

INITIAL REVIEW DRAFT

Environmental Assessment/ Regulatory Impact Review/
Initial Regulatory Flexibility Analysis
for Proposed Amendment
to the Fishery Management Plan for Groundfish of the
Bering Sea/Aleutian Islands Management Area

Revise Bering Sea/Aleutian Islands Halibut Prohibited Species Catch Limits

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Abstract: This document analyzes proposed management measures to reduce Pacific halibut prohibited species catch (PSC) mortality limits in the Bering Sea/Aleutian Islands (BSAI) groundfish fisheries. PSC limit reductions are considered for various sectors, including the BSAI trawl limited access sector, the Amendment 80 sector, longline catcher vessels, longline catcher processors, and the Community Development Quota sector (i.e., a reduction to the CDQ's allocated prohibited species quota reserve). The objective of reducing PSC limits would be to minimize bycatch to the extent practicable, potentially provide additional harvest opportunities in the directed halibut fishery, and help improve halibut stock conditions. The North Pacific Fishery Management Council (Council) has also asked for additional information on other issues, which are not currently part of the action, except that they may inform the Council with respect to other options that could be considered for inclusion.

List of Acronyms and Abbreviations

| | |
|------------|--|
| A80 | Amendment 80 |
| ABC | acceptable biological catch |
| ADFG | Alaska Department of Fish and Game |
| AFA | American Fisheries Act |
| AFSC | Alaska Fisheries Science Center |
| AKFIN | Alaska Fisheries Information Network |
| AKSC | Alaska Seafood Cooperative |
| BBEDC | Bristol Bay Economic Development Corporation |
| BPD | Bycatch Projection Delta |
| BSAI | Bering Sea and Aleutian Islands |
| BSAI TLA | Bering Sea and Aleutian Islands Trawl Limited Access sector |
| CAS | Catch Accounting System |
| CEQ | Council on Environmental Quality |
| CFEC | State of Alaska Commercial Fisheries Entry Commission |
| CFR | Code of Federal Regulations |
| COAR | Commercial Operator's Annual Report |
| Convention | Convention between the U.S. and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea |
| Council | North Pacific Fishery Management Council |
| CP | catcher processor |
| CSP | Catch Sharing Plan |
| CV | catcher vessel |
| CVRF | Coastal Village Region Fund |
| DMR | Discard mortality rate |
| DPS | distinct population segment |
| E | East |
| E.O. | Executive Order |
| EA | Environmental Assessment |
| EEZ | Exclusive Economic Zone |
| EFH | essential fish habitat |
| EFP | Exempted Fishing Permit |
| EIS | Environmental Impact Statement |
| ESA | Endangered Species Act |
| FCEY | fishery constant exploitation yield |
| FLCC | Freezer Longline Conservation Cooperative |
| FMP | fishery management plan |
| FR | <i>Federal Register</i> |
| FRFA | Final Regulatory Flexibility Analysis |
| ft | foot or feet |
| GHL | guideline harvest level |
| GOA | Gulf of Alaska |
| HMT | Halibut PSC mortality |
| IFQ | |
| IMS Model | Iterative Multi-year Simulation Model; model that is the basis of this analysis |
| IRFA | Initial Regulatory Flexibility Analysis |
| IPHC | International Pacific Halibut Commission |
| lb | pound(s) |
| LLP | license limitation program |

| | |
|----------------------|--|
| m | meter or meters |
| M | million |
| Magnuson-Stevens Act | Magnuson-Stevens Fishery Conservation and Management Act |
| MMPA | Marine Mammal Protection Act |
| MSST | minimum stock size threshold |
| mt / MT | metric ton |
| NEI | Northern Economics, Inc. |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fishery Service |
| NOAA | National Oceanographic and Atmospheric Administration |
| NPFMC | North Pacific Fishery Management Council |
| NPV | Net present value |
| NSEDC | Norton Sound Economic Development Corporation |
| O26 | Halibut that are over 26 inches in length |
| O32 | Halibut that are over 32 inches in length |
| Observer Program | North Pacific Groundfish and Halibut Observer Program |
| OMB | Office of Management and Budget |
| OT AK | Other Alaska |
| PBR | potential biological removal |
| PSC | prohibited species catch |
| PSQ | Prohibited species quota |
| PRA | Paperwork Reduction Act |
| PSEIS | Programmatic Supplemental Environmental Impact Statement |
| QS | Quota share |
| RFA | Regulatory Flexibility Act |
| RFFA | reasonably foreseeable future action |
| RIR | Regulatory Impact Review |
| SAFE | Stock Assessment and Fishery Evaluation |
| SAR | stock assessment report |
| SBA | Small Business Act |
| Secretary | Secretary of Commerce |
| SHARC | Subsistence Halibut Registration Certificate |
| SPLASH | Structure of Populations, Levels of Abundance, and Status of Humpbacks |
| SPR | Spawning Potential Ratio |
| SW | southwest |
| SWHS | ADFG Statewide Harvest Survey |
| TAC | total allowable catch |
| TCEY | total constant exploitation yield |
| U26 | Halibut that are under 26 inches in length |
| U32 | Halibut that are under 32 inches in length |
| U.S. | United States |
| USFWS | United States Fish and Wildlife Service |
| W | West |

Executive Summary

This document analyzes proposed management measures to reduce Pacific halibut prohibited species catch (PSC) mortality limits in the Bering Sea/Aleutian Islands (BSAI) groundfish fisheries. PSC limit reductions are considered for various sectors, including the BSAI trawl limited access sector, the Amendment 80 sector, longline catcher vessels, longline catcher processors, and the Community Development Quota (CDQ) sector (i.e., a reduction to the CDQ's allocated prohibited species quota reserve). The objective of reducing PSC limits would be to minimize bycatch to the extent practicable, potentially provide additional harvest opportunities in the directed halibut fishery, and help improve halibut stock conditions. The North Pacific Fishery Management Council (Council) has also asked for additional information on other issues, which are not currently part of the action, except that they may inform the Council with respect to other options that could be considered for inclusion.

Bycatch and PSC terminology

The Council manages the groundfish fisheries of the BSAI under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1802(2)), and through a Fishery Management Plan for the BSAI Management Area (BSAI FMP). Bycatch, as defined by the MSA, “means fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards¹ and regulatory discards.” The term “regulatory discards” means “fish harvested in a fishery which fishermen are required by regulation to discard whenever caught, or are required by regulation to retain, but not sell.” In the case of the BSAI FMP, the Council has designated Pacific halibut, along with several other fully utilized species such as salmon, herring, and crab species, as “prohibited species” in the groundfish fisheries, which fishermen are required by regulation to discard. These species are identified in law; their capture is required to be minimized; and their retention is prohibited. Unintended removals of prohibited species are separately monitored and controlled under the groundfish fishery management plans. In the context of the BSAI FMP, “halibut PSC” refers to the bycatch of halibut in the groundfish fisheries. This analysis primarily addresses halibut PSC mortality, i.e., the subset of halibut PSC that is assumed to be dead as a consequence of interactions with the groundfish fisheries. Mortality calculations are made for all halibut PSC in the groundfish fisheries, using discard mortality rates adopted triennially by the Council as part of the harvest specifications process. Halibut PSC limits, and removals of halibut PSC in the groundfish fisheries, are specified in terms of metric tons, round weight, of halibut PSC mortality.

The International Pacific Halibut Commission (IPHC) is responsible for the overall biologic assessment and conservation of Pacific halibut off the coasts of Alaska, British Columbia, and the western United States. In the parlance of the IPHC, “bycatch” refers to the mortality of Pacific halibut occurring in commercial fisheries that target other species, including halibut PSC mortality in the groundfish fisheries. This analysis refers to halibut PSC mortality in the context of the proposed action, except where appropriate to describe the IPHC catch limit process, or their research or stock assessment information. The IPHC manages and reports on halibut removals in pounds, net weight, of halibut mortality, and assumes that net weights are 75 percent of round weights.

Purpose and Need

Consistent with the MSA's National Standard 1 and National Standard 9, the Council and NMFS use halibut PSC mortality limits to minimize halibut bycatch in the groundfish fisheries to the extent practicable, while achieving, on a continuing basis, the optimum yield from the groundfish fisheries. The

¹ “Economic discards” are defined as “fish which are the target of a fishery, but which are not retained because of an undesirable size, sex, or quality, or other economic reason.”

Council has designated Pacific halibut as “prohibited species” in groundfish fisheries, which fishermen are required by regulation to discard.

The IPHC accounts for incidental halibut removals in the groundfish fisheries, recreational and subsistence catches, and other sources of halibut mortality before setting commercial halibut catch limits each year. Declines in the exploitable biomass of halibut since the late 1990s, and decreases in the Pacific halibut catch limits set by the IPHC for the directed BSAI halibut fisheries, have raised concerns about the levels of halibut PSC mortality by the commercial groundfish trawl and hook-and-line sectors. Reductions in halibut PSC mortality have not been proportional to the reductions in directed halibut harvest limits over this time period, although Council recognizes industry efforts to reduce halibut PSC mortality. Under National Standard 8, the Council must also provide for the sustained participation of and minimize adverse economic impacts on fishing communities, and BSAI coastal communities are affected by reduced catch limits for the directed halibut fishery, especially in IPHC Area 4CDE.

The proposed action would reduce the halibut PSC limits in the BSAI, which are established for the BSAI trawl and fixed gear sectors in Federal regulation, and in some cases, in the BSAI Groundfish FMP. Minimizing halibut PSC mortality while achieving optimum yield is necessary to maintain a healthy marine ecosystem, ensure long-term conservation and abundance of halibut, provide maximum benefit to fishermen and communities that depend on halibut and groundfish resources, as well as U.S. consumers, and comply with the Magnuson-Stevens Act and other applicable Federal law. Halibut “savings” that would occur from reducing halibut PSC mortality below current usage, would accrue to the directed halibut fisheries in both the near term and long term.

Alternatives

The Council adopted the alternatives listed below for analysis in June 2014. More than one alternative or option listed below may be selected simultaneously. **Staff have proposed some minor modifications to Alternative 2 options, which are consistent with Council intent.** The proposed modifications are indicated in underline or ~~strikeout~~, and all of the alternatives and options, including the proposed modifications, are explained in more detail in the subsections that follow.

With respect to Alternative 3, the Council received a report on progress with developing deck sorting procedures and technologies that could reduce halibut mortalities in October 2014. In compliance with the Council’s request, industry and NMFS are working together to develop deck sorting procedures, and have determined that these need to be further tested through an Experimental Fishing Permit. As a result, the Council acknowledged that there is not yet sufficient information to analyze halibut mortality reductions as a result of this alternative in time for initial review in February 2015. **Staff recommends that this alternative be removed from the analysis at this time.**

Alternative 1 No action.

Alternative 2 Amend the BSAI Groundfish FMP to revise halibut PSC limits as follows (*more than one option can be selected*).

~~**Option 1** Establish seasonal apportionment of halibut PSC in the BSAI trawl limited access sector.~~

Option 2 Reduce halibut PSC limit for the BSAI Trawl Limited Access Sector by:
a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

Option 3 Reduce halibut PSC limit for the Amendment 80 Sector by:
a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

Option 4 Reduce halibut PSC limit for Pacific cod hook and line catcher vessel sector by:

a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

Option 5 Reduce halibut PSC limit for Pacific cod hook and line catcher processor sector by:

a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

Option 6 Reduce the CDQ halibut PSQ limit by:

a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

Option 7 Reduce halibut PSC limit for other non-trawl (i.e., hook and line catcher vessels and catcher processors targeting anything except Pacific cod or sablefish) by:

a) 10 percent b) 20 percent c) 30 percent or d) 35 percent

~~**Alternative 3.** Implement measures in the Amendment 80 sector to provide opportunities for deck sorting of halibut, or other handling practices that may provide an opportunity to reduce mortality of halibut that cannot be avoided.~~

The Council also requested several additional items to be included in the analytical package for addressing BSAI halibut PSC mortality. Staff has also added two additional items to this list of discussion items, to correspond with proposed modifications to the alternatives. Also, the Council's June 2014 motion included three items to be addressed on a related timeline to the halibut analysis. These are included at the bottom of the list, and an update is included in the analysis.

- Maps/tables of catch/bycatch in IPHC closed area: The levels of groundfish catch and halibut PSC by groundfish sectors, and the size and age distribution of that halibut PSC, in the existing IPHC area (Closed Area) that is closed to the directed halibut fishery in the Bering Sea.
- PSC limit for IFQ sablefish: Whether a halibut PSC limit would be appropriate to limit halibut PSC mortality in the directed sablefish IFQ fishery.
- Effects on salmon bycatch: Potential impacts of efforts to reduce halibut PSC mortality on existing and anticipated Chinook and chum salmon PSC management measures (i.e., incentive plan agreements).
- Biomass-based PSC limits: The range of potential approaches to establishing a halibut PSC limit based on projections of total biomass, projected spawning biomass, or other appropriate indices of abundance and productivity.
- Halibut PSC rollovers: Current protocols for rolling unused halibut between sectors, and the effect of those protocols on the achievement of OY and/or reductions in overall halibut PSC mortality
- 4CDE subsistence info: Overview of available subsistence information for Areas 4CDE
- Directed halibut fishery: Fishing practices that reduce halibut bycatch in the directed halibut fishery
- Amendment 80 measures: Evaluate the potential for the Amendment 80 flatfish flexibility program to reduce halibut PSC mortality; evaluate the potential of a change to the Amendment 80 trawl season opening date from Jan 20 to Jan 1 to reduce halibut PSC mortality; evaluate the potential of changes to the current Amendment 80 area closures to reduce halibut PSC mortality
- Seasonal apportionment: Evaluate whether seasonal apportionment in the BSAI trawl limited access fishery could reduce halibut PSC mortality
- Halibut deck sorting: Provide a progress report on the design and implementation of the deck sorting EFP, and how it relates to the overall reduction of halibut PSC mortality for Amendment 80

- Request for voluntary 10% halibut PSC mortality and discard reduction efforts by the groundfish and halibut industry in 2014 and 2015
- Report on voluntary efforts by industry sectors (American Fisheries Act (AFA) CPs, AFA CVs, Amendment 80, Freezer Longline Conservation Cooperative, CDQ) at time of initial review
- Work with IPHC to incorporate bycatch (halibut PSC mortality) and discard data from observer program into halibut stock assessments

Environmental Assessment

Under Alternative 1, there would be no changes to the regulated BSAI PSC limits. Since 2008, halibut PSC mortality in the BSAI groundfish fisheries has been 70 to 84 percent of the regulated PSC limits. In June 2014, industry sectors were asked by the Council to voluntarily reduce halibut PSC mortality over the 2014 and 2015 fishing seasons, and have been reporting to the Council on measures they are undertaking to reduce halibut PSC mortality.

Alternative 2 could reduce the amount of halibut PSC mortality in the trawl and longline groundfish fisheries. The alternative includes several options to apply PSC limit reductions to different sectors of the BSAI trawl and longline groundfish fleet. Some of the options under Alternative 2 would result in no change to the status quo, while others would result in constraining PSC limits under which industry may change fishing patterns in order to optimize their groundfish harvest with a minimum of halibut PSC mortality, in order to avoid fishery closures². This could result in a response of reducing fishing effort, as the industry chooses not to pursue less valuable fisheries in order to conserve halibut PSC mortality, or it could result in greater fishing effort at lower catch per unit effort, as vessels change fisheries patterns or seasonal changes in the timing of the fishing, to increase halibut avoidance. Shifts in the location or timing of fishing may occur as a result of Alternative 2. However, there is already considerable interannual variability in the patterns of fishing across the BSAI groundfish sectors, as environmental conditions and avoidance of PSC species have caused vessels to adjust their fishing patterns. Any shift in fishing is likely to occur within the existing footprint of the groundfish fishery in the BSAI.

Pacific halibut

Alternative 1 would result in no change to the amount of halibut PSC mortality in the trawl and longline groundfish fisheries, and it is unlikely that groundfish fishing under the status quo, or Alternative 1, has direct or indirect impacts on Pacific halibut sustainability. While the halibut biomass has declined from peaks in the late 1990s, the estimated female spawning biomass appears to have stabilized or be slightly increasing. Halibut mortality in the groundfish fisheries is taken into account when the commercial halibut quotas are set, to prevent significantly adverse impacts on the halibut stocks.

Halibut PSC removals in the groundfish fisheries are constrained by PSC limits, which provide an upper limit annually on halibut PSC mortality. The level of halibut removals in the trawl and longline groundfish fisheries under the status quo could result in reduced allocations to the directed halibut fisheries in Area 4 through reduced yield, as halibut removals are deducted from the total constant exploitation yield (TCEY) for the halibut stock before a directed fishery allocation is calculated. Any reductions in the directed fishery allocations affect the economic state of commercial halibut fishermen or the communities they impact. At the same time, hook-and-line and trawl industry efforts to reduce halibut PSC mortality in the prosecution of the groundfish fisheries may lower the amount of future removals the IPHC deducts from the TCEY. It is unlikely that halibut harvests in unguided sport and subsistence fisheries are impacted by Alternative 1 because these fisheries do not have caps on removals in Area 4, and harvests in the halibut subsistence and unguided sport fisheries are also deducted from the TCEY

² Note that the BSAI pollock fishery is not constrained by the current cap, nor are there options in the analysis to introduce such constraints. As a result, reduced PSC limits would not affect them directly.

prior to the commercial fishery limits being set. Since subsistence and recreational removals are not restricted by catch limits, it is assumed that those sectors are not affected by the status quo or options that reduce the PSC limits.

Alternative 2 includes several options to apply PSC limit reductions to different sectors of the BSAI trawl and longline groundfish fleet, although not all of them result in a change to the status quo, given that the sectors regularly harvest less than the regulated PSC limit. An important component of PSC mortality is the proportion that is over and under 26 inches. Halibut that are over 26 inches (O26) that are killed as PSC would have been a part of the halibut fishery commercial catch limit (FCEY) had they not been killed. Halibut killed as PSC mortality that are under 26 inches (U26), will become a factor for the commercial fishery in later years. Reductions in O26 halibut mortality resulting from PSC will be directly reallocated to increased halibut yields available to harvesters in the directed halibut IFQ fisheries in Area 4, at an approximately 1:1 relationship between halibut PSC mortality “savings” and directed fishery yield. The O26 component is estimated to be 64 percent of the overall BSAI halibut PSC mortality in 2013 (the last full year of data). Because they roll completely into the directed halibut fishery, reductions in O26 halibut PSC mortality will have no effect on the halibut stock condition.

Reductions in halibut PSC mortality of U26 fish will also contribute to increased halibut yields for directed halibut IFQ fisheries, at the same pound for pound relationship, but these yields are in increases to the exploitable biomass, and will be distributed across all regulatory areas, as the fish grow to commercial size. Based on the setline survey, Area 4 represents 22 percent of the exploitable biomass (halibut over 32 inches) for the coastwide halibut stock, therefore approximately 22 percent of the U26 halibut PSC mortality reductions would, at some future time, accrue back to the Area 4 directed fisheries as halibut yield. The remainder of the U26 halibut “savings” would accrue to directed halibut users in other IPHC regions, in proportion to their share of the coastwide biomass. With respect to whether removals of U26 halibut have an effect on the condition of the halibut stock, mortality of juvenile halibut will have an effect on the distribution of the surviving fish, and therefore the subsequent spawning biomass. It is not currently known how important the spatial distribution of the spawning stock may be to short or long-term stock productivity, but greater mortality at younger ages is likely to change this distribution more than older removals. Reductions in U26 halibut PSC mortality could make more halibut of various sizes available in the BSAI. The extent to which this may affect the halibut spawning biomass coastwide depends on the importance of spatial distribution of the spawning stock, but any effect of the PSC limit reductions in the BSAI will be tempered by the proportion of the reduction that affects U26 halibut (currently 34 percent of halibut PSC mortality), and the BSAI’s overall proportion of total coastwide biomass (currently 22 percent). It is notable that while the majority of coastwide U26 halibut PSC mortality occurs in Area 4CDE, the proportion of the coastwide biomass in this area has been stable with a slight increase over the last fifteen years.

For the most part, the options in Alternative 2 which would result in a change from status quo, in terms of halibut PSC mortality, are unlikely to have a different effect on halibut, as catch will largely be reallocated from halibut PSC mortality to directed fishery catch, although there may be some conservation benefit to the stock with respect to reducing the mortality of U26 halibut. Alternative 2 is not anticipated to have a significant effect on the Pacific halibut biomass.

Other resource components

Under the status quo, the BSAI groundfish stocks are neither overfished nor subject to overfishing, and levels of fishing on ecosystem component species (including forage fish and prohibited species) are constrained by bycatch and PSC limits. Under the more constraining options of Alternative 2, reduced PSC limits may result in some groundfish fisheries closing before the total allowable catch (TAC) is reached, which will result in less impact on the stock, or fishing occurring in areas of lower catch per unit

effort. While this may result in higher interception of incidental species, the groundfish stocks, forage fish and prohibited species are also managed under catch, bycatch and PSC limits, which mitigate risk to these stocks. For groundfish stocks, the biological effects are expected to be correctly incorporated in stock assessments and the harvest specifications system.

Marine mammal and seabird disturbance and incidental take are at low levels and are mitigated by groundfish fishery area closures. Under Alternative 2, there may be changes in fishing patterns that result in more fishing effort (at lower catch per unit effort), in response to potentially constraining PSC limits. This is most likely to occur in trawl fisheries, where limits are more constraining. Neither disturbance, incidental take, changes in prey availability or benthic habitat alteration, however, is anticipated to increase to a level that would result in population level effects on marine mammals or seabirds.

Previous analyses have found no substantial effects to habitat in the BSAI from fishing activities (NMFS 2005b). Under Alternative 2, any increase in fishing effort would still occur within the existing footprint of fishing and existing habitat and conservation measures, and is unlikely to be significant.

Regulatory Impact Review

The RIR describes the status quo with respect to participants in each of the affected sectors, catch and revenue, regional impacts, PSC limits and associated mortality in target fisheries, reliance on BSAI groundfish and diversification into other fisheries. A description of catch and revenue in the commercial halibut fishery is also included, along with a summary of its regional impact. To analyze the effects of Alternative 2, the analysis uses an iterated multi-year simulation model, which uses the basis years of 2008 to 2013 to forecast future impacts of the PSC limit reductions. There are two aspects to the modeling of impacts of PSC limit reductions: how to account for fishermen's response to constraining limits by optimizing their groundfish fishing to the extent possible (noting that their ability to respond effectively is more difficult when PSC limit reductions, or other management measures affecting them, are more constraining), and how "savings" of halibut PSC mortality in the groundfish fisheries affect other sectors, in this case, the commercial halibut fishery. The model uses two scenarios to mimic how industry would respond to a lower PSC limit. The scenarios employ different methods of dropping groundfish harvest records to meet the new PSC limit, and are intended to represent reasonable lower and upper bounds of the impact of the PSC limit reduction. For the impact on the halibut fishery, the model uses algorithms that mimic the IPHC process to generate recommendations for the coming year's Fishery Constant Exploitation Yield (FCEY), or catch limit for the directed halibut fishery, including taking into account the O26/U26 proportion of halibut PSC mortality.

Table ES-1 summarizes the Alternative 2 PSC limit reduction options in terms of their halibut PSC mortality reductions in the groundfish fishery and the foregone net present value associated with those reductions. The table also shows how halibut PSC reductions would translate into reallocations to the directed halibut fishery yield in terms of O26 fish, and the associated gain in net present value, as well as Area 4's proportionate share of a potential future U26 yield.

Only some of the options would result in a change to the status quo, given that the sectors regularly harvest less than the regulated PSC limit.

- For the Bering Sea trawl limited access sector (Option 2), all of the PSC limit reduction options would have been constraining in some years from 2008 to 2013, and all of the options are likely to be constraining in future years.
- For the Amendment 80 sector (Option 3), all of the PSC limit reduction options would have been constraining in some of the years 2008 to 2013, and all of the options are likely to be constraining in future years.

- For Pacific cod longline catcher processors (Option 5), only reductions of 30 or 35 percent would be likely to constrain this sector in the future. Reductions of 10 or 20 percent would not have constrained the fishery in any of the years from 2008 to 2013, and unless the Pacific cod TACs grow considerably larger in future, these options are unlikely to be constraining.
- For CDQ groups (Option 6), only a reduction of 35 percent would be likely to constrain this fishery in the future, unless the fishery continues its current rate of growth. Reductions from 10 to 30 percent would not have constrained the CDQ groundfish activities in any of the years from 2008 to 2013.
- There would not have been an effect of any of the reduction options on Pacific cod longline catcher vessels (Option 4), or the PSC limit that is apportioned to other non-trawl fisheries (i.e., targeting species other than Pacific cod or sablefish) (Option 7), during the years 2008 to 2013. Given the current lack of growth in either of these fisheries, it is unlikely that any of the proposed options would be constraining in the future.

Table ES-1 Comparison of alternatives and major impacts

| BSAI Groundfish Fisheries | | | | | Commercial Halibut Fishery in Area 4 | | | | |
|---|----------------------------|---------------|--|--|---|-------------|---------------|------------------------------------|---|
| Current PSC Limit | Mean PSC Used ¹ | New PSC Limit | Average PSC Reductions ² | Foregone Net Present Value | Reallocated Yield to Commercial Halibut Fishery from O26 Fish | | | Potential Yield in Area 4 from U26 | Gain of Net Present Value from O26 Fish |
| Halibut PSC Mortality (round mt) | | | | 2013\$ Million | 4A | 4B | 4CDE | | 2013\$ Million |
| | | | | | net weight pounds (1,000s) | | | | |
| Option 2, Affecting BSAI Trawl Limited Access Sector | | | | | | | | | |
| a) -10% | | 788 | 12 – 17 | \$10 – \$16 | 4.0 – 6.4 | 0.4 – 0.5 | 5.3 – 6.3 | 1.6 – 2.1 | \$1.0 – \$1.4 |
| b) -20% | 875 | 700 | 27 – 39 | \$30 – \$50 | 8.9 – 11.9 | 1.6 – 2.4 | 11.1 – 16.7 | 3.5 – 5.0 | \$2 – \$3 |
| c) -30% | | 613 | 44 – 70 | \$62 – \$92 | 15.0 – 24.8 | 3.4 – 4.0 | 17.0 – 25.6 | 5.7 – 8.8 | \$4 – \$6 |
| d) -35% | | 569 | 55 – 99 | \$78 – \$145 | 17.4 – 37.2 | 4.2 – 5.2 | 22.0 – 35.9 | 7.1 – 12.7 | \$5 – \$8 |
| Option 3, Affecting Amendment 80 Catcher Processors | | | | | | | | | |
| a) -10% | | 2093 | 40 – 57 | \$10 – \$19 | 3.0 – 1.6 | 0.1 – 0.0 | 36.2 – 54.3 | 5.0 – 7.1 | \$4 – \$6 |
| b) -20% | 2,325 | 2,037 | 191 – 212 | \$52 – \$115 | 25.7 – 23.9 | 0.1 – 0.0 | 162.6 – 184.6 | 23.8 – 26.3 | \$20 – \$22 |
| c) -30% | | 1628 | 414 – 441 | \$161 – \$285 | 59.3 – 66.6 | 18.7 – 11.6 | 327.5 – 352.8 | 51.2 – 54.4 | \$44 – \$46 |
| d) -35% | | 1511 | 531 – 555 | \$224 – \$368 | 79.6 – 87.9 | 32.4 – 14.2 | 406.5 – 439.6 | 65.5 – 68.5 | \$56 – \$58 |
| Option 4, Affecting Pacific Cod Hook and Line Catcher Processors | | | | | | | | | |
| All options | 15 | 3 | 10–14 | There are no material impacts under any of the options | | | | | |
| Option 5, Affecting Pacific Cod Hook and Line Catcher Vessels | | | | | | | | | |
| a) -10% | | 684 | There are no material impacts under option (a) | | | | | | |
| b) -20% | 760 | 521 | 608 | There are no material impacts under option (b) | | | | | |
| c) -30% | | 532 | 13 – 30 | \$10 – \$24 | 2.0 – 5.4 | 0.7 – 4.1 | 11.5 – 22.9 | 1.8 – 4.1 | \$1.5 – \$3.5 |
| d) -35% | | 494 | 34 – 51 | \$27 – \$50 | 3.3 – 8.5 | 5.9 – 6.5 | 26.8 – 40.2 | 4.6 – 7.0 | \$4 – \$6 |
| Option 6, Affecting CDQ | | | | | | | | | |
| a) -10% | | 354 | There are no material impacts under option (a) | | | | | | |
| b) -20% | 393 | 210 | 314 | There are no material impacts under option (b) | | | | | |
| c) -30% | | 275 | There are no material impacts under option (c) | | | | | | |
| d) -35% | | 255 | 2 – 2 | \$0.5 – \$2 | 0.5 – 1.2 | 0.0 – 0.0 | 1.7 – 0.3 | 0.3 – 0.2 | \$0.23 – \$0.16 |
| Option 7, Affecting Hook and Line for Other Targets | | | | | | | | | |
| All options | 58 | 5 | 38–52 | There are no material impacts under any of the options | | | | | |

Note, when numbers are shown as a range, they represent estimates from two Scenarios—Scenario A is a relatively “low impact” scenario and Scenario B is a relatively “high impact” scenario.

¹ 2008 to 2013

² With the exception of columns showing current and proposed PSC limits, all of the numbers in the table are estimated using the simulation model developed to assess the impacts of the proposed reductions in PSC limits. The model assumes that historical fishing years from 2008 to 2013 repeat themselves randomly out into the future. If one of those years was a “high bycatch” year then that year would have been affected by the reduced PSC limit when other “low bycatch” years would not have been affected. This explains why there are projected impacts to vessels participating in BSAI Trawl Limited Access fisheries under Option 2(a) and Option 2(b), even though the “mean PSC used”, which is an output of the model, is less than or equal to the “New” PSC Limit.