2.606 million t, placing EBS walleye pollock in sub-tier "a" of Tier 1. As in recent assessments, the maximum permissible ABC harvest rate was based on the ratio between MSY and the equilibrium biomass corresponding to MSY. The harmonic mean of this ratio from the present assessment is 0.469, down 4 percent from last year's value of 0.491. The harvest ratio of 0.469 is multiplied by the geometric mean of the projected fishable biomass for 2014 (5.391 million t) to obtain the maximum permissible ABC for 2014, which is 2.528 million t, up 10 percent and down 3 percent from the maximum permissible ABCs for 2013 and 2014 projected in last year's assessment.

However, as with other recent EBS pollock assessments, the authors recommend setting ABCs well below the maximum permissible levels. They list five reasons for doing so in the SAFE chapter.

Beginning with the 2010 assessment, the Team and SSC have based ABC recommendations on the most recent 5-year average fishing mortality rate. This year, the authors' base their 2014 and 2015 ABC recommendations on the same strategy, giving values of 1.369 million t and 1.258 million t, respectively. The Team concurs with these recommendations, noting that this assessment is very much in line with projections made last year and noting also that the October government shutdown limited opportunities for analysis of alternative harvest strategies.

The OFL harvest ratio under Tier 1a is 0.518, the arithmetic mean of the ratio between MSY and the equilibrium fishable biomass corresponding to MSY. The product of this ratio and the geometric mean of the projected fishable biomass for 2014 determines the OFL for 2014, which is 2.795 million t. The current projection for OFL in 2015 given a 2014 catch equal to the Team's recommended ABC is 2.693 million t.

Status determination

The walleye pollock stock in the EBS is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Aleutian Islands

Changes from previous assessment

The new data in the model consist of updated catch information. There were no changes in the assessment methodology.

Spawning biomass and stock status trends

This year's assessment estimates that spawning biomass reached a minimum level of about $B_{23\%}$ in 1999 and then has generally increased, with a projected value of $B_{33\%}$ for 2014. The increase in spawning biomass since 1999 has resulted more from a dramatic decrease in harvest than from good recruitment, as there have been no above-average year classes spawned since 1989. Spawning biomass for 2014 is projected to be 79,029 t.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that this stock qualifies for management under Tier 3. The Team concurred and supported continued use of last year's model for evaluating stock status and recommending ABC. The model estimates $B_{40\%}$ at a value of 96,006 t, placing the AI pollock stock in sub-tier "b" of Tier 3. The model estimates the values of $F_{35\%}$ as 0.41 and $F_{40\%}$ as 0.33. Under Tier 3b, with the adjusted value of $F_{40\%}$=0.26, the maximum permissible ABC is 35,048 t for 2014. The Team recommended setting 2014 ABC at this level. Following the Tier 3b formula with the adjusted value of $F_{35\%}$=0.33, OFL for 2014 is 42,811 t. Given a 2014 catch of 19,000 t, the maximum permissible ABC would be 32,950 for 2015 and the projected OFL would be 40,290 t. If the 2014 catch is only 1,294 t (i.e., equal to the five year average for 2008-2012), the 2015 maximum permissible ABC would be 39,412 t and the 2015 OFL would be 47,713 t. The Team recommended setting 2015 ABC and OFL at the latter levels.

Status determination

The walleye pollock stock in the Aleutian Islands is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Bogoslof

Changes from previous assessment

No Bogoslof pollock acoustic-trawl survey was conducted in 2013. The 2012 Bogoslof pollock acoustic-trawl survey resulted in the lowest estimate of biomass (67,100 t) in the region since the survey began in 1988.

Spawning biomass and stock status trends

Survey biomass estimates since 2000 have all been lower than estimates prior to 2000, ranging from a low of 67,063 t in 2012 to a high of 301,000 t in 2000.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that this stock qualifies for management under Tier 5. The maximum permissible ABC value for 2014 would be 10,059 t (assuming M = 0.2 and F_{ABC} = 0.75 x M = 0.15): ABC = B_{2012} x M x 0.75 = 67,063 x 0.2 x 0.75 = 10,059 t. The projected ABC for 2015 is the same.

Following the Tier 5 formula with M=0.20, OFL for 2014 is 13,413 t. The OFL for 2015 is the same.

Status determination

The walleye pollock stock in the Bogoslof district is not being subjected to overfishing. It is not possible to determine whether this stock is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

2. Pacific cod

There is a major change in the Pacific cod assessment this year. Previously an analytical assessment was done for cod in the eastern Bering Sea (EBS), and the abundance estimate from that assessment was extrapolated to the Aleutian Islands (AI) region on the basis of survey estimates of relative abundance. This year, in anticipation of separate regional specifications of OFL and ABC by the SSC, separate assessments were done for the EBS and AI regions. The assessment author and the Team recommend a Tier 3 assessment for the EBS and a Tier 5 assessment for the Aleutians.

Status and catch specifications (t) of Pacific cod in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 3+ biomass	OFL	ABC	TAC*	Catch
BS/AI	2012	1,620,000	369,000	314,000	275,000	245,823
	2013	1,510,000	359,000	307,000	260,000	221,396
Eastern Bering Sea	2014	1,550,000	299,000	255,000	n/a	n/a
	2015	1,600,000	319,000	272,000	n/a	n/a
Aleutian Islands	2014	59,000**	20,100	15,100	n/a	n/a
	2015	59,000**	20,100	15,100	n/a	n/a

*The Council sets the Federal TAC to account for the State of Alaska Aleutian Islands Guideline Harvest Level fishery that is set equal to 3 percent of the BSAI ABC. Catch includes only that which accrues to the Federal TAC.
**Biomass shown for AI cod is survey biomass (Tier 5) not Age 3+ biomass.

Eastern Bering Sea

Changes from previous assessment

All survey and commercial data series on CPUE, catch at age, and catch at length were updated. Survey CPUE has been mostly steady since 2010, with modest decreases between 2012 and 2013 (numbers down 24%, biomass down 11%).

As in the last several years, a number of alternative candidate models were considered at Team/SSC meetings in May/June and September/October, but owing to the government shutdown in October none was implemented, so there were no changes in assessment methods. This year's assessment is a rerun of last year's accepted model (Model 1, the same as the 2011 accepted model) with updated data files.

Spawning biomass and stock status trends

The 2006, 2008, and 2010 year classes appear to be strong, and spawning abundance is expected to increase in the near term.

Tier determination/ Plan Team discussion and resulting ABC and OFL recommendations

$B_{40\%}$ for this stock is estimated to be 318,000 t and projected spawning biomass in 2014 according to Model 1 is 361,000 t, so this stock is assigned to Tier 3a. The Team concurred with the author's recommendation to set ABCs for 2014 and 2015 at the maximum permissible levels under Tier 3a, which are 255,000 t and 272,000 t, respectively. The corresponding OFLs are 299,000 t and 319,000 t.

Status determination

EBS Pacific cod is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Aleutian Islands

Changes from previous assessment

For some years there has been concern that a disproportionate share of the BSAI TAC was being taken from the Aleutians. The separate specification of EBS and AI OFL/ABC for the AI region is a response to that practice.

Although separate assessments of the AI stock have been included in the last two SAFE reports (an approach based on Tier 5 in 2011 and multiple age-structured models in 2012), none have yet been accepted by the SSC. This year's assessment contains two models that would be consistent with management under Tier 3, and two others that would be consistent with management under Tier 5. All four models were requested by the Team and SSC.

The AI assessment data consist of catch in weight and catch length frequencies from the commercial fishery, and CPUE and length frequencies from the AI trawl survey. The only age data are from the 2012 survey.

Spawning biomass and stock status trends

The survey time series from 1991-2012 shows a fairly consistent decline throughout.

Tier determination/ Team discussion and resulting ABC and OFL recommendations

The Team concluded that neither of the age-structured models performed credibly. For the time being, the author and the Team recommend a Tier 5 approach, specifically the random effects model. Assuming a natural mortality rate of 0.34 (as in the EBS assessment), this results in 2014 and 2015 maximum permissible ABCs of 15,100 t, which are the Team's recommended ABC values. The corresponding OFLs for both years are 20,100 t. Work on a Tier 3 assessment is anticipated to continue.

Status determination

This stock is not being subjected to overfishing. Assuming that the SSC concurs with the Team's recommendation to manage this stock under Tier 5, it is not possible to determine whether this assemblage is overfished or whether it is approaching an overfished condition.

3. Sablefish

Status and catch specifications (t) of sablefish in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 4+ Biomass	OFL	ABC	TAC	Catch
Being Sea	2012	30,000	2,640	2,230	2,230	740
	2013	19,000	1,870	1,580	1,580	640
	2014	21,000	1,584	1,339	n/a	n/a
	2015	19,000	1,432	1,210	n/a	n/a
Aleutian Islands	2012	26,000	2,430	2,050	2,050	1,199
	2013	28,000	2,530	2,140	2,140	1,090
	2014	28,000	2,141	1,811	n/a	n/a
	2015	26,000	1,936	1,636	n/a	n/a

Changes from previous assessment

The assessment model incorporates the following new data into the model:

- relative abundance and length data from the 2013 longline survey
- relative abundance and length data from the 2012 longline and trawl fisheries
- age data from the 2012 longline survey and 2012 fixed gear fishery
- abundance and length data from the 2013 Gulf of Alaska trawl survey
- updated 2012 catch and estimated 2013 catch

There were no model changes.

Spawning biomass and stock status trends

The fishery abundance index decreased 3% from 2011 to 2012 (the 2013 data are not available yet). The longline survey abundance index decreased 5% from 2012 to 2013 following a 21% decrease from 2011 to 2012. The GOA trawl survey biomass index decreased 29% from the last trawl survey in 2011. Spawning biomass is projected to decrease from 2014 to 2018, and then stabilize.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Sablefish are managed under Tier 3 of the NPFMC harvest control rules. Reference points are calculated using recruitments from 1979-2011. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ from this assessment are 106,361 t (combined across the EBS, AI, and GOA), 0.094, and 0.112, respectively. Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of $B_{40\%}$), placing sablefish in sub-tier "b" of Tier 3. The maximum permissible value of F_{ABC} under Tier 3b is 0.080, which translates into a 2014 ABC (combined areas) of 13,722 t. The OFL fishing mortality rate is 0.095 which translates into a 2014 OFL (combined areas) of 16,225 t. Model projections indicate that this stock is not subject to overfishing, overfished, nor approaching an overfished condition.

Area allocations

In December 1999, the Council apportioned the 2000 ABC and OFL based on a 5-year exponential weighting of the survey and fishery abundance indices. The same algorithm has been used to apportion the ABC and OFL since 2000. Following the standard apportionment scheme, the objective to reduce variability in apportionment was not being achieved. Since 2007, the average change in apportionment by area has increased annually. While some of these changes may actually reflect interannual changes in regional abundance, they most likely reflect the high movement rates of the population and the high variability of estimates of abundance in the Bering Sea and Aleutian Islands. For example, the apportionment for the Bering Sea has varied dramatically since 2007, attributable to high variability in both survey abundance and fishery CPUE estimates in the Bering Sea. These large annual changes in apportionment result in increased variability of ABCs by area, including areas other than the Bering Sea. Because of the high variability in apportionment seen in recent years, the standard method is not meeting the goal of reducing the magnitude of interannual changes in the apportionment. The assessment authors proposed that the apportionment scheme be reevaluated. Therefore, for 2014, the assessment authors and Team recommended keeping the apportionment fixed from 2013, so that all areas decline equally in accordance with the overall model results.

Status determination

Sablefish is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

4. Yellowfin sole

Status and catch specifications (t) of yellowfin sole in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 6+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	1,950,000	222,000	203,000	202,000	147,186
	2013	1,960,000	220,000	206,000	198,000	156,302
	2014	2,113,000	259,700	239,800	n/a	n/a
	2015	2,188,000	268,900	248,300	n/a	n/a

Changes from previous assessment

Changes to the input data for this year's assessment include:

- 2012 fishery age composition.
- 2012 survey age composition.
- 2013 trawl survey biomass point estimate and standard error.
- estimate of the discarded and retained portions of the 2012 catch.
- estimate of total catch made through the end of 2013.

There were no changes to the assessment methodology.

Spawning biomass and stock status trends

The projected female spawning biomass estimate for 2014 is 581,100 t, which is nearly identical to the 2013 estimate from last year's assessment (582,300 t). The projected spawning biomass for 2014 and beyond suggests a turnaround from the generally monotonic decline in spawning

biomass that has prevailed since 1994. Likewise, the total stock biomass is trending upwards due to high recruitment from the 2003 year class.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that reliable estimates of B_{MSY} and the probability density function for F_{MSY} exist for this stock. Accordingly, yellowfin sole qualify for management under Tier 1. The estimate of B_{MSY} from the present assessment is 366,000 t. Corresponding to the approach used in recent years, the 1978-2006 stock-recruitment data were used this year to determine the Tier 1 harvest recommendation. This provided a maximum permissible ABC harvest ratio (the harmonic mean of the F_{MSY} harvest ratio) of 0.113. The current value of the OFL harvest ratio (the arithmetic mean of the F_{MSY} ratio) is 0.123. The product of the maximum permissible ABC harvest ratio and the geometric mean of the 2014 biomass estimate produced 2014 ABC of 239,800 t recommended by the author and Team, and the corresponding product using the OFL harvest ratio produces the 2014 OFL of 259,700 t. For 2015, the corresponding quantities are 248,300 t and 268,900 t, respectively.

Status determination

Yellowfin sole is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Ecosystem considerations

As in previous years, this assessment contains an ecosystem feature that represents catchability of the EBS shelf trawl survey as an exponential function of average annual bottom temperature.

5. Greenland turbot

Status and catch specifications (t) of Greenland turbot in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 1+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	76,900	11,700	9,660	8,660	4,720
	2013	81,000	2,540	2,060	2,060	1,747
	2014	84,546	2,647	2,124	n/a	n/a
	2015	96,298	3,864	3,173	n/a	n/a
Eastern Bering Sea	2012			7,230	6,230	3,063
	2013			1,610	1,610	1,437
	2014			1,659	n/a	n/a
	2015			2,478	n/a	n/a

Aleutian Islands	2012			2,430	2,430	1,657
	2013			450	450	310
	2014			465	n/a	n/a
	2015			695	n/a	n/a

Changes from previous assessment

This year's Greenland turbot assessment model included:

- updated 2013 catch data
- 2013 EBS shelf survey biomass
- 2013 ABL longline survey RPN
- 2013 EBS shelf survey and ABL longline length composition estimates
- 2010, 2011, 2012 shelf survey age data
- updated fishery catch-at-length data for longline and trawl gear from 2013.

No new models were explored nor any refinements made to last year's model due to the government shutdown.

Spawning biomass and stock status trends

The projected 2014 female spawning biomass is 22,010 t. This is a 17% decrease from the 2014 spawning biomass of 26,537 t projected in last year's assessment. Spawning biomass is projected to increase in 2015 to 27,624 t. While spawning biomass continues to decline as of 2013, large 2008 and 2009 year classes are still being observed in both the survey and fishery size composition data. These year classes are both estimated to be stronger than any other year class spawned since the 1970s. A near doubling of abundance in the 2012 slope survey estimate (relative to 2010) is largely attributable to an increase in small (30-50 cm) fish.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ exist for this stock. Greenland turbot therefore qualifies for management under Tier 3. Updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ from the present assessment are 39,906 t, 0.22, and 0.27, respectively. The stock remains in Tier 3b. The maximum permissible value of F_{ABC} under this tier translates into a maximum permissible ABC of 2,124 t for 2014 and 3,173 t for 2015, and a OFL of 2,647 t for 2014 and 3,864 t for 2015. These are the authors' and Team's ABC and OFL recommendations.

Status determination

Greenland turbot is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

6. Arrowtooth flounder

Status and catch specifications (t) of arrowtooth flounder in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year, except that the 2013 value was held constant at the 2012 value. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team and are taken from the 2011 assessment. Catch data are current through November 9, 2013.

Area	Year	Age 1+ Bio	OFL	ABC	TAC	Catch
BSAI	2012	1,130,000	181,000	150,000	25,000	22,714
	2013	1,130,000	186,000	152,000	25,000	20,158
	2014	1,023,440	125,642	106,599	n/a	n/a
	2015	995,494	125,025	106,089	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment. New input data include:

- fishery size composition for 2010 and 2011.
- updated 2012 catch and preliminary 2013.

Because this is an "off-year" for the BSAI ATF, new survey information is not incorporated into the assessment model for this update. Instead, a projection model is run with updated catch information. This projection model run incorporates the most recent catch and provides estimates of 2014 and 2015 ABC and OFL without re-estimating the stock assessment model parameters and biological reference points. The projection model is based on the previous year's model, except that it incorporates a new maturity ogive, which was approved by the Team in September.

Spawning biomass and stock status trends

The 2012 stock assessment model (using a different maturity schedule) resulted in a 2014 age 1+ biomass projection of 1,021,060 t, compared to 1,023,440 t from this year's assessment. The corresponding values for 2014 spawning biomass are 638,377 t (last year's assessment) and 626,319 t (this year's assessment). This year's assessment projects a slight increase in female spawning biomass between 2014 and 2015.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ exist for this stock. Arrowtooth flounder therefore qualifies for management under Tier 3. The point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ from last year's assessment were 246,476 t, 0.17, and 0.21, respectively; from this year's assessment, they are 231,015 t, 0.156, and 0.186, respectively. The projected 2014 spawning biomass is far above $B_{40\%}$ in both last year's and this year's assessments, so ABC and OFL recommendations for 2014 were calculated under sub-tier "a" of Tier 3. The authors and Team recommend setting F_{ABC} at the $F_{40\%}$ level, which is the maximum permissible level under Tier 3a, which results in 2014 and 2015 ABCs of 106,599 t and 106,089 t, respectively, and 2014 and 2015 OFLs of 125,642 t and 125,025 t.

Status determination

Arrowtooth flounder is a largely unexploited stock in the BSAI. Arrowtooth flounder is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Ecosystem Considerations

In contrast to the Gulf of Alaska, arrowtooth flounder is not at the top of the food chain on the EBS shelf. Arrowtooth flounder in the EBS is an occasional prey in the diets of groundfish, being eaten by Pacific cod, walleye pollock, Alaska skates, and sleeper sharks. However, given the large biomass of these species in the EBS overall, these occasionally recorded events translate into considerable total mortality for the arrowtooth flounder population in the EBS ecosystem.

7. Kamchatka flounder

Status and catch specifications (t) of Kamchatka flounder in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 1+ Bio	OFL	ABC	TAC	Catch
BSAI	2012	125,000	24,800	18,600	17,700	9,668
	2013	125,000	16,300	12,200	10,000	7,794
	2014	136,600	8,270	7,100	n/a	n/a
	2015	138,700	8,500	7,300	n/a	n/a

Prior to 2011, this species was a component of the arrowtooth flounder/Kamchatka flounder complex. Due to the development of a targeted fishery on Kamchatka flounder in 2009 and 2010, separate management of Kamchatka flounder from arrowtooth flounder began in 2011.

Changes from previous assessment

Although this stock was originally scheduled for an "off-year" assessment, the authors planned to provide a full assessment due to development of a revised age-structured model. However, as a result of the October government shutdown, only an executive summary was presented.

In 2011 and 2012, this stock was managed under Tier 5. An age-structured model was presented to the Team and SSC in September and October of 2012. The SSC did not accept the model, and recommended a large number of further evaluations. For 2013, the stock continued to be managed under Tier 5. The authors responded to the SSC's October 2013 recommendations in a preliminary assessment presented to the Team and SSC in September and October of this year. For this year's final assessment, the projection model was run, based on parameters and numbers at age from the age-structured model presented in the preliminary assessment.

New input data for the projection model included updating the 2012 catch and estimated values of the 2013 and 2014 catch. Results from the 2013 EBS shelf survey were not incorporated.

Spawning biomass and stock status trends

Kamchatka flounder has a widespread distribution along the deeper waters of the BSAI region and is believed to be increasing in abundance. Projected 2014 female spawning biomass is estimated at 50,400 t, above the $B_{40\%}$ level of 46,100 t, and is projected to remain above $B_{40\%}$.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The Team recommended using the age-structured model presented in September, the results of which form the basis for the projection model results presented in the SAFE chapter. Anticipating that the SSC will concur, Kamchatka flounder would be managed under Tier 3 for the first time. For the 2014 fishery,

the authors and Team recommended setting 2014 ABC at the maximum permissible value of 7,100 t from the projection model. This value is a decrease of 40% of the 2013 ABC (12,200 t) that was derived from Tier 5 methodology. The 2014 OFL from the projection model is 8,270 t, down from 16,300 t for 2013.

Status Determination

Assuming that the SSC will concur with the Team's recommendation to begin managing Kamchatka flounder under Tier 3, the stock is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Ecosystem considerations

Kamchatka flounder have rarely been found in the stomachs of other groundfish species in samples collected by the Alaska Fisheries Science Center. Pollock was the most important prey item for all sizes of Kamchatka flounder, ranging from 56 to 86 percent of the total stomach content weight. An examination of diet overlap with arrowtooth flounder indicated that these two congeneric species consume similar prey.

8. Northern rock sole

Status and catch specifications (t) of northern rock sole in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 6+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	1,860,000	231,000	208,000	87,000	76,098
	2013	1,470,000	241,000	214,000	92,380	59,040
	2014	1,393,200	228,700	203,800	n/a	n/a
	2015	1,299,600	213,310	190,100	n/a	n/a

Changes from previous assessment

Although this stock was scheduled for a full assessment, the chapter was presented in executive summary format due to the October government shutdown. Nevertheless, results from two models were included: last year's accepted model and an alternative that includes a relationship between temperature and survey catchability. The assessment models were not re-run. Instead, projections for both models were based on results from the 2012 assessment.

There were no changes to the input data.

Spawning biomass and stock status trends

The stock assessment model estimates a 2014 spawning biomass of 638,300 t. This was equal to the 2014 value projected in last year's assessment, due to the fact that there were no changes in the data. According to last year's assessment, spawning biomass is expected to increase due to strong 2000-2005 year classes, if fishing mortality rates remain at recent levels.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that northern rock sole qualifies for management under Tier 1. Spawning biomass for 2014 is projected to be well above B_{MSY}, placing northern rock sole in sub-tier "a" of Tier 1. The Tier 1 2014 ABC harvest recommendation is 203,800 t (F_{ABC} = 0.15) and the 2014 OFL is 228,700 t (F_{OFL} = 0.16). The 2015 ABC and OFL values are 190,100 t and 213,310 t, respectively.

This is a stable fishery that lightly exploits the stock because it is constrained by PSC limits and the BSAI optimum yield limit. Usually the fishery only takes a small portion of the northern rock sole ABC (the average catch/biomass ratio is about 4 percent).

Status determination

Northern rock sole is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

9. Flathead sole

Status and catch specifications (t) of flathead sole in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 3+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	811,000	84,500	70,400	34,100	11,381
	2013	748,454	81,500	67,900	22,699	16,713
	2014	745,237	79,633	66,293	n/a	n/a
	2015	744,631	77,023	64,127	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment. New information available to update the projection model for flathead sole consists of total catch for 2012 (11,386 t) and estimated catch for 2013 (17,246 t) and 2014 (assumed equal to 2013).

Spawning biomass and stock status trends

The projected spawning stock biomass for 2014 is 239,985 t. Flathead sole are abundant and only lightly exploited. In last year's assessment, spawning biomass was projected to decrease for the next several years.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ exist for this stock, thereby qualifying flathead sole for management under Tier 3. The current values of these reference points are $B_{40\%}$=128,286 t, $F_{40\%}$=0.285, and $F_{35\%}$=0.348. Because projected spawning biomass for 2014 (239,985 t) is above $B_{40\%}$, flathead sole is in sub-tier "a" of Tier 3. The authors and Team recommend setting ABCs for 2014 and 2015 at the maximum permissible values under Tier 3a, which are 66,293 t and 64,127 t, respectively. The 2014 and 2015 OFLs under Tier 3a are 79,633 t and 77,023 t, respectively.

Status determination

Flathead sole is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

10. Alaska plaice

Status and catch specifications (t) of Alaska plaice in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 3 + Bio	OFL	ABC	TAC	Catch
BSAI	2012	606,000	64,600	53,400	24,000	16,612
	2013	589,000	67,000	55,200	20,000	23,312
	2014	576,300	66,800	55,100	n/a	n/a
	2015	572,900	66,300	54,700	n/a	n/a

For 2013, NMFS plans to increase the Alaska plaice TAC with a reallocation from the non-specified reserves.

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

New input for the projection model included the final estimate of the 2012 catch and preliminary estimates of 2013 and 2014 catch.

The model assessment methodology was unchanged (only the projection model was run).

Spawning biomass and stock status trends

Female spawning biomass decreased from 1985 to 1998 and has been relatively stable since then. The shelf survey biomass has been fairly steady since the mid-1980s. There was exceptionally strong recruitment from the 2002 year class. There may also be a strong 2004 year class.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ exist for this stock, therefore qualifying it for management under Tier 3a. Last year's estimates (which were not updated this year) are $B_{40\%}$ = 152,000 t, $F_{40\%}$ = 0.158, and $F_{35\%}$ = 0.19. Given that the projected 2014 spawning biomass of 250,600 t exceeds $B_{40\%}$, the ABC and OFL recommendations for 2014 were calculated under sub-tier "a" of Tier 3. Projected harvesting at the $F_{40\%}$ level gives maximum permissible ABCs of 55,100 t and 54,700 t for 2014 and 2015, respectively. The author and Team recommended setting the ABCs at those values. The OFLs were determined from the Tier 3a formula, which gives a 2014 value of 66,800 t and a 2015 value of 66,300 t.

Status determination

Alaska plaice is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

11. Other Flatfish complex

Status and catch specifications (t) of other flatfish in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Total Bio.	OFL	ABC	TAC	Catch
BSAI	2012	111,000	17,100	12,700	3,200	3,524
	2013	114,000	17,800	13,300	3,500	1,516
	2014	107,500	16,700	12,400	n/a	n/a
	2015	107,500	16,700	12,400	n/a	n/a

In 2012, the other flatfish TAC increased to 3,600 t after a reallocation of 400 t from the non-specified reserves.

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

The assessment incorporates:

- preliminary 2013 catch and updated 2012 catch
- 2013 EBS shelf and slope and Aleutian Islands trawl survey biomass

The assessment methodology was unchanged.

Spawning biomass and stock status trends

Because this complex is managed under Tier 5, no models are available from which to predict future trends. Starry flounder, rex sole and butter sole comprise the majority of the fishery catch with a negligible amount of other species caught in recent years. Starry flounder continues to dominate the shelf survey biomass in the EBS and rex sole is the most abundant "other" flatfish in the Aleutian Islands. There is no consistent trend in the survey biomass of EBS butter sole over time. The 1982 butter sole estimate for the Eastern Bering Sea was 182 t compared to the 2013 estimate of 1,310 t, with values as high as 6,340 t in 1986 and as low as 37 t in 1983 (the median of the absolute value of the relative change from year to year is 59 percent). EBS starry flounder biomass increased from 7,780 t in 1982 to a high of 98,600 in 2007. This estimate has been decreasing since 2007 to 58,900 t in 2013. Conversely, EBS longhead dab decreased from a one-time high of 104,000 t in 1982 to 5,450 t in 2013. This estimate has fluctuated over time, though less dramatically from 1985 through the present. Longhead dab are found in inshore waters that are not normally sampled by the bottom trawl survey. Sakhalin sole biomass, which has no pattern in fluctuation, had a high of 1,410 t in 1997 and a low of 37 t in 2012. Sakhalin sole are primarily found north of the standard survey area. Distributional changes, onshore-offshore or north-south, might affect the survey biomass estimates of other flatfish.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has classified "other flatfish" as a Tier 5 species complex with harvest recommendations calculated from estimates of biomass and natural mortality. Natural mortality rates for rex (0.17) and Dover sole (0.085) in the GOA SAFE document are used, along with a value of 0.15 for all other species in the complex. Projected harvesting at the 0.75 M level (average F_{ABC} = 0.11), gives a 2014 ABC of 12,400 t for the "other flatfish" complex. The corresponding 2014 OFL (average F_{OFL} = 0.15) is 16,700 t.

Before the implementation of Amendment 80, fishing for this complex was usually closed for trawl gear prior to attainment of TAC because of the bycatch of Pacific halibut, a prohibited species. With the

implementation of Amendment 80, a higher TAC for "other" flatfish was assigned for 2007-2010, although it was subsequently decreased for 2011-2013.

Status determination

This assemblage is not being subjected to overfishing. It is not possible to determine whether this assemblage is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

12. Pacific ocean perch

Status and catch specifications (t) of Pacific ocean perch in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Team. Catch data are current through November 9, 2013.

Area	Year	Age 3+ Bio	OFL	ABC	TAC	Catch
BSAI	2012	594,000	35,000	24,700	24,700	21,837
	2013	663,000	41,900	35,100	35,100	28,049
	2014	639,505	39,585	33,122	n/a	n/a
	2015	620,270	37,817	31,641	n/a	n/a
Eastern Bering Sea	2012			5,710	5,710	5,590
	2013			8,130	8,130	1,707
	2014			7,684	n/a	n/a
	2015			7,340	n/a	n/a
Eastern Aleutian Islands	2012			5,620	5,620	5,519
	2013			9,790	9,790	9,530
	2014			9,246	n/a	n/a
	2015			8,833	n/a	n/a
Central Aleutian Islands	2012			4,990	4,990	4,799
	2013			6,980	6,980	6,747
	2014			6,594	n/a	n/a
	2015			6,299	n/a	n/a
Western Aleutian Islands	2012			8,380	8,380	8,236

	2013			10,200	10,200	10,065
	2014			9,598	n/a	n/a
	2015			9,169	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment. Therefore, only the projection model was run with updated catches. New data in the 2012 assessment included updated 2012 catch and estimated 2013 and 2014 catches.

No changes were made to the assessment model

Spawning biomass and stock status trends

The survey biomass estimates in the Aleutian Islands and the Bering Sea Slope both were high in 2012. New projections were very similar to last year's projections because observed catches were very similar to the estimated catches used last year. Spawning biomass is projected to be 257,878 t in 2014 and to decline to 243,400 t in 2015.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ exist for this stock, thereby qualifying Pacific ocean perch for management under Tier 3. The current estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ are 183,774 t, 0.063, and 0.076 respectively. Spawning biomass for 2014 (257,878 t) is projected to exceed $B_{40\%}$, thereby placing POP in sub-tier "a" of Tier 3. The 2014 and 2015 catches associated with the $F_{40\%}$ level of 0.063 are 33,122 t and 31,641 t, respectively, and are the authors' and Team's recommended ABCs. The 2014 and 2015 OFLs are 39,585 t and 37,817 t.

Area apportionment

The Team agreed with the author's recommendation that ABCs be set regionally based on the proportions in combined survey biomass as follows (values are for 2014): BS = 7,684 t, Eastern Aleutians (Area 541) = 9,246 t, Central Aleutians (Area 542) = 6,594 t, and Western Aleutians (Area 543) = 9,598 t. The recommended OFL for 2014 and 2015 is not regionally apportioned.

Status determination

Pacific ocean perch is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

13. Northern rockfish

Status and catch specifications (t) of northern rockfish in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 3+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	202,000	10,500	8,610	4,700	2,479
	2013	195,000	12,200	9,850	3,000	1,994
	2014	196,519	12,077	9,761	n/a	n/a
	2015	197,541	11,943	9,652	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment. Therefore, only the projection model is run with updated catches. New data in the 2013 assessment included updated 2012 catch, and estimated 2013 and 2014 catches.

No changes were made to the assessment model

Spawning biomass and stock status trends

Age 3+ biomass has been on an upward trend since 2002. Spawning biomass has been increasing slowly and almost continuously since 1977. Female spawning biomass is projected to be 84,237 t in 2014.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has determined that this stock qualifies for management under Tier 3 due to the availability of reliable estimates for $B_{40\%}$ (59,167 t), $F_{40\%}$ (0.063), and $F_{35\%}$ (0.079). Because the female spawning biomass of 84,237 t is greater than $B_{40\%}$, sub-tier "a" is applicable, with maximum permissible $F_{ABC} = F_{40\%}$ and $F_{OFL} = F_{35\%}$. Under Tier 3a, the maximum permissible ABC for 2014 is 9,761 t, which is the authors' and Team's recommendation for the 2014 ABC. Under Tier 3a, the 2014 OFL is 12,077 t for the Bering Sea/Aleutian Islands combined. The Team continues to recommend setting a combined BSAI OFL and ABC. The Team recommendation for 2015 ABC is 9,652 t and the 2015 OFL is 11,943 t.

Status determination

Northern rockfish is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

14. Blackspotted and rougheye rockfish

Status and catch specifications (t) blackspotted/rougheye rockfishes in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area/subarea	Year	Total Biomass (t)	OFL	ABC	TAC	Catch
BSAI	2012	24,900	576	475	475	201
	2013	29,800	462	378	378	341
	2014	30,400	505	416	n/a	n/a
	2015	31,400	580	478	n/a	n/a
Western/Central Aleutian Islands	2012			244	244	131
	2013			209	209	156
	2014			239	n/a	n/a
	2015			277	n/a	n/a
Eastern AI/ Eastern Bering Sea	2012			231	231	70
	2013			169	169	185
	2014			177	n/a	n/a
	2015			201	n/a	n/a

[1] Total biomass from AI age-structured projection model and survey biomass estimates from EBS.

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

New data included updated catch for 2012 and for 2013 through October 19, 2013.

The projection model for the Tier 3 component of the assessment was re-run using the results from last year's full assessment. Also, an alternative estimate of current biomass (using a random effects model) was provided for the Tier 5 component of the assessment.

Spawning biomass and stock status trend

Total biomass for the AI component of the stock in 2014 is projected to be 29,087 t. Female spawning biomass in the AI is increasing. Application of the random effects model reduces the estimated biomass of the EBS-SBS slope area to 1,389 t from 1,774 t.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

For the Aleutian Islands, this stock qualifies for management under Tier 3 due to the availability of reliable estimates for $B_{40\%}$, $F_{40\%}$ (=0.035), and $F_{35\%}$ (=0.043). Because the projected female spawning biomass for 2014 of 7,328 t is less than $B_{40\%}$, (10,502 t), the adjusted $F_{40\%}$ values for 2014 and 2015 are 0.024 and 0.026, respectively, and the corresponding adjusted $F_{35\%}$ values are 0.029 and 0.031. Under the Tier 3b formula, the maximum permissible ABC is 416 t, which is the authors' and Team's recommendation for the 2014 ABC. Under Tier 3b, the 2014 OFL is 505 t for the Bering Sea/Aleutian Islands combined. The apportionment of 2014 ABC to subareas is 239 t for the Western and Central Aleutian Islands and 177 t for the Eastern Aleutian Islands and Eastern Bering Sea. The Team recommendation for 2015 overall ABC is 478 t and the 2015 OFL is 580 t.

Status determination

The blackspotted and rougheye rockfish complex is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

15. Shortraker rockfish

Status and catch specifications (t) of shortraker rockfish in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Survey Biomass	OFL	ABC	TAC	Catch
BSAI	2012	17,500	524	393	393	348
	2013	16,450	493	370	370	420
	2014	16,447	493	370	n/a	n/a
	2015	16,447	493	370	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

The biomass estimate is based on the survey data through 2012.

There were no changes in the assessment methodology.

Spawning biomass and stock status trends

Estimated shortraker rockfish biomass is 16,447 t and has trended slowly downward since 1980.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has previously determined that reliable estimates only of biomass and natural mortality exist for shortraker rockfish, qualifying the species for management under Tier 5. The Tier 5 biomass estimate is based on a surplus production model. Last year, the Team recommended setting F_{ABC} at the maximum permissible level under Tier 5, which is 75 percent of M. The accepted value of M for this stock is 0.03

for shortraker rockfish, resulting in a $maxF_{ABC}$ value of 0.0225. The ABC is 370 for 2014 and 2015 and the OFL is 493 t 2014 and 2015, identical to the respective values for 2013.

Status determination

Shortraker rockfish is not being subjected to overfishing. It is not possible to determine whether this stock is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

16. Other Rockfish complex

Status and catch specifications (t) of other rockfish in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Survey Biomass	OFL	ABC	TAC	Catch
BSAI	2012	48,900	1,700	1,280	1,070	945
	2013	47,700	1,540	1,159	873	851
	2014	47,767	1,550	1,163	n/a	n/a
	2015	47,767	1,550	1,163	n/a	n/a
Eastern Bering Sea	2012	28,600	n/a	710	500	210
	2013	29,800	n/a	686	400	181
	2014	29,885	n/a	690	n/a	n/a
	2015	29,885	n/a	690	n/a	n/a
Aleutian Islands	2012	20,300	n/a	570	570	734
	2013	17,900	n/a	473	473	650
	2014	17,878	n/a	473	n/a	n/a
	2015	17,878	n/a	473	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

A small change in the average survey biomass occurred because of the inclusion of some unidentified rockfish, which were inadvertently omitted from last year's assessment.

New data in the 2013 assessment included updated catches for 2012 and 2013.

There were no changes in the assessment methodology.

Spawning biomass and stock status trends

Trends in spawning biomass are unknown. The 2012 assessment reported that biomass of other rockfish in the EBS slope survey was at an all-time high in 2012, while biomass in the AI was down relative to 2010, but still higher than pre-2002 levels.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The Team agrees with the approach recommended by the author of setting F_{ABC} at the maximum allowable under Tier 5 ($F_{ABC} = 0.75M$). Multiplying these rates by the best biomass estimates of shortspine thornyhead and other rockfish species in the "other rockfish" complex yields 2014 and 2015 ABCs of 690 t in the EBS and 473 t in the AI. The assessment uses a three survey weighted average to estimate biomass in similar fashion to the methodology used in the Gulf of Alaska rockfish assessments. The Team recommended that OFL be set for the entire BSAI area, which under Tier 5 is calculated by multiplying the best estimates of total biomass for the area by the separate natural mortality values and adding the results, which yields an OFL of 1,550 t for 2014 and 2015.

Status determination

The "other rockfish" complex is not being subjected to overfishing. It is not possible to determine whether this complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

17. Atka mackerel

Status and catch specifications (t) of Atka mackerel in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 3+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	405,000	96,500	81,400	50,763	47,831
	2013	289,000	57,700	50,000	25,920	23,180
	2014	384,364	74,492	64,131	n/a	n/a
	2015	387,308	74,898	64,477	n/a	n/a
Eastern Aleutian Islands/ Eastern Bering Sea	2012	n/a	n/a	38,500	38,500	37,313
	2013	n/a	n/a	16,900	16,900	15,776
	2014	n/a	n/a	21,652	n/a	n/a
	2015	n/a	n/a	21,769	n/a	n/a
Central Aleutian Islands	2012	n/a	n/a	22,900	10,763	10,323
	2013	n/a	n/a	16,000	7,520	7,284
	2014	n/a	n/a	20,574	n/a	n/a
	2015	n/a	n/a	20,685	n/a	n/a

Western Aleutian Islands	2012	n/a	n/a	20,000	1,500	195
	2013	n/a	n/a	17,100	1,500	120
	2014	n/a	n/a	21,905	n/a	n/a
	2015	n/a	n/a	22,023	n/a	n/a

Changes from previous assessment

The following new data were included in this year's assessment:

- updated fishery catch data
- 2012 fishery and Aleutian Islands survey age data
- the average fishery selectivity vector from the most recent 5-year period (2009-2013) was used for projections

As in last year's assessment, it was assumed that only 64% of the BSAI-wide ABC for the next two years would be taken under the Steller Sea Lion Interim Final Rule Reasonable and Prudent Alternatives (SSL RPAs). This percentage was applied to the 2014 maximum permissible ABC, and that amount was assumed to be caught in order to estimate the 2015 ABC and OFL. Adding 2012 age data increased the estimated sizes of the 1999-2001 and 2007 year classes which increased estimates of biomass reference points by ~4%.

Spawning biomass and stock status trends

The projected female spawning biomass for 2014 using the catch levels in the proposed SSL RPAs is 117,171 t, which is above $B_{40\%}$ (116,411 t). The population is projected to fall below $B_{40\%}$ in 2015, assuming the catch reductions contained in the proposed SSL RPAs occur and remain in place.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The projected female spawning biomass under the SSL RPA harvest strategy is estimated to be above $B_{40\%}$, thereby placing BSAI Atka mackerel in Tier 3a**.** The projected 2014 yield (ABC) at $F_{40\%}$= 0.421 is 64,131 t, up 28% from the 2013 ABC of 50,000 t. The projected 2014 overfishing level at $F_{35\%}$ = 0.514 is 74,492 t, up 29% from last year's estimate for 2013 (57,700 t). The increases in fishing mortality rates and yields are due to a combination of factors, including additional age information that increased the estimated sizes of three large year classes in the population, changes in the selectivity vector, and moving from tier 3b to 3a.

Status determination

Atka mackerel is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Area apportionment

Amendment 28 of the Bering Sea/Aleutian Islands Fishery Management Plan divided the Aleutian Islands subarea into 3 districts at 177° E and 177° W longitude, providing the mechanism to apportion the Aleutian Atka mackerel TACs. The Council uses a 4-survey weighted average to apportion the ABC, and the last 4 surveys were conducted in 2004, 2006, 2010, and 2012. The recommended ABC apportionment by subarea for 2014 are 21,652 t for Area 541 and the southern Bering Sea region, 20,574 t for Area 542, and 21,905 t for Area 543.

Ecosystem Considerations

Atka mackerel is the most common prey item of the endangered western Steller sea lion throughout the year in the Aleutian Islands. Analysis of historic fishery CPUE revealed that the fishery may create temporary localized depletions of Atka mackerel, and fishery harvest rates in localized areas may have been high enough to affect prey availability for Steller sea lions. The objectives of having areas closed to Atka mackerel fishing around Steller sea lion haulouts and rookeries, and time-area ABC allocations are to maintain sufficient prey for the recovery of Steller sea lions in the Aleutian Islands while also harvesting Atka mackerel. The stock assessment indicates that the abundance of Atka mackerel is decreasing, and peaked in 2005 due to four back-to-back strong year classes (1998-2001), including an extraordinarily strong 1999 year class which still persists in the population. Nevertheless, Steller sea lion surveys conducted in 2008-12 indicate that counts of adults, juveniles, and pups continue to decline in the Aleutian Islands west of Tanaga Pass. This contrasts with Steller sea lion counts in the eastern Aleutian Islands and southern Bering Sea (between Samalga and False Passes) which are increasing. Interim final regulations enacted in 2011 prohibit any retention of Atka mackerel in area 543 (the western Aleutian Islands, where the Steller sea lion population is declining at ~7 percent per year); prohibit directed Atka mackerel fishing in most of Steller sea lion critical habitat in area 542 (all except an area between 178-179°W (Tanaga Pass) which has catch and effort restrictions); set the area 542 Atka mackerel TAC to no more than 47 percent of the Area 542 ABC; retain the critical habitat closure in area 541; and close the entire eastern Bering Sea to directed fishing for Atka mackerel.

18. Skates

Status and catch specifications (t) of skates in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Age 0+ Biomass	OFL	ABC	TAC	Catch
BSAI	2012	645,000	39,100	32,600	24,700	24,819
	2013	745,000	45,800	38,800	24,000	24,928
	2014	698,204	41,849	39,746	n/a	n/a
	2015	674,469	35,383	33,545	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

The following new data were included in this year's assessment:

- updated 2012 and preliminary 2013 catch
- 2013 EBS shelf survey data

No changes were made to the assessment model. The projection model was re-run with the most recent catch data. The 2013 EBS shelf survey data were presented in the chapter, but were not used to update the estimate of current biomass for the Tier 5 component of the assemblage.

Spawning biomass and stock status trends

The 2013 biomass estimates from the shelf survey increased slightly from 2012. In the case of Alaska skates, survey biomass estimates, though variable, are basically trendless since species identification began in 1999. Model estimates of spawning biomass are also basically trendless over the 1992-2011 period covered by the model.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Since 2011, the Alaska skate portions of the ABC and OFL have been specified under Tier 3, while the "other skates" portions have been specified under Tier 5.

Because projected spawning biomass for 2014 (185,076 t) exceeds $B_{40\%}$ (106,724 t), Alaska skates are managed in sub-tier "a" of Tier 3. Other reference points are $maxF_{ABC} = F_{40\%} = 0.098$ and $F_{OFL} = F_{35\%} = 0.113$. The Alaska skate portions of the 2014 and 2015 ABCs are 28,282 t and 26,444 t, and the Alaska skate portions of the 2014 and 2015 OFLs are 32,381 t and 30,278 t. The "other skates" component is assessed under Tier 5, based on a natural mortality rate of 0.10 and a biomass estimated as the average of the three most recent surveys. The "other skates" portion of the 2014-2015 ABC is 7,100 for both years, and the "other skates" portion of the 2014-2015 OFL is 9,468 t for both years.

For the skate complex as a whole, OFLs for 2014 and 2015 total 41,849 t and 39,746 t, respectively, and ABCs for 2014 and 2015 total 35,383 t and 33,545 t, respectively.

Status determination

Alaska skate, which may be viewed as an indicator stock for the complex, is not overfished and is not approaching an overfished condition. The skate complex was not subjected to overfishing. It is not possible to determine whether the other skates complex is overfished or approaching an overfished condition because it is managed under Tier 5.

19. Sculpins

Status and catch specifications (t) of sculpins in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Biomass	OFL	ABC	TAC	Catch
BSAI	2012	208,000	58,300	43,700	5,200	5,796
	2013	215,713	56,400	42,300	5,600	5,547
	2014	215,713	56,424	42,318	n/a	n/a
	2015	215,713	56,424	42,318	n/a	n/a

In 2012, the sculpins TAC increased to 5,750 t after a reallocation of 550 t from the non-specified reserves.

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

Species catch data from 2003-2012 were updated as a result of changes to the catch accounting system.

Spawning biomass and stock status trends

Biomass estimates for 6 of the most abundant sculpin species on the EBS shelf seem to be relatively stable and comprise 95% of the total sculpin biomass. In addition, the distribution decreased slightly on the EBS shelf but increased on the EBS slope and in the AI. EBS slope trawl surveys conducted since 2002 show a different sculpin community than seen on the EBS shelf and AI.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The authors have recommended the use of an average *M* rate using a biomass-weighted average of the instantaneous natural mortality rates for the six most abundant sculpin species in the BSAI. The complex

mortality rate may change as new survey data become available. The total (Tier 5) sculpin recommended ABCs and OFLs for 2014 and 2015 are 42,318 t and 56,424 t, respectively.

Status determination

The sculpin complex is not being subjected to overfishing. It is not possible to determine whether the sculpin complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

20. Sharks

Status and catch specifications (t) of sharks in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Biomass	OFL	ABC	TAC	Catch
BSAI	2012	n/a	1,360	1,020	200	95
	2013	n/a	1,360	1,020	100	85
	2014	n/a	1,363	1,022	n/a	n/a
	2015	n/a	1,363	1,022	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

The executive summary has updated catch data, which for 2013 include the first estimates of shark bycatch in the halibut fishery based on observer data. BSAI sharks are in Tier 6, with OFL and ABC set on the basis of maximum catch over the years 1997-2007. (The small differences in the table above result from different rounding practices.)

The remainder of this section is carried over from last year's SAFE report.

Spawning biomass and stock status trends

The bulk of the shark catch in the BSAI is sleeper sharks, taken mainly in the pollock and Pacific cod fisheries. Small numbers of salmon sharks are taken in the pollock fishery, but they are pelagic and mostly invulnerable to groundfish fisheries. Few dogfish sharks appear this far north. In the period 1997-2010 the average annual catch of all sharks was 500 t. Catches have been below average in the last few years.

Trawl survey data do not provide reliable estimates of abundance of sharks in the BSAI. Sharks are seldom caught in BSAI trawl surveys except for the Bering Sea slope survey, where sleeper sharks occur in about 10 percent of hauls. They are also taken in the Bering Sea shelf and Aleutian Islands surveys, but rarely. Averaging the swept area estimates of sleeper sharks in all surveys over the last ten years produces a value of about 10,000 t, which is likely an underestimate.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has placed sharks in Tier 6, where OFL and ABC are typically based on historical catches. Consistent with past policy, the Team recommended setting OFL at the maximum catch during the period 1997-2007 (1,363 t, taken in 2002), and ABC at 75 percent of OFL, which continues to be 1,022 t.

Status determination

The shark complex is not being subjected to overfishing. It is not possible to determine whether this species complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 6.

The Team is concerned about the steep decline of sleeper shark catch rates in the IPHC longline survey and all of the bycatch fisheries. However since all sleeper sharks taken in the survey and fisheries are juveniles, it is impossible to know what effect those catches have on spawning stock biomass.

21. Squids

Status and catch specifications (t) of squid in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Biomass	OFL	ABC	TAC	Catch
BSAI	2012	n/a	2,620	1,970	425	688
	2013	n/a	2,620	1,970	700	298
	2014	n/a	2,624	1,970	n/a	n/a
	2015	n/a	2,624	1,970	n/a	n/a

In 2012, the squids TAC increased to 700 t after a reallocation of 275 t from the non-specified reserves.

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

The author included new information in the assessment that described the seasonal pattern of incidental squid catches, including length and geographical distribution of catch.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Squids are managed under Tier 6 because the groundfish bottom trawl surveys do not provide reliable biomass estimates. The Team concurred with the author's ABC and OFL recommendations for 2014 and 2015, which are unchanged from last year. The recommended ABCs for 2014 and 2015 are the maximum permissible level, calculated as 0.75 times the average catch from the reference period of 1978-1995, or 1,970 t. The recommended OFLs in 2014 and 2015 are calculated as the average catch from 1978-1995, or 2,624 t.

Status determination

The squid complex is not being subjected to overfishing. It is not possible to determine whether this species complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 6.

22. Octopus

Status and catch specifications (t) of octopus in recent years. Biomass for each year corresponds to the projection given in the SAFE report issued in the preceding year. The OFL and ABC for 2014 and 2015 are those recommended by the Plan Team. Catch data are current through November 9, 2013.

Area	Year	Biomass	OFL	ABC	TAC	Catch
BSAI	2012	n/a	3,450	2,590	900	138
	2013	n/a	3,450	2,590	500	195
	2014	n/a	3,450	2,590	n/a	n/a
	2015	n/a	3,450	2,590	n/a	n/a

Changes from previous assessment

This chapter was presented in executive summary format, as a scheduled "off-year" assessment.

No changes were made in the methodology for assessing octopus based on consumption of octopus by Pacific cod. The consumption estimate using Pacific cod predation of octopus as an estimator of biomass lost due to natural mortality first was accepted in 2011; the authors recommended that this calculation be revisited once every five years.

The following new data were included in this year's assessment:

- updated 2012 and preliminary 2013 catch
- 2013 EBS shelf survey data

Spawning biomass and stock status trends

Estimated survey biomass was lower in 2013 than in the most recent surveys of the Bering Sea shelf. Species composition and size frequencies from the surveys were similar to previous years.

On the EBS shelf and in the commercial catch, giant Pacific octopus is the most abundant of at least seven octopus species found in the BSAI. Octopuses are commonly caught in pot and trawl fisheries, especially in the Pacific cod pot fishery. Trawl surveys sample octopus poorly, and biomass estimates from trawl surveys are not considered reliable.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The ABC and OFL values were determined under Tier 6. Usually, Tier 6 specifications are based on average catch, but starting in 2012, the assessment authors recommended setting harvest specifications using an alternative mortality estimate based on species composition of Bering Sea Pacific cod diet from 1984-2008 survey data and weight-at-age data. This method is also recommended for 2014 and 2015. This consumption estimate results in 2014 and 2015 OFLs of 3,450 t and ABCs of 2,590 t. The Team recommended adoption of these specifications.

Status determination

The octopus complex is not being subjected to overfishing. It is not possible to determine whether the octopus complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 6.

Appendix 1: Grenadiers

An executive summary of the grenadier assessment is provided in Appendix 1; while not required, it is provided to assist the Council in its pending decision of whether to include the assemblage in the groundfish FMPs.

Seven species of grenadiers are known to occur in Alaska. The giant grenadier is the most abundant and has the shallowest depth distribution on the continental slope. The assessment focused on the giant grenadier as it is the most common grenadier caught in both the commercial fishery and longline and trawl surveys. Pacific grenadiers and popeye grenadiers are occasionally caught.

The estimated annual catches of grenadiers in Alaska for the years 1997-2012 ranged between 11,700-21,300 t, with an average for this period of 15,400 t. Thus far in 2013 the catch is 14,374 t. Highest catches have consistently been in the GOA. By region, annual catches have ranged between 5,400-14,700 t in the GOA, 1,600-5,000 t in the EBS, and 1,300-4,600 t in the AI. Most of the catch occurs in longline and pot fisheries.

Changes in assessment methodology and data

There were no changes in the assessment methodology.

New data for this assessment includes: 1) updated catch estimates for 2012-2013; 2) trawl survey results for the GOA in 2013; and 3) NMFS longline survey results for the GOA and EBS in 2013.

Tier determination and resulting ABCs and OFLs

If the complex had been included in the fishery under the FMPs in 2014, Tier 5 determinations would have resulted in OFLs and ABCs of 46,200 t and 32,400 t for the EBS and 89,000 t and 35,000 t for the AI.

The above calculations are based on the average of the three most recent deep-water trawl surveys that sampled to at least 1,000 m, and $M = 0.078$. This includes the 2008, 2010, and 2012 EBS trawl surveys and the 2005, 2007, and 2009 GOA trawl surveys. Because biomass estimates are only available in the Aleutian Islands down to 500 m, a ratio of "shallow" biomass estimates from the trawl survey (1-500 m) to "shallow" relative population weights from the longline survey (1-500 m) is used to extrapolate total biomass from longline survey RPWs for 1-1000 m. The ABC and OFL values are the same as provided in 2012 as no new biomass estimates are available for the deep trawl survey strata (700 -1000 m).

Appendix 2: Forage fish

The preliminary forage fish assessment is provided in Appendix 2. The forage fish category in the BSAI Groundfish FMP includes the following species or groups of species: 1) more than 50 species in the "forage fish group" that are listed in an appendix of the assessment; 2) Pacific herring *Clupea pallasii*; 3) juvenile groundfishes and salmon; 4) shrimps; 5) squids; and 6) Arctic cod *Boreogadus saida*.

Species in the forage fish category have been identified as having ecological importance as prey, and directed fishing is prohibited for the group. As of 2011, the forage fish category in the BSAI Groundfish FMP is managed as an "ecosystem component." A preliminary assessment of forage fish was completed this year. Updated assessments will be provided on a biennial cycle.

Table 1. BSAI Groundfish Plan Team Recommendations for Final OFLs and ABCs (mt) for 2014 and 2015.

		2013				2014		2015	
Species	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**OFL**	**ABC**
Pollock	EBS	2,550,000	1,375,000	1,247,000	1,267,963	2,795,000	1,369,000	2,693,000	1,258,000
	AI	45,600	37,300	19,000	2,964	42,811	35,048	47,713	39,412
	Bogoslof	13,400	10,100	100	57	13,413	10,059	13,413	10,059
Pacific cod	BSAI	359,000	307,000	260,000	221,396	n/a	n/a	n/a	n/a
	BS	n/a	n/a	n/a	212,676	299,000	255,000	319,000	272,000
	AI	n/a	n/a	n/a	8,720	20,100	15,100	22,500	16,900
Sablefish	BS	1,870	1,580	1,580	640	1,584	1,339	1,432	1,210
	AI	2,530	2,140	2,140	1,090	2,141	1,811	1,936	1,636
Yellowfin sole	BSAI	220,000	206,000	198,000	156,302	259,700	239,800	268,900	248,300
Greenland turbot	BSAI	2,540	2,060	2,060	1,747	2,647	2,124	3,864	3,173
	BS	n/a	1,610	1,610	1,437	n/a	1,659	n/a	2,478
	AI	n/a	450	450	310	n/a	465	n/a	695
Arrowtooth flounder	BSAI	186,000	152,000	25,000	20,158	125,642	106,599	125,025	106,089
Kamchatka flounder	BSAI	16,300	12,200	10,000	7,794	8,270	7,100	8,500	7,300
Northern rock sole	BSAI	241,000	214,000	92,380	59,040	228,700	203,800	213,310	190,100
Flathead sole	BSAI	81,500	67,900	22,699	16,713	79,633	66,293	77,023	64,127
Alaska plaice	BSAI	67,000	55,200	20,000	23,312	66,800	55,100	66,300	54,700
Other flatfish	BSAI	17,800	13,300	3,500	1,516	16,700	12,400	16,700	12,400
Pacific ocean perch	BSAI	41,900	35,100	35,100	28,049	39,585	33,122	37,817	31,641
	BS	n/a	8,130	8,130	1,707	n/a	7,684	n/a	7,340
	EAI	n/a	9,790	9,790	9,530	n/a	9,246	n/a	8,833
	CAI	n/a	6,980	6,980	6,747	n/a	6,594	n/a	6,299
	WAI	n/a	10,200	10,200	10,065	n/a	9,598	n/a	9,169
Northern rockfish	BSAI	12,200	9,850	3,000	1,994	12,077	9,761	11,943	9,652
Blackspotted/Rougheye rockfishes	BSAI	462	378	378	341	505	416	580	478
	EBS/EAI	n/a	169	169	185	n/a	177	n/a	201
	CAI/WAI	n/a	209	209	156	n/a	239	n/a	277
Shortraker rockfish	BSAI	493	370	370	420	493	370	493	370
Other rockfish	BSAI	1,540	1,159	873	851	1,550	1,160	1,550	1,160
	BS	n/a	686	400	181	n/a	690	n/a	690
	AI	n/a	473	473	670	n/a	473	n/a	473
Atka mackerel	BSAI	57,700	50,000	25,920	23,180	74,492	64,131	74,898	64,477
	EAI/BS	n/a	16,900	16,900	15,776	n/a	21,652	n/a	21,769
	CAI	n/a	16,000	7,520	7,284	n/a	20,574	n/a	20,685
	WAI	n/a	17,100	1,500	120	n/a	21,905	n/a	22,023
Skates	BSAI	45,800	38,800	24,000	24,928	41,849	35,383	39,746	33,545
Sculpins	BSAI	56,400	42,300	5,600	5,547	56,424	42,318	56,424	42,318
Sharks	BSAI	1,360	1,020	100	85	1,363	1,022	1,363	1,022
Squids	BSAI	2,620	1,970	700	298	2,624	1,970	2,624	1,970
Octopuses	BSAI	3,450	2,590	500	195	3,450	2,590	3,450	2,590
Total	BSAI	4,028,465	2,639,317	2,000,000	1,866,580	4,196,553	2,572,819	4,109,504	2,474,632

Final 2013 OFLs, ABCs, and TACs from 2013-2014 final harvest specifications, as revised; total catch updated through November 9, 2013.

Table 2. Groundfish catches (metric tons) in the eastern Bering Sea, 1954-2013.

Year	Pollock	Pacific Cod	Sable Fish	Yellowfin Sole	Greenland Turbot	Arrowtooth Flounder/a	Kamchatka Flounder/d	Rock Sole/c	Flathead sole	Alaska Plaice	Other Flatfish	Pacific Ocean Perch Complex/b	Pacific Ocean Perch	Northern Rockfish	Blackspotted /Rougheye Rockfish	Shortraker Rockfish	Other Rockfish	Atka Mackerel	Other Species	Skates	Sculpins	Sharks	Squids	Octopus	Total (All Species)
1954				12,562																					12,562
1955				14,690																					14,690
1956				24,697																					24,697
1957				24,145																					24,145
1958	6,924	171	6	44,153															147						51,401
1959	32,793	2,864	289	185,321															380						221,647
1960			1,861	456,103	36,843							6,100													500,907
1961			15,627	553,742	57,348							47,000													673,717
1962			25,989	420,703	58,226							19,900													524,818
1963			13,706	85,810	31,565						35,643	24,500													191,224
1964	174,792	13,408	3,545	111,177	33,729						30,604	25,900							736						393,891
1965	230,551	14,719	4,838	53,810	9,747						11,686	16,800							2,218						344,369
1966	261,678	18,200	9,505	102,353	13,042						24,864	20,200							2,239						452,081
1967	550,362	32,064	11,698	162,228	23,869						32,109	19,600							4,378						836,308
1968	702,181	57,902	4,374	84,189	35,232						29,647	31,500							22,058						967,083
1969	862,789	50,351	16,009	167,134	36,029						34,749	14,500							10,459						1,192,020
1970	1,256,565	70,094	11,737	133,079	19,691	12,598					64,690	9,900							15,295						1,593,649
1971	1,743,763	43,054	15,106	160,399	40,464	18,792					92,452	9,800							13,496						2,137,326
1972	1,874,534	42,905	12,758	47,856	64,510	13,123					76,813	5,700							10,893						2,149,092
1973	1,758,919	53,386	5,957	78,240	55,280	9,217					43,919	3,700							55,826						2,064,444
1974	1,588,390	62,462	4,258	42,235	69,654	21,473					37,357	14,000							60,263						1,900,092
1975	1,356,736	51,551	2,766	64,690	64,819	20,832					20,393	8,600							54,845						1,645,232
1976	1,177,822	50,481	2,923	56,221	60,523	17,806					21,746	14,900							26,143						1,428,565
1977	978,370	33,335	2,718	58,373	27,708	9,454					14,393	2,654					311		35,902				4,926		1,168,144
1978	979,431	42,543	1,192	138,433	37,423	8,358					21,040	2,221					2,614	831	61,537				6,886		1,302,509
1979	913,881	33,761	1,376	99,017	34,998	7,921					19,724	1,723					2,108	1,985	38,767				4,286		1,159,547
1980	958,279	45,861	2,206	87,391	48,856	13,761					20,406	1,097					459	4,955	34,633				4,040		1,221,944
1981	973,505	51,996	2,604	97,301	52,921	13,473					23,428	1,222					356	3,027	35,651				4,182		1,259,666
1982	955,964	55,040	3,184	95,712	45,805	9,103					23,809	224					276	328	18,200				3,838		1,211,483
1983	982,363	83,212	2,695	108,385	43,443	10,216					30,454	221					220	141	15,465				3,470		1,280,285
1984	1,098,783	110,944	2,329	159,526	21,317	7,980					44,286	1,569					176	57	8,508				2,824		1,458,299
1985	1,179,759	132,736	2,348	227,107	14,698	7,288					71,179	784					92	4	11,503				1,611		1,649,109
1986	1,188,449	130,555	3,518	208,597	7,710	6,761					76,328	560					102	12	10,471				848		1,633,911
1987	1,237,597	144,539	4,178	181,429	6,533	4,380					50,372	930					474	12	8,569				108		1,639,121
1988	1,228,000	192,726	3,193	223,156	6,064	5,477					137,418	1,047					341	428	12,206				414		1,810,470
1989	1,230,000	164,800	1,252	153,165	4,061	3,024					63,452	2,017					192	3,126	4,993				300		1,630,382
1990	1,353,000	162,927	2,329	80,584	7,267	2,773					22,568	5,639					384	480	5,698				460		1,644,109
1991	1,268,360	165,444	1,128	94,755	3,704	12,748		46,681			30,401	4,744					396	2,265	16,285				544		1,647,455
1992	1,384,376	163,240	558	146,942	1,875	11,080		51,720			34,757	3,309					675	2,610	29,993				819		1,831,954
1993	1,301,574	133,156	669	105,809	6,330	7,950		63,942			28,812	3,763					190	201	21,413				597		1,674,406
1994	1,362,694	174,151	699	144,544	7,211	13,043		60,276			29,720	1,907					261	190	23,430				502		1,818,628
1995	1,264,578	228,496	929	124,746	5,855	8,282		54,672	14,699		20,165	1,210					629	340	20,928				364		1,745,893
1996	1,189,296	209,201	629	129,509	4,699	13,280		46,775	17,334		18,529	2,635					364	780	19,717				1,080		1,653,828
1997	1,115,268	209,475	547	166,681	6,589	8,580		67,249	20,656		22,957	1,060					161	171	20,997				1,438		1,641,829
1998	1,101,428	160,681	586	101,310	8,303	14,985		33,221	24,550		15,355	1,134					203	901	23,156				891		1,486,704
1999	988,703	146,738	678	69,275	5,401	10,585		40,505	18,534		15,515	654					141	2,267	18,916				392		1,318,304
2000	1,132,736	151,372	742	84,057	5,888	12,071		49,186	20,342		16,453	704					239	239	23,098				375		1,497,502
2001	1,387,452	142,452	863	63,563	4,252	12,836		28,949	17,757		9,930	1,148					296	264	23,148				1,761		1,694,671
2002	1,481,815	166,552	1,143	74,956	3,150	10,821		40,700	15,464		2,588	858					401	572	26,639				1,334		1,826,993
2003	1,492,039	174,687	1,039	81,050	2,565	13,667		36,375	14,132	10,118	2,922	1,391					336	6,362	26,986				1,246		1,864,915
2004	1,480,543	183,283	1,038	75,501	1,825	17,333		47,862	17,354	7,888	4,755		731	116	24	119	318	7,159	27,496				1,000		1,874,344
2005	1,483,286	182,938	1,064	94,382	2,140	13,408		36,814	16,074	11,194	4,566		879	112	12	108	178	3,540	28,066				1,170		1,879,931
2006	1,486,648	168,265	1,036	99,134	1,452	11,911		35,878	17,934	17,318	3,123		1,042	247	7	48	157	3,175	24,865				1,403		1,873,644
2007	1,354,492	140,079	1,173	120,966	1,481	11,080		36,364	19,086	19,522	5,764		870	69	10	113	219	3,021	24,779				1,175		1,740,263
2008	990,576	139,604	1,125	148,894	1,925	19,357		50,935	24,520	17,377	3,578		513	22	29	58	209	398	27,063				1,493		1,427,676
2009	810,743	147,166	891	107,512	2,249	19,676		48,145	19,535	13,944	2,131		623	48	12	83	204	244	25,358				269		1,198,833
2010	810,395	142,859	754	118,624	2,272	15,265		52,645	20,097	16,165	2,154		3,547	299	34	181	263	151	20,670				305		1,206,680
2011	1,199,243	209,264	695	151,166	3,111	17,324	4,445	60,353	13,549	23,656	3,121		5,600	198	39	103	324	1,210		22,414	4,860	101	237	576	1,721,589
2012	1,205,338	232,832	740	147,186	3,063	19,311	2,645	75,776	11,369	16,612	3,482		5,590	91	18	120	210	972		23,739	4,989	93	560	127	1,754,861
2013	1,268,019	212,676	640	156,302	1,437	13,687	2,094	58,830	16,702	23,312	1,474		1,707	93	32	127	181	146		23,861	4,947	81	157	156	1,786,661

a/ Arrowtooth flounder included in Greenland turbot catch statistics, 1960-69.

b/ Includes POP shortraker, rougheye, northern, and sharpchin.

c/ Rock sole prior to 1991 and flathead sole prior to 1995 are included in other flatfish catch statistics.

d/ Kamchatka flounder included in Arrowtooth flounder prior to 2011.

e/ Data through November 9, 2013.

f/ Octopus, sculpin, sharks, skates included in Other species prior to 2011.

Note: Numbers don't include fish taken for research.

Table 3. Groundfish catches (metric tons) in the Aleutian Islands, 1954-2013.

Year	Pollock	Pacific Cod	Sable Fish	Yellowfin Sole	Greenland Turbot	Arrowtooth Flounder/a	Kamchatka Flounder/d	Rock Sole/c	Flathead sole	Alaska Plaice	Other Flatfish	Pacific Ocean Perch Complex/b	Pacific Ocean Perch	Northern Rockfish	Blackspotted /Rougheye Rockfish	Shortraker Rockfish	Other Rockfish	Atka Mackerel	Other Species	Skates	Sculpins	Sharks	Squids	Octopus	Total (All Species)
1954																									0
1955																									0
1956																									0
1957																									0
1958																									0
1959																									0
1960																									0
1961																									0
1962												200													200
1963			664		7							20,800													21,471
1964		241	1,541		504							90,300							66						92,652
1965		451	1,249		300							109,100							768						111,868
1966		154	1,341		63							85,900							131						87,589
1967		293	1,652		394							55,900							8,542						66,781
1968		289	1,673		213							44,900							8,948						56,023
1969		220	1,673		228							38,800							3,088						44,009
1970		283	1,248		285	274						66,900						949	10,671						80,610
1971		2,078	2,936		1,750	581						21,800							2,973						32,118
1972		435	3,531		12,874	1,323						33,200						5,907	22,447						79,717
1973		977	2,902		8,666	3,705						11,800						1,712	4,244						34,006
1974		1,379	2,477		8,788	3,195						22,400						1,377	9,724						49,340
1975		2,838	1,747		2,970	784						16,600						13,326	8,288						46,553
1976		4,190	1,659		2,067	1,370						14,000						13,126	7,053						43,465
1977	7,625	3,262	1,897		2,453	2,035						8,080					3,043	20,975	16,170				1,808		67,348
1978	6,282	3,295	821		4,766	1,782						5,286					921	23,418	12,436				2,085		61,092
1979	9,504	5,593	782		6,411	6,436						5,487					4,517	21,279	12,934				2,252		75,195
1980	58,156	5,788	274		3,697	4,603						4,700					420	15,533	13,028				2,332		108,531
1981	55,516	10,462	533		4,400	3,640						3,622					328	16,661	7,274				1,763		104,199
1982	57,978	1,526	955		6,317	2,415						1,014					2,114	19,546	5,167				1,201		98,233
1983	59,026	9,955	673		4,115	3,753						280					1,045	11,585	3,675				510		94,617
1984	81,834	22,216	999		1,803	1,472						631					56	35,998	1,670				343		147,022
1985	58,730	12,690	1,448		33	87						308					99	37,856	2,050				9		113,310
1986	46,641	10,332	3,028		2,154	142						286					169	31,978	1,509				20		96,259
1987	28,720	13,207	3,834		3,066	159						1,004					147	30,049	1,155				23		81,364
1988	43,000	5,165	3,415		1,044	406						1,979					278	21,656	437				3		77,383
1989	156,000	4,118	3,248		4,761	198						2,706					481	14,868	108				6		186,494
1990	73,000	8,081	2,116		2,353	1,459						14,650					864	21,725	627				11		124,886
1991	78,104	6,714	2,071	1,380	3,174	938					88	2,545					549	22,258	91				30		117,942
1992	54,036	42,889	1,546	4	895	900		236			68	10,277					3,689	46,831	3,081				61		164,513
1993	57,184	34,234	2,078	0	2,138	1,348		318			59	13,375					495	65,805	2,540				85		179,659
1994	58,708	22,421	1,771	0	3,168	1,334		308			55	16,959					301	69,401	1,102				86		175,614
1995	64,925	16,534	1,119	6	2,338	1,001		356	16		31	14,734					220	81,214	1,273				95		183,862
1996	28,933	31,389	720	654	1,677	1,330		371	10		51	20,443					278	103,087	1,720				87		190,750
1997	26,872	25,166	779	234	1,077	1,071		271	32		7	15,687					307	65,668	1,555				323		139,049
1998	23,821	34,964	595	5	821	694		446	19		35	13,729					385	56,195	2,448				25		134,182
1999	981	28,117	671	13	460	774		580	34		20	18,501					657	53,966	1,670				9		106,453
2000	1,244	39,684	1,070	13	1,086	1,157		480	80		32	14,893					601	46,990	3,010				8		110,348
2001	824	34,207	1,074	15	1,060	1,220		526	54		43	15,587					610	61,296	4,029				5		120,550
2002	1,177	30,801	1,118	29	485	1,032		1,165	111		39	14,996					551	44,722	1,980				10		98,216
2003	1,653	32,459	1,009	0	965	913		964	49		32	18,765					401	52,988	1,326				36		111,560
2004	1,158	28,873	955	9	434	818		818	38	0	33		11,165	4,567	185	123	337	53,405	1,866				14		104,798
2005	1,621	22,699	1,481	2	468	834		549	34	0	26		9,548	3,852	78	62	286	58,474	1,417				17		101,447
2006	1,745	20,498	1,132	4	534	1,475		578	39	0	36		11,826	3,582	196	165	425	58,719	1,943				15		102,912
2007	2,519	30,209	1,149	2	522	834		762	33	0	26		17,581	3,946	157	210	433	55,742	2,049				13		116,187
2008	1,278	26,597	894	0	827	2,527		342	18	0	46		16,923	3,265	185	108	388	57,690	2,315				49		113,451
2009	1,779	26,500	1,096	1	2,263	10,743		571	23	0	45		14,724	3,064	197	122	405	72,563	2,496				91		136,683
2010	1,285	25,164	1,076	0	1,866	24,151		577	29	0	40		14,304	4,033	222	143	497	68,496	2,696				105		144,684
2011	1,208	10,597	1,019	1	531	3,288	5,489	279	7	0	55		18,403	2,566	131	231	616	50,600		721	502	4	99	11	96,358
2012	975	12,991	1,199	1	1,657	3,404	7,023	322	12	0	42		18,554	2,388	183	228	734	46,859		1,080	807	2	128	11	98,601
2013/e	2,964	8,720	1,090	0	310	6,472	5,700	210	10	0	38		26,342	1,900	309	293	670	23,034		1,067	601	5	141	39	79,916

a/ Arrowtooth flounder included in Greenland turbot catch statistics, 1964-69.

b/ Includes POP shortraker, rougheye, northern, and sharpchin rockfish until 2004.

c/ Rock sole prior to 1991 and flathead sole prior to 1995 are included in other flatfish catch statistics.

d/ Kamchatka flounder included in Arrowtooth flounder prior to 2011.

e/ Data through November 9, 2013.

f/ Octopus, sculpin, sharks, skates included in Other species prior to 2011.

g/ Catch from Federal fishery only (does not include State harvests that accrue to GHL since 2004

Note: Numbers don't include fish taken for research.

Table 4. Groundfish catches (metric tons) in the Bering Sea and Aleutian Islands, 1954-2013.

Year	Pollock	Pacific Cod	Sable Fish	Yellowfin Sole	Greenland Turbot	Arrowtooth Flounder/a	Kamchatka Flounder/d	Rock Sole/c	Flathead sole	Alaska Plaice	Other Flatfish	Pacific Ocean Perch Complex/b	Pacific Ocean Perch	Northern Rockfish	Blackspotted /Rougheye Rockfish	Shortraker Rockfish	Other Rockfish	Atka Mackerel	Other Species	Skates	Sculpins	Sharks	Squids	Octopus	Total (All Species)
1954	0	0	0	12,562	0	0	0	0		0	0	0	0	0	0	0	0	0	0				0		12,562
1955	0	0	0	14,690	0	0	0	0		0	0	0	0	0	0	0	0	0	0				0		14,690
1956	0	0	0	24,697	0	0	0	0		0	0	0	0	0	0	0	0	0	0				0		24,697
1957	0	0	0	24,145	0	0	0	0		0	0	0	0	0	0	0	0	0	0				0		24,145
1958	6,924	171	6	44,153	0	0	0	0		0	0	0	0	0	0	0	0	0	147				0		51,401
1959	32,793	2,864	289	185,321	0	0	0	0		0	0	0	0	0	0	0	0	0	380				0		221,647
1960	0	0	1,861	456,103	36,843	0	0	0		0	0	6,100	0	0	0	0	0	0	0				0		500,907
1961	0	0	15,627	553,742	57,348	0	0	0		0	0	47,000	0	0	0	0	0	0	0				0		673,717
1962	0	0	25,989	420,703	58,226	0	0	0		0	0	20,100	0	0	0	0	0	0	0				0		525,018
1963	0	0	14,370	85,810	31,572	0	0	0		0	35,643	45,300	0	0	0	0	0	0	0				0		212,695
1964	174,792	13,649	5,086	111,177	34,233	0	0	0		0	30,604	116,200	0	0	0	0	0	0	802				0		486,543
1965	230,551	15,170	6,087	53,810	10,047	0	0	0		0	11,686	125,900	0	0	0	0	0	0	2,986				0		456,237
1966	261,678	18,354	10,846	102,353	13,105	0	0	0		0	24,864	106,100	0	0	0	0	0	0	2,370				0		539,670
1967	550,362	32,357	13,350	162,228	24,263	0	0	0		0	32,109	75,500	0	0	0	0	0	0	12,920				0		903,089
1968	702,181	58,191	6,047	84,189	35,445	0	0	0		0	29,647	76,400	0	0	0	0	0	0	31,006				0		1,023,106
1969	862,789	50,571	17,682	167,134	36,257	0	0	0		0	34,749	53,300	0	0	0	0	0	0	13,547				0		1,236,029
1970	1,256,565	70,377	12,985	133,079	19,976	12,872	0	0		0	64,690	76,800	0	0	0	0	0	949	25,966				0		1,674,259
1971	1,743,763	45,132	18,042	160,399	42,214	19,373	0	0		0	92,452	31,600	0	0	0	0	0	0	16,469				0		2,169,444
1972	1,874,534	43,340	16,289	47,856	77,384	14,446	0	0		0	76,813	38,900	0	0	0	0	0	5,907	33,340				0		2,228,809
1973	1,758,919	54,363	8,859	78,240	63,946	12,922	0	0		0	43,919	15,500	0	0	0	0	0	1,712	60,070				0		2,098,450
1974	1,588,390	63,841	6,735	42,235	78,442	24,668	0	0		0	37,357	36,400	0	0	0	0	0	1,377	69,987				0		1,949,432
1975	1,356,736	54,389	4,513	64,690	67,789	21,616	0	0		0	20,393	25,200	0	0	0	0	0	13,326	63,133				0		1,691,785
1976	1,177,822	54,671	4,582	56,221	62,590	19,176	0	0		0	21,746	28,900	0	0	0	0	0	13,126	33,196				0		1,472,030
1977	985,995	36,597	4,615	58,373	30,161	11,489	0	0		0	14,393	10,734	0	0	0	0	3,354	20,975	52,072				6,734		1,235,492
1978	985,713	45,838	2,013	138,433	42,189	10,140	0	0		0	21,040	7,507	0	0	0	0	3,535	24,249	73,973				8,971		1,363,601
1979	923,385	39,354	2,158	99,017	41,409	14,357	0	0		0	19,724	7,210	0	0	0	0	6,625	23,264	51,701				6,538		1,234,742
1980	1,016,435	51,649	2,480	87,391	52,553	18,364	0	0		0	20,406	5,797	0	0	0	0	879	20,488	47,661				6,372		1,330,475
1981	1,029,021	62,458	3,137	97,301	57,321	17,113	0	0		0	23,428	4,844	0	0	0	0	684	19,688	42,925				5,945		1,363,865
1982	1,013,942	56,566	4,139	95,712	52,122	11,518	0	0		0	23,809	1,238	0	0	0	0	2,390	19,874	23,367				5,039		1,309,716
1983	1,041,389	93,167	3,368	108,385	47,558	13,969	0	0		0	30,454	501	0	0	0	0	1,265	11,726	19,140				3,980		1,374,902
1984	1,180,617	133,160	3,328	159,526	23,120	9,452	0	0		0	44,286	2,200	0	0	0	0	232	36,055	10,178				3,167		1,605,321
1985	1,238,489	145,426	3,796	227,107	14,731	7,375	0	0		0	71,179	1,092	0	0	0	0	191	37,860	13,553				1,620		1,762,419
1986	1,235,090	140,887	6,546	208,597	9,864	6,903	0	0		0	76,328	846	0	0	0	0	271	31,990	11,980				868		1,730,170
1987	1,266,317	157,746	8,012	181,429	9,599	4,539	0	0		0	50,372	1,934	0	0	0	0	621	30,061	9,724				131		1,720,485
1988	1,271,000	197,891	6,608	223,156	7,108	5,883	0	0		0	137,418	3,026	0	0	0	0	619	22,084	12,643				417		1,887,853
1989	1,386,000	168,918	4,500	153,165	8,822	3,222	0	0		0	63,452	4,723	0	0	0	0	673	17,994	5,101				306		1,816,876
1990	1,426,000	171,008	4,445	80,584	9,620	4,232	0	0		0	22,568	20,289	0	0	0	0	1,248	22,205	6,325				471		1,768,995
1991	1,346,464	172,158	3,199	96,135	6,878	13,686	0	46,681		0	30,489	7,289	0	0	0	0	945	24,523	16,376				574		1,765,397
1992	1,438,412	206,129	2,104	146,946	2,770	11,980	0	51,956		0	34,825	13,586	0	0	0	0	4,364	49,441	33,074				880		1,996,467
1993	1,358,758	167,390	2,747	105,809	8,468	9,298	0	64,260		0	28,871	17,138	0	0	0	0	685	66,006	23,953				682		1,854,065
1994	1,421,402	196,572	2,470	144,544	10,379	14,377	0	60,584		0	29,775	18,866	0	0	0	0	562	69,591	24,532				588		1,994,242
1995	1,329,503	245,030	2,048	124,752	8,193	9,283	0	55,028	14,715	0	20,196	15,944	0	0	0	0	849	81,554	22,201				459		1,929,755
1996	1,218,229	240,590	1,349	130,163	6,376	14,610	0	47,146	17,344	0	18,580	23,078	0	0	0	0	642	103,867	21,437				1,167		1,844,578
1997	1,142,140	234,641	1,326	166,915	7,666	9,651	0	67,520	20,688	0	22,964	16,747	0	0	0	0	468	65,839	22,552				1,761		1,780,878
1998	1,125,249	195,645	1,181	101,315	9,124	15,679	0	33,667	24,569	0	15,390	14,863	0	0	0	0	588	57,096	25,604				916		1,620,886
1999	989,684	174,855	1,349	69,288	5,861	11,359	0	41,085	18,568	0	15,535	19,155	0	0	0	0	798	56,233	20,586				401		1,424,757
2000	1,133,980	191,056	1,812	84,070	6,974	13,228	0	49,666	20,422	0	16,485	15,597	0	0	0	0	840	47,229	26,108				383		1,607,850
2001	1,388,276	176,659	1,937	63,578	5,312	14,056	0	29,475	17,811	0	9,973	16,735	0	0	0	0	906	61,560	27,177				1,766		1,815,221
2002	1,482,992	197,353	2,261	74,985	3,635	11,853	0	41,865	15,575	0	2,627	15,854	0	0	0	0	952	45,294	28,619				1,344		1,925,209
2003	1,493,692	207,146	2,048	81,050	3,530	14,580	0	37,339	14,181	10,118	2,954	20,156	0	0	0	0	737	59,350	28,312				1,282		1,976,475
2004	1,481,701	212,156	1,993	75,510	2,259	18,151	0	48,680	17,392	7,888	4,788		11,896	4,684	209	242	655	60,564	29,362				1,014		1,979,142
2005	1,484,907	205,637	2,545	94,384	2,608	14,242	0	37,363	16,108	11,194	4,592		10,426	3,964	90	170	464	62,014	29,483				1,187		1,981,377
2006	1,488,393	188,763	2,168	99,138	1,986	13,386	0	36,456	17,973	17,318	3,160		12,868	3,829	203	213	582	61,894	26,808				1,418		1,976,556
2007	1,357,011	170,288	2,322	120,968	2,003	11,914	0	37,126	19,119	19,522	5,790		18,451	4,015	167	323	652	58,763	26,828				1,188		1,856,450
2008	991,854	166,201	2,018	148,894	2,751	21,884	0	51,277	24,538	17,377	3,624		17,436	3,287	214	166	597	58,088	29,378				1,542		1,541,127
2009	812,522	173,666	1,987	107,513	4,512	30,419	0	48,716	19,558	13,944	2,176		15,347	3,112	209	205	609	72,807	27,854				360		1,335,516
2010	811,680	168,023	1,830	118,624	4,138	39,416	0	53,222	20,126	16,165	2,194		17,851	4,332	256	324	760	68,647	23,366				410		1,351,364
2011	1,200,451	219,861	1,714	151,167	3,642	20,612	9,934	60,632	13,556	23,656	3,176		24,003	2,764	170	334	940	51,810	0	23,135	5,362	105	336	587	1,817,947
2012	1,206,313	245,823	1,938	147,187	4,720	22,714	9,668	76,098	11,381	16,612	3,524	0	24,144	2,479	201	348	945	47,831	0	24,819	5,796	95	688	138	1,853,462
2013/e	1,270,983	221,396	1,730	156,302	1,747	20,159	7,794	59,040	16,712	23,312	1,512	0	28,049	1,993	341	420	851	23,180	0	24,928	5,548	86	298	195	1,866,577

a/ Arrowtooth flounder included in Greenland turbot catch statistics, 1960-69.

b/ Includes POP shortraker, rougheye, northern, and sharpchin.

c/ Rock sole prior to 1991 and flathead sole prior to 1995 are included in other flatfish catch statistics.

d/ Kamchatka flounder included in Arrowtooth flounder prior to 2011.

e/ Data through November 9, 2013.

f/ Octopus, sculpin, sharks, skates included in Other species prior to 2011.

Note: Numbers don't include fish taken for research.

Table 5. Summary of stock abundance (biomass), overfishing level (OFL), acceptable biological catch (ABC), the fishing mortality rate corresponding to ABC (F_{ABC}), and the fishing mortality rate corresponding to OFL (F_{OFL}) for the eastern Bering Sea (EBS), Aleutian Islands (AI), and Bogoslof district as projected for 2014 and 2015. "Biomass" corresponds to projected January abundance for the age+ range reported in the summary. Stock-specific biomass, OFL, and ABC are in metric tons.

			2014					2015			
Species or Complex	**Tier**	**Area**	**Biomass**	**OFL**	**ABC**	**F_{OFL}**	**F_{ABC}**	**OFL**	**ABC**	**F_{OFL}**	**F_{ABC}**
Pollock	1a	EBS	8,045,000	2,795,000	1,369,000	0.518	0.250	2,693,000	1,258,000	0.518	0.220
	3b	Aleutian Islands	259,525	42,811	35,048	0.330	0.260	47,713	39,412	0.330	0.280
	5	Bogoslof District	67,063	13,413	10,059	0.200	0.150	13,413	10,059	0.200	0.150
Pacific cod	3a	BS	1,570,000	299,000	255,000	0.340	0.280	319,000	272,000	0.340	0.280
	5	AI	59,000	20,100	15,100	0.340	0.260	20,100	15,100	0.340	0.260
Sablefish	3b	BS	21,000	1,584	1,339	0.095	0.080	1,432	1,210	0.090	0.077
	3b	AI	28,000	2,141	1,811	0.095	0.080	1,936	1,636	0.090	0.077
Yellowfin sole	1a	BSAI	2,113,000	259,700	239,800	0.112	0.105	268,900	248,300	0.112	0.105
Greenland turbot	3b	Total	84,546	2,647	2,124	0.140	0.120	3,864	3,173	0.180	0.150
Arrowtooth flounder	3a	BSAI	1,023,440	125,642	106,599	0.186	0.156	125,025	106,089	0.186	0.156
Kamchatka flounder	3	BSAI	136,600	8,270	7,100	0.073	0.063	8,500	7,300	0.073	0.063
Northern rock sole	1a	BSAI	1,393,200	228,700	203,800	0.164	0.146	213,310	190,100	0.164	0.146
Flathead sole	3a	BSAI	745,237	79,633	66,293	0.348	0.285	77,023	64,127	0.348	0.285
Alaska plaice	3a	BSAI	576,300	66,800	55,100	0.190	0.158	66,300	54,700	0.190	0.158
Other flatfish	5	BSAI	107,500	16,700	12,400	.17/.085/.15	.13/.064/.113	16,700	12,400	.17/.085/.15	.13/.064/.113
Pacific ocean perch	3a	BSAI	639,505	39,585	33,122	0.076	0.063	37,817	31,641	0.076	0.063
Northern rockfish	3a	BSAI	196,519	12,077	9,761	0.079	0.063	11,943	9,652	0.079	0.063
Shortraker rockfish	5	BSAI	16,447	493	370	0.030	0.0225	493	370	0.030	0.0225
Blackspotted/Rougheye	3b/5	BSAI	30,447	505	416	0.029	0.024	580	478	0.031	0.026
Other rockfish	5	BSAI	47,700	1,550	1,160	.03/.09	.023/.068	1,550	1,160	.03/.09	.023/.068
Atka mackerel	3a	Total	384,364	74,492	64,131	0.514	0.421	74,898	64,477	0.514	0.421
Skate	3a/5	BSAI	698,204	41,849	35,383	0.113/0.1	0.098/0.075	39,746	33,545	0.113/0.1	0.098/0.075
Sculpin	5	BSAI	215,713	56,424	42,318	0.280	0.210	56,424	42,318	0.280	0.210
Shark	6	BSAI	n/a	1,363	1,022	n/a	n/a	1,363	1,022	n/a	n/a
Squid	6	BSAI	n/a	2,624	1,970	n/a	n/a	2,624	1,970	n/a	n/a
Octopus	6	BSAI	n/a	3,450	2,590	n/a	n/a	3,450	2,590	n/a	n/a
Total		**BSAI**	**18,458,310**	**4,196,553**	**2,572,816**			**4,107,104**	**2,472,829**		

Table 6. Species included in assessments for the 2013 BSAI SAFE Report.

Chapter	Common name	Scientific name	Count
1	**Walleye Pollock**	Gadus chalcogrammus	1
2	**Pacific cod**	Gadus macrocephalus	1
3	**Sablefish**	Anoplopoma fimbria	1
4	**Yellowfin sole**	Limanda aspera	1
5	**Greenland turbot**	Reinhardtius hippoglossoides	1
6	**Arrowtooth flounder**	Atherestes stomias	2
7	**Kamchatka flounder**	Atherestes evermanni	
8	**Northern rock sole**	Lepidopsetta polyxystra n. sp.	2
	Southern rock sole	Lepidopsetta bilineata	
9	**Flathead sole**	Hippoglossoides classodon	2
	Bering flounder	Hippoglossoides robustus	
10	**Alaska plaice**	Pleuronectes quadrituberculatus	1
11	**Other flatfish**		15
	Arctic flounder	Liopsetta glacialis	
	butter sole	Isopsetta isolepis	
	curlfin sole	Pleuronectes decurrens	
	deepsea sole	Embassichths bathybius	
	Dover sole	Microstomus pacificus	
	English sole	Parophrys vetulus	
	longhead dab	Limanda proboscidea	
	Pacific sanddab	Citharichthys sordidus	
	petrale sole	Eopsetta jordani	
	rex sole	Glyptocephalus zachirus	
	roughscale sole	Clidodoerma asperrimum	
	sand sole	Psettichthys melanostictus	
	slender sole	Lyopsetta exilis	
	starry flounder	Platichthys stellatus	
	Sakhalin sole	Pleuronectes sakhalinensis	
12	**Pacific Ocean perch**	Sebastes alutus	1
13	**Northern rockfish**	Sebastes polyspinus	1
14	**Blackspotted/Rougheye**		2
	Blackspotted rockfish	Sebastes melanostictus	
	Rougheye rockfish	Sebastes aleutianus	
15	**Shortraker rockfish**	Sebastes borealis	1
16	**Other rockfish***		
	Shortspine thornyhead	Sebastolobus alascanus	7
	Dusky rockfish	Sebastes variabilis	
	Red banded rockfish	Sebastes babcocki	
	Redstripe rockfish	Sebastes proriger	
	Harlequin rockfish	Sebastes variegatus	
	Sharpchin rockfish	Sebastes zacentrus	
	Yelloweye rockfish	Sebastes ruberrimus	
17	**Atka mackerel**	Pleurogrammus monopterygius	1

Chapter	Common name	Scientific name	Count	(continued)
18	**Skates**		15	
	deepsea skate	Bathyraja abyssicola		
	Aleutian skate	Bathyraja aleutica		
	Bering skate (complex?)	Bathyraja interrupta		
	Commander skate	Bathyraja lindbergi		
	whiteblotched skate	Bathyraja maculata		
	butterfly skate	Bathyraja mariposa		
	whitebrow skate	Bathyraja minispinosa		
	Alaska skate	Bathyraja parmifera		
	"Leopard" parmifera	Bathyraja sp. cf. parmifera		
	mud skate	Bathyraja taranetzi		
	roughtail skate	Bathyraja trachura		
	Okhotsk skate	Bathyraja violacea		
	big skate	Raja binoculata		
	roughshoulder skate	Amblyraja badia		
	longnose skate	Raja rhina		
19	**Sculpins**		48	
	Scaled sculpin	Archistes biseriatus		
	Bride sculpin	Artediellus miacanthus		
	Pacific hookear sculpin	Artediellus pacificus		
	Broadfin sculpin	Bolinia euryptera		
	Antlered sculpin	Enophrys diceraus		
	Leister sculpin	Enophrys lucasi		
	Purplegray sculpin	Gymnocanthus detrisus		
	Armorhead sculpin	Gymnocanthus galeatus		
	threaded sculpin	Gymnocanthus pistilliger		
	Arctic staghorn sculpin	Gymnocanthus tricuspis		
	Banded Irish lord	Hemilepidotus gilberti		
	Red Irish Lord	Hemilepidotus hemilepidotus		
	Yellow Irish Lord	Hemilepidotus jordani		
	Butterfly sculpin	Hemilepidotus papilio		
	Longfin Irish lord	Hemilepidotus zapus		
	Northern sculpin	Icelinus borealis		
	Blacknose sculpin	Icelus canaliculatus		
	Wide-eye sculpin	Icelus euryops		
	Spatulate sculpin	Icelus spatula		
	thorny sculpin	Icelus spiniger		
	Uncinate sculpin	Icelus uncinalis		
	Longfin sculpin	Jordania zonope		
	Pacific staghorn sculpin	Leptocottus armatus		
	Plain sculpin	Myoxocephalus jaok		
	Great sculpin	Myoxocephalus polyacanthocephalus		
	Fourhorn sculpin	Myoxocephalus quadricornis		
	Warty sculpin	Myoxocephalus verrucocus		
	Slim sculpin	Radulinus asprellus		
	Roughskin sculpin	Rastrinus scutiger		
	Sponge sculpin	thyriscus anoplus		
	Scissortail sculpin	Triglops forficatus		
	Roughspine sculpin	Triglops macellus		
	Crescent-tail sculpin	Triglops metopias		

Chapter	Common name	Scientific name	Count	(continued)
	Ribbed sculpin	Triglops pingelii		
	Spectacled sculpin	Triglops septicus		
	Scalybreasted sculpin	Triglops xenostethus		
	Flabby sculpin	Zesticelus profundorum		
	Crested sculpin	Blepsias bilobus		
	Bigmouth sculpin	Hemitripterus bolini		
	Sailfin sculpin	Nautichthys oculofasciatus		
	Eyeshade sculpin	Nautichthys pribilovius		
	Spinyhead sculpin	Dasycottus setiger		
	Smoothcheek sculpin	Eurymen gyrinus		
	Darkfin sculpin	Malacoccottus zonurus		
	Blackfin sculpin	Malacocottus kincaidi		
	Tadpole sculpin	Psychrolutes paradoxus		
	Blob sculpin	Psychrolutes phrictus		
	Grunt sculpin	Rhamphocottus richardsoni		
20	**Sharks**		8	
	brown cat shark	Apristurus brunneus		
	White shark	Carcharodon carcharias		
	basking shark	Cetorhinus maximus		
	sixgill shark	Hexanchus griseus		
	salmon shark	Lamna ditropis		
	blue shark	Prionace glauca		
	Pacific sleeper shark	Somniosus pacificus		
	Spiny dogfish	Squalus acanthias		
21	**Squids**		14	
		Chiroteuthis calyx		
	"glass squids"	Belonella borealis		
		Galiteuthis phyllura		
	minimal armhook squid	Berryteuthis anonychus		
	magistrate armhook squid	Berryteuthis magister		
		Eogonatus tinro		
	boreopacific armhook squid	Gonatopsis borealis		
	Berry armhook squid	Gonatus berryi		
		Gonatus madokai		
		Gonatus middendorffi		
	clawed armhook squid	Gonatus onyx		
	robust clubhook squid	Moroteuthis robusta		
	boreal clubhook squid	Onychoteuthis borealijaponicus		
	North Pacific bobtail squid	Rossia pacifica		
22	**Octopus**		8	
	flapjack devilfish	Opisthoteuthis cf californiana		
	pelagic octopus	Japetella diaphana		
	smooth octopus	Benthoctopus leioderma		
		Benthoctopus oregonensis		
		Benthoctopus salebrosus		
	giant octopus	Enteroctopus dofleini		
		Granelodone boreopacifica		
	stubby octopus	Sasakiopus salebrosus		
Total Species			**133**	