

# Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement

## Supplemental Information Report

**FINAL**

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*North Pacific Fishery Management Council  
National Marine Fisheries Service, Alaska Region*

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# 1 Introduction

The North Pacific Fishery Management Council (Council) developed its groundfish management policy in 2004, following a comprehensive review of the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) groundfish fisheries. The *Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement* (2004 PSEIS; NMFS 2004) evaluated the cumulative changes in the management of the groundfish fisheries since the implementation of the Fishery Management Plan for the Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) and the Fishery Management Plan for the Groundfish of the Gulf of Alaska (GOA FMP) and considered a broad array of policy-level programmatic alternatives. On the basis of the analysis, the Council adopted a management approach statement, and nine policy goal statements with 45 accompanying objectives. The management policy is included in full in Appendix 1.

Periodically, the Council conducts a review of the nine policy goal statements and accompanying objectives to assess how they are being implemented, and see whether changes are warranted.<sup>1</sup> In February 2012, in conjunction with this review, the Council also reviewed a discussion paper identifying factors that may influence the timing for supplementing or updating the 2004 PSEIS. An expanded discussion paper was later reviewed in June 2012. To determine if a revision or supplement to the 2004 PSEIS was necessary, the Council and NMFS decided first to conduct a “non-NEPA” evaluation of the 2004 PSEIS using a supplemental information report (SIR).

A SIR is a tool to evaluate the need to prepare a new environmental impact statement (EIS) to supplement a previous EIS. The National Environmental Policy Act (NEPA) requires agencies to prepare a supplemental EIS (SEIS) to either draft or final EISs if the agency (1) makes substantial changes in the proposed action that are relevant to environmental concerns; or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9(c)). An SEIS is required if the new information is sufficient to show a proposed or remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered. If a subsequent related Federal action occurs, and new information indicates that the subsequent action will affect the quality of the human environment in a significant manner or to a significant extent not already considered, an SEIS must be prepared. Courts have upheld the use of SIRs, and similar non-NEPA evaluation procedures, for the purpose of determining whether new information or changed circumstances require the preparation of a supplemental EIS.

With this SIR analysis, the Council and NMFS have been able to determine whether the triggers for supplementing the PSEIS have been met. In April 2014, the Council evaluated the information in the draft SIR, and concluded both that a supplemental EIS was not required, and also that they did not choose to reinitiate programmatic changes to the groundfish fisheries that would necessitate an SEIS. NMFS has since finalized the SIR and reached a determination affirming that the 2004 PSEIS continues to provide NEPA compliance for the groundfish FMPs.

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<sup>1</sup> Changes to the management approach statement, the nine policy goal statements, or the 45 objectives would require an FMP amendment.

## 2 Considerations for Supplementing the 2004 PSEIS

### 2.1 What triggers the need to prepare an EIS?

NEPA requires that an EIS be prepared on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment (40 CFR 1502.3). EISs are also prepared (1) when the proposed action is novel, (2) when there is controversy in the underlying science used to understand the impacts of the alternatives, or (3) when the potential impacts are unknown. Courts have also found that significant scientific differences of opinion, controversy, and uncertainty require preparation of an EIS.<sup>2</sup>

### 2.2 What is a programmatic EIS?

A “major Federal action” includes adoption of official policy, formal plans, programs, and specific projects (40 CFR 1508.18). When the EIS addresses a policy, plan, or program, it is called a programmatic EIS or PEIS. PEISs should focus on broad Federal proposals and be timed to coincide with meaningful points in planning and decision making. Preparing a PEIS presents an opportunity to evaluate cumulative impacts of past, present, and reasonably foreseeable future actions under the program or within a geographical area. NEPA’s legal requirements for a PEIS are the same as those for an EIS.

### 2.3 What triggers the need to prepare a supplemental EIS?

NEPA requires agencies to prepare an SEIS to either draft or final EISs if the agency (1) makes substantial changes in the proposed action that are relevant to environmental concerns, or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9(c)). An agency need not supplement an EIS every time new information comes to light. Not every change requires the preparation of an SEIS; only those changes that cause effects that are significantly different from those already studied require supplementary consideration.<sup>3</sup> The Supreme Court explained that “an agency need not supplement an EIS every time new information comes to light after the EIS is finalized. To require otherwise would render agency decision-making intractable.”<sup>4</sup>

An SEIS is required if the new information is sufficient to show a proposed or remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered.<sup>5</sup> If a subsequent related Federal action occurs, and new information indicates that the subsequent action will affect the quality of the human environment in a significant manner or to a significant extent not already considered, an SEIS must be prepared.<sup>6</sup>

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<sup>2</sup> State of Alaska v. Lubchenco, No. 3:10-CV-00271-TMB, order requiring plaintiffs to prepare an EIS at 8 n.36 (D. Alaska, filed March 5, 2012). See footnote 36.

<sup>3</sup> See Davis v. Latschar, 202 F.3d 359, 369 (D.C. Cir. 2000).

<sup>4</sup> See Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 373 (1989); Oregon Natural Resources Council v. Marsh, 845 F.Supp. 758, 766-69 (D. Ore. 1994), *aff'd in part, reversed in part*, Oregon Natural Resources Council v. Harell, 25 F.3d 1499 (9<sup>th</sup> Cir. 1995)

<sup>5</sup> Marsh 490, at 374. Colorado Environmental Coalition v. Dombeck, 185 F3d 1162, 1177-78 (10th Cir. 1999), Nat'l Resources Defense Council v. Lujan, 768 F. Supp 870, 885-89 (D.D.C. 1991)

<sup>6</sup> See Marsh, 490 U.S. at 374.

## 2.4 What is the history leading to the 2004 PSEIS?

The Council and NMFS prepared EISs for the original BSAI FMP and GOA FMP, finalized in 1981 and 1979, respectively. In March 1997, NMFS issued a Notice of Intent to prepare an SEIS on “the Federal action by which total allowable catch specifications and prohibited species catch limits in the groundfish fisheries that are conducted in the Bering Sea and Aleutian Islands Area and the Gulf of Alaska are annually established and apportioned.” (62 FR 15151, March 31, 1997). NMFS explained why the SEIS was needed:

The fisheries have evolved ... through the Council process including FMP amendments, regulations, and continued compliance with other Federal laws and executive orders. The frequencies of marine mammal, marine bird, and fish species in the biological assemblage present now are different from frequencies that existed and were displayed in [the EISs prepared for the original FMPs]. Several marine species have been listed under the Endangered Species Act, some of which may be affected by fishery management actions. New information about the ecosystem, impacts of the fisheries, and management tools has become available since the EISs were prepared (62 FR 15152, March 31, 1997).

Given these changes and new information, NMFS stated that the SEIS would incorporate the following:

... the amendments to the FMPs; the annual process for determining the [total allowable catch] TAC specifications; and the public processes for in place for implementing new regulations, revising existing ones, and incorporating new information. ... The SEIS will analyze the process by which annual TAC specifications and prohibited species catch limits are determined, together with the procedures for implementing changes to those processes. The processes encompass decisions about location and timing of each fishery, harvestable amounts, exploitation rates, exploited species, groupings of exploited species, gear types and groupings, allocations, product quality, organic waste and secondary utilization, at-sea and on-land organic discard, species at higher and lower trophic levels, habitat alterations, and relative impacts to coastal communities, society, the economy, and the domestic and foreign groundfish markets. Effects of these decisions are manifested over many years in multifaceted social and biological arenas. Inherent in implementing groundfish fisheries management regime are commitments to provide in-season management, enforcement, monitoring, stock assessment, and summary analyses. In addition to evaluating the no Action Alternative, the SEIS will include a full range of alternatives and discussions of their potential impacts on the biological and socioeconomic environments. (62 FR 15152, March 31, 1997).

Other than the general description alternatives quoted above, no specific alternatives were identified in the Notice of Intent.

NMFS issued a Final SEIS in December 1998 (1998 SEIS; NMFS 1998). The 1998 SEIS stated that the attainment of Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) goals and NEPA regulations require a periodic evaluation of the impacts of the BSAI and GOA groundfish fisheries on (1) the stocks of fish taken as catch and bycatch in the groundfish fisheries, (2) protected species including marine mammals and seabirds, (3) other components of the BSAI and GOA ecosystems, (4) habitat, and (5) those who benefit from consumptive and non-consumptive uses of the living marine resources of the BSAI and GOA.<sup>7</sup> The 1998 SEIS updated the scientific information known about the North Pacific ecosystem, and analyzed this information by considering a range of

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<sup>7</sup> 1998 SEIS, at 2.

alternative total allowable catch (TAC) levels: (1) the status quo method of setting TAC levels annually, for each species complex, within the optimum yield (OY) range based on the biological status of the species and “other ecological and socio-economic aspects of the fisheries”; (2) setting TAC levels at the lower end of the OY range; (3) setting TAC levels at the upper end of the OY range; and (4) no directed groundfish fishing. The SEIS did not consider how new information about the affected environment related to other aspects of the fisheries that the FMPs regulate, such as time and area closures, gear restrictions, bycatch limits of prohibited species, and allocations of TACs among vessels delivering to different types of processors groups, gear types, and qualifying communities.

## 2.5 Why did the court determine a programmatic SEIS was needed?

The adequacy of the 1998 SEIS was challenged in U.S. district court.<sup>8</sup> The plaintiffs argued that NEPA required NMFS to prepare an SEIS that included alternatives commensurate with the broad scope of the FMPs.<sup>9</sup> Because the 1998 SEIS analyzed the new information under a range of alternatives dealing with only one particular aspect of the FMPs – TAC levels – the plaintiffs argued that the scope of the 1998 SEIS was impermissibly narrow.<sup>10</sup> By narrowing the range of alternatives to those specifically dealing with TAC levels rather than the FMPs as a whole, the plaintiffs argued that NMFS failed to take the requisite “hard look” at the environmental consequences of the agency action, the FMPs.<sup>11</sup> NMFS argued that the agency properly defined the scope of the SEIS and considered an adequate range of alternatives.<sup>12</sup>

In July 1999, the court ruled that the 1998 SEIS was impermissibly narrow and thus legally inadequate under NEPA, and remanded the document back to NMFS for additional analysis, directing the agency to produce a “programmatic” SEIS.<sup>13</sup> Briefly stated, the court determined a broad programmatic SEIS that fairly evaluated the dramatic and significant changes that occurred in the groundfish fisheries in North Pacific ecosystem was required by NEPA “[i]n light of the significant changes to the FMPs and the new information about the broad range of issues” covered by the regulations managing the fisheries.<sup>14</sup> Because the 1998 SEIS narrowly focused its analysis on TAC levels, the court determined that it was not sufficiently broad.<sup>15</sup>

In reaching this conclusion, the court first determined that the action under review in the 1998 SEIS should have been the FMPs and the numerous regulations managing the groundfish fisheries. The court noted that the FMPs constituted major Federal actions requiring an EIS,<sup>16</sup> that NMFS seemed to acknowledge that an SEIS to the original EISs was necessary under both the “substantial changes to the action” and the “significant new information” prongs of 40 CFR 1502.9(c),<sup>17</sup> and that the level of detail necessary in an SEIS is directly related to scope of Federal action under NEPA review.<sup>18</sup> Because the FMPs as a whole were the proposed action about which there were significant new circumstances and to which substantial changes had been made, an SEIS that examined only one aspect of the FMPs, TAC

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<sup>8</sup> *Greenpeace v. National Marine Fisheries Service*, 55 F.Supp. 2d 1248 (W.D. Wash. 1999).

<sup>9</sup> *Id.*, at 1270.

<sup>10</sup> *Id.*, at 1271-72.

<sup>11</sup> *Id.*, at 1272.

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*, at 1273.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*, at 1275.

<sup>16</sup> *Id.*, at 1257.

<sup>17</sup> *Id.*, at 1271.

<sup>18</sup> *Id.*, at 1276.

levels, was insufficient to satisfy the requirements at 40 CFR 1502.9(c). The court also found that the SEIS lacked any explanation of why and how analysis of TAC levels “results in a practical analysis” of the impact of the fisheries, as governed by a myriad of regulations.<sup>19</sup> The court's determination that the SEIS must be treated as a broad, programmatic analysis of the FMPs as a whole lead directly to its conclusion that the range of alternatives considered in the 1998 SEIS was inadequate.<sup>20</sup>

The court also determined that NEPA regulations at 40 CFR 1508.7 and 1508.27(b)(7) required NMFS to prepare an analysis that thoroughly examined the cumulative effects of the changes that had occurred to the FMPs.<sup>21</sup> The court concluded that the “vast changes to the FMPs have reached the threshold of ‘cumulatively significant impact on the human environment,’ thereby requiring preparation of an SEIS addressing these vast changes.”<sup>22</sup>

In summary, the court stated that NEPA requires NMFS to analyze the ways in which the groundfish fisheries affect the North Pacific ecosystem, and to provide decision-makers and the public with a document that will help further informed decision-making as to the consequences of the FMPs.<sup>23</sup> The 1998 SEIS, by focusing its analysis only on TAC levels, did not fulfill this mandate.<sup>24</sup>

## 2.6 Will the Council and NMFS have to prepare a new PSEIS at some point?

As stated in numerous court decisions, Federal agencies have a continuing duty to gather and evaluate new information relevant to the environmental impacts of its actions and to review the continuing vitality of an EIS in light of changing conditions.<sup>25</sup> As stated in Friends of the Clearwater v. Dombeck:

“...[A]n agency that has prepared an EIS cannot simply rest on the original document. The agency must be alert to new information that may alter the results of its original environmental analysis, and continue to take a “hard look at the environmental effects of [its] planned action, even after a proposal has received initial approval. It must “ma[ke] a reasoned decision based on ... the significance or lack of significance – of the new information,” and prepare a supplemental EIS when there are “significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” “If there remains major Federal action to occur, and the new information is sufficient to show that the remaining action will affect

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<sup>19</sup> Id., at 1275.

<sup>20</sup> Id., 1274.

<sup>21</sup> Id., at 1273-74.

<sup>22</sup> Id., at 1274.

<sup>23</sup> Id., at 1276.

<sup>24</sup> Id.

<sup>25</sup> See Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017, 1023-1024 (9<sup>th</sup> Cir. 1980); Monarch Chemical Works v. Exon, 452 F.Supp 493, 500 (D.C. Neb. 1978). See also Southern Oregon Citizens v. Clark, 720 F.2d 1475, 1480 (9<sup>th</sup> Cir. 1983). This continuing duty is especially relevant where the original EIS covers a series of actions continuing over a decade. ... In general, an EIS concerning an ongoing action more than five years old should be carefully examined to determine whether a supplement is needed); Senville v. Peters, 327 F.Supp.2d 335, 355-56 (D. Vt. 2004) – An agency's duty to take a hard look at the environmental consequences of its proposed action does not end with publication of an EIS. NEPA imposes an ongoing obligation to supplement EISs if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. The decision whether to prepare an SEIS is similar to the decision whether to prepare an EIS in the first place. Major Federal action, plus new information that shows “that the remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered,” dictates the preparation of an SEIS. Marsh 490, 360-61. The parties do not dispute that the proposed action is major, nor that there is new information. At issue is whether the new information results in impacts that are significantly different in degree or in kind from the impacts previously considered.

the quality of the human environment in a significant manner or to a significant extent not already considered, a supplemental EIS must be prepared.”<sup>26</sup>

The court in Friends of the Clearwater v. Dombek also stated: “As we have admonished, Compliance with NEPA is a primary duty of every Federal agency; fulfillment of this vital responsibility should not depend on the vigilance and limited resources of environmental plaintiffs.”<sup>27</sup> It is the agency, not an environmental plaintiff, that has a “continuing duty to gather and evaluate new information relevant to the environmental impact of its actions,” even after release of an EIS.

The Supreme Court has held that supplementation of an EIS is necessary only if there remains major Federal action to occur.<sup>28</sup> As the court in Defenders of Wildlife v. Bureau of Ocean Energy Management, Regulation, and Enforcement stated that:<sup>29</sup>

Although the case law is not uniform, a reasonable, helpful formulation of the “major Federal action” test provides that if “the actions remaining to the [agencies] ... are purely ministerial, or if the agencies have no discretion that might usefully be informed by further environmental review, then there is no major federal action and no SEIS must be prepared.” Hammond v. Norton, 370 F.Supp.2d 226, 255 (D.D.C.2005) (citing Citizens Against Rails-to-Trails v. Surface Transp. Bd., 267 F.3d 1144, 1151 (D.C.Cir.2001)); see also Southern Utah Wilderness Alliance v. Office of Surface Min. Reclamation and Enforcement, 2008 WL 4912058, \*12 (D.Utah Nov. 14, 2008) (no “major federal action” requiring supplemental EIS where agency “retained no discretion to decide whether the projects should go forward or to determine the terms and conditions of the projects' approval”).

Because fisheries management is dynamic – the FMPs are regularly amended to adjust fisheries management based on new circumstances, and new information on the environment and the impacts of fishing on the environment is continually being developed – and because the Council and the agency have broad discretion to manage fisheries consistent with the requirements of the MSA, the Council and the agency have a continuing duty to gather and evaluate new information relevant to the environmental impacts of its actions and to review the continuing vitality of its PSEIS in light of changing conditions.<sup>30</sup> When the changes and the information is significantly different in degree or in kind from the impacts previously considered, the Council and the agency must prepare a supplement to the PSEIS.

## **2.7 How do the Council and NMFS decide when it is time to initiate a new PSEIS?**

The passage of time alone does not trigger the need for a supplement. However, the Council of Environmental Quality (CEQ) advises in its Forty Most Asked Questions (46 FR 18026, March 23, 1981) that an EIS over five years old should be carefully scrutinized to determine whether there are changes in the action or the affected environment:

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<sup>26</sup> Quoting Marsh 490 U.S. at 374.

<sup>27</sup> City of Davis v. Coleman, 521 F.2d 661, 667 (9th Cir. 1975), see also Coalition for Canyon Preservation v. Bowers, 632 F.2d 774, 779 (9th Cir. 1980)

<sup>28</sup> Norton v. Southern Utah Wilderness Alliance 542 U.S. 55, 72-73 (2004)

<sup>29</sup> 791 F.Supp.2d 1158 (S.D.Ala. May 23, 2011)

<sup>30</sup> NEPA requires an agency to continue evaluating a project's environmental effects, even after preparation of an initial EIS. From Greenpeace Decision at 1259; see also Chemical Weapons v. U.S. Department of Army 935 F. Supp. 1206, 1217-19 (D. Utah 1996) (preliminary injunction denied on allegations of new information with respect to EIS on chemical weapons disposal facility; in this case, the daily operation will itself constitute major Federal action that would require a supplemental EIS if new information is sufficient to show that the remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered).

**Question No. 32:** Supplements to Old EISs. Under what circumstances do old EISs have to be supplemented before taking action on a proposal?

**A.** As a rule of thumb, if the proposal has not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in Section 1502.9 compel preparation of an EIS supplement.

If an agency has made a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, an SEIS must be prepared for an existing EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal (40 CFR 1502.9(c)).

To determine if an SEIS is necessary at this time, the Council and NMFS conducted a “non-NEPA” evaluation of the 2004 PSEIS resulting in this SIR. A SIR is a tool to evaluate the need to prepare a new EIS to supplement a previous EIS. Courts have upheld the use SIRs and similar non-NEPA evaluation procedures for the purpose of determining whether new information or changed circumstances require the preparation of a supplemental EIS.<sup>31</sup> This SIR discusses each of the considerations for an SEIS: changes to the action, new information, and new circumstances, and whether these changes are significant and relevant to environmental concerns and the impacts of the proposed action. Depending on the results of this analysis, the Council and NMFS may determine that the triggers for supplementing the PSEIS have not been met and therefore a new PSEIS is not necessary at this time. On the other hand, the SIR may provide detailed information demonstrating that the triggers have been met and that a new PSEIS should be prepared. Note that if the Council and NMFS determine new information or circumstances are significant, the Council or NMFS must prepare a supplemental EIS; a SIR cannot serve as a substitute.<sup>32</sup>

The Council also considered whether to initiate an environmental assessment or a supplemental EIS. The Council considered the following factors in its decision to do a SIR:

- A SIR is not a NEPA document; therefore the Council would retain some flexibility in defining the public participation process as well as general timing issues.
- A SIR could help inform the Council if it chooses to consider whether to revise the objectives, policy statements, or overall management approach for the groundfish fisheries found in the current FMP and NEPA analysis.
- A SIR could also inform the public and serve as a useful focal point for further discussions with the Council.
- Since a SIR cannot serve as a substitute for a proper NEPA document, an environmental assessment (EA) or supplemental EIS, once final, would ensure NEPA compliance.
- An EA or an SEIS would require a proposed action, purpose and need, and a reasonable range of alternatives and the related NEPA requirements for these documents.

The Council chose to move forward with a SIR, to:

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<sup>31</sup> Idaho Sporting Congress, Inc. v. Alexander, 222 F.3d 562, 566 (9<sup>th</sup> Cir. 2000), Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 383-85 (1989), Laguna Greenbelt, Inc. v. United States Dep't of Transp., 42 F.3d 517, 529-30 (9<sup>th</sup> Cir 1994), Price Rd. Neighborhood Ass'n v. United States Dep't of Transp., 113 F.3d 1505, 1510 (9<sup>th</sup> Cir. 1997)

<sup>32</sup> Idaho Sporting Congress, Inc. v. Alexander, 222 F.3d 562, 566 (9<sup>th</sup> Cir. 2000)

- Evaluate the changes to the action, Federal groundfish fisheries management, since the 2004 PSEIS using readily available information synthesized into a complete picture of today's fishery management so that it could be compared to the fishery management regime described under the preferred alternative in the 2004 PSEIS.
- Identify the new information available and new circumstances since 2004 by summarizing the new information in the stock assessment and fishery evaluation (SAFE) reports, recent analytical documents (EAs, EISs, and biological opinions), and any other sources.
- Evaluate whether the changes in the action, new information, and the new circumstances are significant and relevant to environmental concerns and the impacts of the proposed action by assessing whether the impacts predicted in the 2004 PSEIS for the preferred alternative are still valid given these changes since 2004.

This SIR enables the Council and NMFS to evaluate new information and make a reasoned determination whether it is sufficiently significant to require formal supplementation under NEPA. Courts have upheld an agency's decision not to supplement if it is reasonable. The reasonableness of an agency's decision not to supplement depends on such factors as the environmental significance of the new information, the probably accuracy of the information, the degree of care with which the agency considered the information and evaluated its impact, and the degree to which the agency supported its decision not to supplement with a statement of explanation or additional data.<sup>33</sup> The court plays the limited role of determining, under the foregoing standards, whether the new information is so significant that it would be irresponsible, arbitrary, and capricious for the agency not to act on it. However, the court would determine whether the new information presents a seriously different picture of the likely environmental consequences of the proposed action than the picture already considered. Resolution of this dispute involves primarily issues of fact requiring deference to the informed discretion of the responsible agency.<sup>34</sup>

## **2.8 What efficiencies are gained by doing an EIS?**

EISs are major undertakings, and the process to determine whether or not to supplement an existing EIS also requires substantial effort and analysis. However, as explained above, NEPA analysis is required for major Federal actions and once an EIS is completed, there is a continuing duty to make sure the analysis is relevant in light of new information, circumstances, or changes in the proposed action. Once an EIS is completed for a proposed action and that action is implemented, the EIS is useful for subsequent related actions and for understanding the impacts of specific actions in the larger context. Having an EIS can greatly streamline future NEPA analyses using tools described in the CEQ regulations. A comprehensive programmatic EIS can also allow other efficiencies for future NEPA analyses, such as tiering, incorporation by reference, or in applicable instances, allowing for categorical exclusions (see short summaries of these actions below).

The 2004 PSEIS implemented a change to the groundfish management policy. Each subsequent action to implement the policy has been evaluated in a separate NEPA document. The 2004 PSEIS provides the baseline for conducting NEPA analysis for groundfish management actions. NMFS and Council staff incorporate by reference the information in the 2004 PSEIS, and update as necessary in the NEPA analysis for a specific action. This allows the subsequent NEPA document to focus on recent information and information relevant to the action, without a large amount of background information, or a re-analysis

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<sup>33</sup> Oregon Natural Resources Council v. Marsh, 845 F.Supp. 758, 766-69 (D. Ore. 1994)

<sup>34</sup> Oregon Natural Resources Council v. Marsh, 845 F.Supp. 758, 766-69 (D. Ore. 1994)

of the status quo. Also, the 2004 PSEIS provided a comprehensive analysis of the cumulative effects and past actions that are relied on for groundfish action EAs.

### **Tiering**

Tiering means the coverage of general information in a PEIS with subsequent narrower EISs or EAs incorporating by reference the general discussions from the PEIS and concentrating solely on the issues specific to the subsequent project-specific action (40 CFR 1508.28, 40 CFR 1500.4(i), 1502.4(d), and 1502.20). The CEQ regulations encourage agencies preparing NEPA documents to “tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review.” Specifically, 40 CFR 1502.20 states the following:

Whenever a broad environmental impact statement has been prepared (such as a program or policy statement) and a subsequent statement or environmental assessment is then prepared on an action included within the entire program or policy (such as a site specific action) the subsequent statement or environmental assessment need only summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and shall concentrate on the issues specific to the subsequent action.

In 40 CFR 1508.28, the CEQ regulations further define tiering as “the coverage of general matters in broader environmental impact statements ... with subsequent narrower statements or environmental analyses incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.” This section of the CEQ regulations further notes that tiering is appropriate “when the sequence of statements or analyses is ... from a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.”

### **Incorporation by reference**

An EIS can incorporate by reference material from other sources (40 CFR 1502.21). Incorporated material must be cited and summarized in the EIS and must be publicly available. Information that is not publically available may not be incorporated by reference into an EA or EIS.

### **Categorical Exclusion**

NOAA Administrative Order 216-6 (NAO 216-6) sets forth requirements for implementing and documenting Categorical Exclusions (CEs). Section 5.05 provides information on the general requirements for CEs. Section 6.03 provides specific guidance on the use of CEs for various types of actions undertaken by NOAA. For example, Section 6.03a.3 provides guidance regarding CEs for management plan amendments (i.e., FMP amendments).

As defined in section 6.03a.3(b)(1) of NAO 216-6, a proposed action would be categorically excluded from the need to prepare an EA or an EIS if the proposed action is a minor change to a previously analyzed and approved action and the proposed change has no effect individually or cumulatively on the human environment.

## **2.9 What risks might be present if a NEPA-compliant programmatic SEIS is not in place?**

It is a statutory requirement to comply with NEPA. The primary means of enforcing NEPA is through lawsuits brought by concerned private citizens, interest groups, and state and local agencies (Bass et al., 2001). Plaintiffs typically ask for declaratory judgments establishing the government's NEPA obligations or a writ of mandamus ordering specific agency action to comply with NEPA (Bass et al., 2001). Plaintiffs may also seek preliminary injunction:

If a preliminary injunction is granted, courts will enjoin some or all project activities pending NEPA compliance, and may order appropriate NEPA documents to be prepared. ... Most courts decide to grant a preliminary injunction by balancing ... the plaintiff's probability of success on the merits of the claim, the harm to the plaintiff if the injunction is denied versus the harm to the defendant if it is granted, and whether the public interest would be served by granting the injunction. Courts may also be asked to issue a permanent injunction .... In some cases, a court may find a NEPA violation but deny an injunction based on equitable principles.

It should be noted that if a court does order a new NEPA document be prepared, the court will set the schedule, likely with input from both parties, but that such a schedule might not be favorable for the Council or NMFS.

### 3 Approach

The primary purpose of this SIR is to evaluate comprehensively whether either of the two requirements for supplementing an EIS has been met with respect to the 2004 PSEIS:

1. if NMFS and the Council have made a substantial change in the proposed action (i.e., the management of the Federal groundfish fisheries) that is relevant to environmental concerns, or
2. if there are significant new circumstances or information relevant to environmental concerns and bearing on the management of the groundfish fisheries or their impacts.

With respect to the first requirement, there have been changes to the management program since the 2004 PSEIS, as documented in the May 2012 discussion paper (NPFMC 2012). All management changes since 2004 have been subject to NEPA analysis. The Council's Scientific and Statistical Committee (SSC) discussed the management changes at their March 2012 meeting in Anchorage, Alaska, and determined that the changes are all consistent with the preferred alternative evaluated in the 2004 PSEIS. The management changes synthesized in this SIR are not identified as substantial changes relevant to environmental concerns.

As a result, this SIR focuses more on the second requirement, to allow NMFS and the Council to make a reasoned determination of whether, since the 2004 PSEIS was completed, there exist new circumstances or information that are sufficiently significant to require supplementation under NEPA. The goal is to evaluate whether information since 2004 indicates that the groundfish fisheries affect the quality of the human environment in a significant manner or to a significant extent that was not considered in the 2004 PSEIS.

This SIR evaluates whether there are significant new circumstances or information relevant to the groundfish fisheries by reevaluating the conclusions from the 2004 PSEIS in light of new information, to see whether there are likely to be changes to the impacts. This SIR provides information to answer two overarching questions:

- Are the impacts predicted in the 2004 PSEIS for the preferred alternative still valid, given any changes since 2004?
- Does the new information present a seriously different picture of the likely impacts of the groundfish fisheries on a particular resource, compared to what was considered in the 2004 PSEIS?

This has been addressed by analysts revisiting each of the 2004 PSEIS conclusions, and considering the following questions in light of new information:

- Has the way that the resource is managed under the groundfish FMPs changed?
- Has the status of the resource changed?
- Is there new information regarding the impacts of the groundfish fisheries on the resource?
- Are there new methods of analysis or protocols for evaluating impacts?
- Based on information that is available imminently or now, would a new analysis using the latest methods and information reach a seriously different conclusion?

Additionally, this SIR builds on the SSC's review of environmental impacts from the March 2012 meeting. The SSC considered whether, on the basis of existing analyses, the Council understands the environmental impacts of the groundfish management program today, by evaluating (1) whether environmental conditions affecting the fisheries have changed, (2) whether the status of fish stocks and other marine life has changed, and (3) the availability of new information. The SSC identified many continuing trends and variability in environmental conditions and status of stocks that were accounted for

in the 2004 PSEIS. There were, however, a few distinct areas that merit further investigation. These include the following:

- changes in the spatial and temporal distribution of the groundfish fisheries in response to fishery management changes, together with technical innovations, may have altered the environmental impact of fishing
- changes in species abundance affecting interactions with groundfish fisheries, particularly those species that are listed under the Endangered Species Act (ESA)
  - increase in the abundance of whale populations may be altering lower trophic level energy pathways in the region
  - the continued decline of the western portion of the western distinct population segment of Steller sea lions
  - the declining trend of Northern fur seal populations on the Pribilof Islands
  - increase in short-tailed albatross populations and potential for increased incidental take by fisheries
  - listing of certain crab stocks as overfished and consequent Council action restricting groundfish fisheries
  - increase in arrowtooth flounder and Pacific halibut populations in the GOA and Bering Sea (BS), and changes in the size at age of halibut
- changes in the ice extent and season in the BS and Arctic impacting the distribution and behavior of cetaceans and pinnipeds, as well as lower trophic levels and patterns of productivity. Resulting direct and indirect impacts of fishing activity are not well understood.

The advantage of focusing the SIR more comprehensively on the conclusions of the PSEIS, rather than limiting it specifically to the issues identified by the SSC, is that it provides updated information on the entire management program. By providing a more comprehensive evaluation of the current fisheries baseline, the final SIR can be incorporated by reference with the 2004 PSEIS when analyzing proposed groundfish management actions in future EAs. Even though a SIR is not a NEPA document, it can be referenced in NEPA analyses, especially if the overall conclusion of the SIR is that the PSEIS remains valid. In this way, the SIR will better meet the Council and NMFS' intent to develop a document that also improves efficiency for other management actions.

The approach used in this SIR is similar to that used for the 2010 Essential Fish Habitat (EFH) 5-year review. In that evaluation, stock assessment authors, and other experts, were asked to review EFH information contained in the Council's FMPs (and the 2005 EFH EIS, NMFS 2005) in the context of any new information. The authors were each asked to consider a series of questions about whether new information is available and relevant for identifying EFH for their species, whether changes in fishing activities over the time period were likely to have affected the fishing impacts analysis, and whether, based on these considerations, they concurred with the description of EFH and habitat associations that is included in the FMPs. In the case of the EFH 5-year review, the authors' responses were vetted through the Council's Groundfish Plan Teams, and then compiled into a summary report that was presented to the Council, upon which basis the Council subsequently initiated amendments to the FMPs.

For this SIR, a similar approach has been employed. Scientific experts have been identified for each of the resource components analyzed in the 2004 PSEIS, primarily Alaska Fisheries Science Center (AFSC) staff. In many cases, these are the lead authors that prepared those sections for the 2004 PSEIS, or who prepare annual stock assessments. These experts were asked to review the 2004 PSEIS analysis and conclusions, consider them in light of new information, and determine whether the 2004 conclusions are still valid. In order to provide everyone with a similar understanding of what is required in the review, staff facilitated a kickoff workshop to discuss the project, and prepared a template identifying the questions to be addressed (Appendix 2). The experts completed their review, and their contributions were

synthesized by Council and Alaska Region staff into a draft SIR. The draft SIR was presented to the Council's SSC and the Council in April 2014 for review, and a 60-day public comment period was offered at the request of stakeholders who wished to submit written comments. Minor revisions were made to the draft SIR, to address issues raised in public and Council comments. When revisions addressed information in the resource reviews, these were made in collaboration with the expert reviewers. Finally, the SIR was finalized with the agency's determination.

## **4 Description of the 2004 PSEIS**

### **4.1 History of the 2004 PSEIS**

In late 1990s, NMFS and the Council realized that they needed to take a broader view of the cumulative effects of their management decisions. Typically, the Council addresses a management problem by developing specific solutions. Staff analyzes alternatives to determine their direct effects in a variety of contexts, and the Council shares that analysis with the public prior to making a decision and forwarding that recommendation to the agency and the Secretary of Commerce for final review and approval.

Beginning in 2000, the Council and NMFS conducted a comprehensive, programmatic environmental review of the BSAI FMP and GOA FMP. The analysis evaluated the management of Alaska's groundfish fisheries from a policy-level perspective, with alternatives ranging from a more aggressive harvest management policy to a highly precautionary one. Each management policy was illustrated and framed with a range of management measures within which the Council would intend to implement the alternative. The 2004 PSEIS, published in June 2004, serves the Council and NMFS as the overarching EIS in support of Federal authorization of the groundfish fisheries off Alaska. It also described the physical, biological, and human environment; every fishery and gear type; and scientific data gaps and research needs.

In April 2004, the Council used this PSEIS as the basis for amending its FMPs to incorporate a new policy statement that communicates its intent to take a more precautionary approach to fishery management decision-making when faced with scientific uncertainty. The Council now routinely reviews its policy goals and objectives when making decisions and when developing its annual workplan.

One aspect of the 2004 PSEIS that made its preparation particularly challenging was that approximately 25 years of management decisions had to be evaluated as a cumulative whole. Both FMPs had over 80 plan amendments that had to be reviewed and analyzed, and the management program had changed substantially during the time period, from a fishery with a large foreign participation, to an exclusively domestic one. The next time it is appropriate to revisit the Council's management policy, and supplement the 2004 PSEIS, it should be more straightforward, as an environmental baseline has been established, and the new analysis will focus on the actions taken by the Council and NMFS since then.

### **4.2 What did the 2004 PSEIS analysis address?**

The Federal action that was analyzed in the 2004 PSEIS was the authorization of the groundfish fisheries under the existing management program. There were four policy-level alternatives included in the PSEIS, from which the Council crafted a fifth, preferred alternative (Table 1). For each alternative, a management approach statement was developed, with accompanying objectives. Example FMPs were included to illustrate how the Council might implement each policy alternative with specific management measures. For all alternatives except the status quo, the policy alternative was illustrated with two example FMPs, which were intended to indicate the range of management measures that might fall within the implementation of that alternative. Although the example FMPs were important to illustrate how a management policy might operate in practice, the adoption of the policy itself was the immediate outcome of the 2004 PSEIS. It was intended that the Council would undertake subsequent amendments to fully implement the new management policy, as illustrated in the example FMPs, over the next five to ten years.

### 4.3 Data used in the 2004 PSEIS analysis

The data used in the analysis of biological impacts for groundfish stocks was largely based on 2002 stock assessments, using data from the 2001 and 2002 surveys. For some other seabird and marine mammal species, the most recent assessment data may have been from 2000. For the economic analysis, the most recent year included in the detailed fishery analysis was 2001. This was the basis on which the draft PSEIS was prepared, and issued for public comment in 2003. Some adjustments were subsequently made during the preparation of the 2004 PSEIS, to take into account more recent information. For example, the results from the new model for assessing impacts of fishing on essential fish habitat were incorporated in the analysis. In general, however, the most recent information in the document dates from 2000 to 2002.

### 4.4 Impacts of the Preferred Alternative

The following subsections summarize conclusions for each resource component analyzed in the 2004 PSEIS. The impact analyses started with the baseline status of each resource category, and then evaluated how specific characteristics of each component would respond directly and indirectly to management actions under the preferred alternative (PA) FMP bookends, PA.1 and PA.2. The expected cumulative effects on that stock were also evaluated and discussed, building on the direct and indirect effects evaluations as a starting point, and then bringing in persistent past effects as well as reasonably foreseeable future natural events and human activities external to fisheries management.

Possible evaluations were significant and beneficial (S+), insignificant (I), significant and adverse (S-), and unknown (U). In addition, effects were classified as conditionally significant (CS+ or CS-), if significant effects could be expected under a plausible set of conditions. The intent of the conditional label was to imply uncertainty about whether an alternative FMP would actually result in conditions that led to a significant impact. When the conditional label was applied, a plausible mechanism for the impact and the conditions under which a significant impact would be realized was stated. In cases where data were lacking to rank an effect according to the significance criteria, the effect was determined to be unknown.

**Table 1 Alternatives analyzed in the 2004 PSEIS**

Alternative	Example FMP bookend(s)
<p><b>Alternative 1</b> <i>Continue Under the Current Risk Averse Management Policy</i></p>	<p><u>FMP 1</u></p> <ul style="list-style-type: none"> <li>• 2002 BSAI and GOA Groundfish FMPs</li> </ul>
<p><b>Alternative 2</b> <i>Adopt a More Aggressive Harvest Management Policy</i></p>	<p><u>Example FMP 2.1</u></p> <ul style="list-style-type: none"> <li>• remove constraints (remove buffer between acceptable biological catch (ABC) and overfishing level (OFL))</li> <li>• no OY cap</li> <li>• repeal all closures except Steller sea lion (SSL) measures</li> <li>• no prohibited species catch (PSC) limits or gear restrictions</li> <li>• repeal all catch share programs except American Fisheries Act (AFA) and Community Development Quota (CDQ)</li> <li>• repeal Observer Program and vessel monitoring system (VMS)</li> </ul> <p><u>Example FMP 2.2</u></p> <ul style="list-style-type: none"> <li>• remove OY cap</li> <li>• repeal any bycatch reduction incentives and restrictions except for PSC limits or improved retention/improved utilization (IRIU), including seabird avoidance requirements</li> </ul>
<p><b>Alternative 3</b> <i>Adopt a More Precautionary</i></p>	<p><u>Example FMP 3.1</u></p> <ul style="list-style-type: none"> <li>• formalize ABC greater than or equal to TAC in FMP</li> </ul>

Alternative	Example FMP bookend(s)
<p><b>Management Policy</b></p>	<ul style="list-style-type: none"> <li>• move sharks and skates into target category and develop criteria for all species in “other species” category</li> <li>• accelerate efforts to develop ecosystem indicators for use in TAC-setting</li> <li>• develop marine protected area (MPA) methodology and evaluate efficacy of existing closures</li> <li>• formal procedures to increase Alaska Native participation in management</li> <li>• 0-10% reduction in existing PSC limits</li> <li>• establish PSC limits for GOA salmon and crab</li> <li>• improve Observer Program</li> </ul> <p><u>Example FMP 3.2</u></p> <ul style="list-style-type: none"> <li>• incorporate uncertainty correction into ABC estimation</li> <li>• specify OY separately for each stock rather than for groundfish complex,</li> <li>• incorporate stock-specific reference points (e.g. <math>F_{60\%}</math> rather than <math>F_{40\%}</math> for rockfish)</li> <li>• move stocks from ‘other species’ category</li> <li>• close 0-20% of exclusive economic zone (EEZ) as an MPA to protect full range of habitats</li> <li>• no bottom trawl for pollock in GOA</li> <li>• comprehensive rationalization of all fisheries</li> <li>• reduce existing PSC limits by 10-30%</li> <li>• established PSC limits GOA salmon and crab</li> <li>• 100% observer coverage on vessels greater than 60 ft length overall.</li> </ul>
<p><b>Alternative 4 Adopt a Highly Precautionary Management Policy</b></p>	<p><u>Example FMP 4.1</u></p> <ul style="list-style-type: none"> <li>• increase buffer between OFL and ABC (<math>F_{75\%}</math> for Steller sea lion prey species and for rockfish)</li> <li>• reduce <math>max F_{ABC}</math> for stocks based on the lower bound of a confidence interval surrounding the survey biomass estimate)</li> <li>• set OY for each stock rather than for the groundfish complex</li> <li>• designate 20-50% of EEZ as no-take marine reserve covering full range of habitats (including Aleutian Islands special management area for coral, and spawning reserves)</li> <li>• reduce PSC limits and bycatch by 30-50%</li> <li>• 100% observer coverage on vessels greater than 60 ft LOA and 30% coverage on all other vessels</li> <li>• mandatory VMS</li> </ul> <p><u>Example FMP 4.2</u></p> <ul style="list-style-type: none"> <li>• no fishing until target fisheries can be shown to have no adverse effect on the resource and its environment</li> </ul>

Alternative	Example FMP bookend(s)
<p><b>Preferred Alternative</b>  <b><i>Adopt a conservative, precautionary approach to ecosystem-based fisheries management</i></b></p>	<p><u>Example FMP PA.1</u></p> <ul style="list-style-type: none"> <li>• formalize ABC greater than or equal to TAC in FMP</li> <li>• use harvest control rules to maintain spawning stock biomass</li> <li>• accelerate efforts to develop ecosystem indicators for use in TAC-setting</li> <li>• develop MPA methodology</li> <li>• consider 0-10% reduction of BSAI PSC limits</li> <li>• establish PSC limits or other measures in GOA for salmon, crab, and herring</li> <li>• continue rights-based management as needed</li> <li>• formal procedures to increase Alaska Native participation in management</li> </ul> <p><u>Example FMP PA.2</u></p> <ul style="list-style-type: none"> <li>• incorporate uncertainty correction into ABC estimation</li> <li>• periodically review OY caps to determine their relevancy</li> <li>• develop and implement criteria for use of ecosystem indicators in TAC-setting</li> <li>• develop appropriate harvest strategies for rockfish</li> <li>• develop criteria to manage target and non-target species consistently</li> <li>• re-examine existing area closures</li> <li>• consider adopting MPAs (0-20% of EEZ to protect full range of habitats, including as Aleutian Islands management area for coral)</li> <li>• no bottom trawl for pollock in GOA</li> <li>• reduce existing PSC limits 0-20%</li> <li>• establish PSC limits in GOA for salmon, crab, and herring</li> <li>• comprehensive rationalization of all fisheries</li> <li>• increase consultation with and representation of Alaska Natives in fishery management</li> <li>• improve observer coverage on all vessels</li> <li>• establish mandatory economic data collection</li> </ul>

**4.4.1 Target species direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2**

The 2004 PSEIS examined the potential direct, indirect, and cumulative effects that the implementation of the PA was expected to have on target species, prohibited species, forage fish species, other species, and non-specified species. The significance of these effects was evaluated as to whether the impacts, within the PA fishery management regime, might be reasonably expected to jeopardize the sustainability of each target species or species group. The effects are described below:

**Direct Effects**

Fishing Mortality: This is the rate at which the stock is depleted by direct mortality imposed by removing the fish from the sea.

Change in Biomass Level: This is the change over time in the biomass of the stock, as measured in metric tons (mt). Two measures are used: total biomass, which is the estimated biomass of the entire stock, and spawning biomass, which is the estimated biomass of all of the spawning females in the stock.

Spatial/Temporal Concentration of Catch: This is the degree to which the fishery will concentrate in a particular geographic area during a particular period of time each season. This pattern in space and time can affect fishing mortality and can also influence habitat suitability for spawning, rearing, and feeding.

## Direct and/or Indirect Effects

Habitat Suitability: This is the degree to which habitat has the right characteristics to support the stock at one or more life-history stages (spawning, rearing of juveniles, availability of food at all stages, availability of refuge areas to allow escape from predators at all stages). Habitat suitability can be affected directly, for example by mechanical damage from bottom trawling, or influenced indirectly, for example by the gradual depletion of corals that provide hard substrate.

Prey Availability: This is the extent to which prey species are present in the environment and available as food to the stock. Like habitat suitability, this measure can be affected directly, for example by the direct removal of prey species by the fishery, or indirectly, for example by a change in the structure of the food web.

The baseline status of the BSAI and GOA stocks was their status in 2002, and the analysis then used a computer-based analytic model to project how specific characteristics of these stocks would respond directly and indirectly to management actions under the preferred alternative FMP bookends. Relevant data were not always available for all stocks.

Target species were unique, in that thresholds for overfishing and stock size had been developed that relate to sustainability of the stock. As such, these thresholds were used to evaluate the significance of the effects of the example FMPs relative to their impacts on the sustainability of the target species. Fishing mortality rates that exceeded the overfishing mortality rate were considered to jeopardize the capacity of the stock to produce maximum sustainable yield (MSY) on a continuing basis and adversely impact the sustainability of the stock. A related measure of this potential was indicated by change in biomass levels. The significance of effects of the current spatial/temporal concentration of the catch, and the level of prey availability and habitat suitability for target species were evaluated with respect to each stock's current size relative to its maximum stock size threshold (MSST). An action that jeopardized the stock's ability to sustain itself at or above its MSST was considered to adversely affect the sustainability of the stock.

Species or species complexes that fall within Tiers 1 through 5 have estimates of fishing mortality rates, and were evaluated with respect to exceeding the overfishing mortality rate (fishing mortality effect). Species or species complexes that fall within Tiers 1, 2, or 3 have reliable estimates of MSST, and were evaluated for the effects on spatial/temporal concentration of the catch, prey availability, and habitat suitability. Species or species complexes that fall within Tiers 4, 5, or 6 do not have reliable estimates of MSST, and therefore could not be evaluated for the significance of these effects. Since several species or species complexes did not have estimates of abundances-at-age, in the 2004 PSEIS version of the model their abundance levels simply reflected the most recent estimate. This inability to evaluate the significance of the effects also occurs for the forage, prohibited, and non-specified species. For these groups, analysis of the effects of the preferred alternative was limited to catch projections and likely consequences given patterns in related fauna.

For the non-specified species FMP category, grenadiers were the major catch, and were chosen to illustrate potential effects to non-specified species. Non-specified species was a huge and diverse category encompassing every species not listed in the current FMP as a target, prohibited, forage, or other species. Considering a single species group from this category, such as grenadier, cannot possibly represent the diverse effects to all species in the category. However, because information is lacking for nearly all non-specified species, and due to the small or unknown amounts of bycatch (due to a lack of reporting requirements in this category), only potential effects to grenadier were discussed.

Formal stock assessments had not been conducted for grenadier. Thus, changes in total biomass, reproductive success, genetic structure of population, habitat, or mortality rates under the preferred alternative could be determined due to the lack of information needed to establish the baseline condition.

Changes in bycatch of grenadier were predicted based on modeled changes in target species catches and population trajectories (sablefish target fisheries accounted for the highest grenadier bycatch). While changes in bycatch mortality relative to the comparative baseline were reported, the 2004 PSEIS emphasized that determinations could not be made as to how these changes actually impacted grenadier populations, or whether these impacts might be adverse, beneficial, or insignificant.

**Table 2 Target groundfish species significance ratings in the 2004 PSEIS**

Effect		Pollock, Pacific Cod, Sablefish	BSAI Atka Mackerel	GOA Atka Mackerel	BSAI Flatfish*	BSAI Other Flatfish	GOA Flatfish*	GOA Arrowtooth Flounder
<b>Mortality</b>	direct/ indirect	I	I	U	I	I	I	I
	cumulative	I	I	U	I	I	I	I
<b>Change in Biomass</b>	direct/ indirect	I	I	U	I	U	U	I
	cumulative	I	I	U	I	U	U	I
<b>Spatial/ Temporal Concentration of Catch - <i>change in genetic structure</i></b>	direct/ indirect	I	I	U	I	U	U	I
	cumulative	I	I	U	I	U	U	I
<b>Spatial/ Temporal Concentration of Catch - <i>change in reproductive success</i></b>	direct/ indirect	I	I	U	I	U	U	I
	cumulative	I	I	U	I	U	U	I
<b>Change in Prey Availability</b>	direct/ indirect	I	I	I	I	U	U	I
	cumulative	I	I	U	I	U	U	I
<b>Change in Habitat</b>	direct/ indirect	I	I	U	I	U	U	I
	cumulative	I	I	U	I	U	U	I

\*BSAI flatfish includes BSAI yellowfin sole, BSAI flathead sole, BSAI rock sole, BSAI arrowtooth flounder, BSAI Greenland turbot, and BSAI Alaska plaice

\*GOA flatfish includes GOA shallow water flatfish, GOA flathead sole, GOA deep water flatfish and GOA rex sole

Effect		BSAI and GOA POP	GOA Thornyhead Rockfish	BSAI Rockfish*	GOA Rockfish*	GOA Northern Rockfish
<b>Mortality</b>	direct/ indirect	I	I	I	I	I
	cumulative	I	I	I	I	I
<b>Change in Biomass</b>	direct/ indirect	I	I	U	U	I
	cumulative	I	I	U	U	I
<b>Spatial/ Temporal Concentration of Catch - <i>change in genetic structure</i></b>	direct/ indirect	I	I	U	U	I
	cumulative	I	I	U	U	I
<b>Spatial/ Temporal Concentration of Catch - <i>change in reproductive success</i></b>	direct/ indirect	I	I	U	U	I
	cumulative	I	I	U	U	I
<b>Change in prey availability</b>	direct/ indirect	I	I	U	U	I
	cumulative	I	I	U	U	I
<b>Change in Habitat</b>	direct/ indirect	I	I	U	U	I
	cumulative	I	I	U	U	I

\*BSAI rockfish includes BSAI northern rockfish, BSAI shortraker/rougheye rockfish and BSAI other rockfish

\*GOA rockfish includes GOA shortraker/rougheye rockfish, GOA slope rockfish, GOA pelagic shelf rockfish and GOA demersal shelf rockfish

**Table 3 Non-target fish species significance ratings in the 2004 PSEIS**

Effect		Other species (squid, octopus, sharks, sculpins, skates)	Forage fish	Non-specified species (Grenadier)
<b>Mortality</b>	direct/ indirect	U	I	U
	cumulative	U	I	U
<b>Change in biomass level</b>	direct/ indirect	U	U	U
	cumulative	U	U	U
<b>Change in reproductive success</b>	direct/ indirect	U	U	U
	cumulative	U	U	U
<b>Change in prey availability</b>	direct/ indirect	n/a	U	n/a
	cumulative	n/a	U	n/a
<b>Change in habitat</b>	direct/ indirect	U	U	n/a
	cumulative	U	U	n/a
<b>Change in genetic structure</b>	direct/ indirect	U	U	U
	cumulative	U	U	U

**4.4.2 Prohibited species direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2**

The 2004 PSEIS examined the potential direct, indirect, and cumulative effects that the implementation of the preferred alternative was expected to have on the prohibited species. As described above, the significance of the impacts for prohibited species were evaluated with respect to five effects: (1) fishing mortality, (2) change in biomass level, (3) spatial/temporal concentration of the catch, (4) prey availability, and (5) habitat suitability. The significance of these effects was evaluated as to whether the impacts, within the preferred alternative fishery management regime, might be reasonably expected to jeopardize the sustainability of the species. Because relevant data were not always available for all stocks, for these groups, analysis of the effects of the preferred alternative was limited to catch projections and likely consequences given patterns in related fauna. When data gaps prevented application of the model to a specific stock, the projected direct or indirect effect was evaluated as unknown (U).

**Table 4 Prohibited species significance ratings in the 2004 PSEIS**

Effect		Pacific halibut	BSAI salmon *	GOA Chinook salmon	GOA other salmon	Pacific herring	BSAI crab*	GOA crab*	GOA red king crab	BSAI and GOA golden king crab
<b>Mortality</b>	direct/ indirect	I	I	I	I	I	I	U	I	U
	cumulative	I	CS-	CS-	I	I	U	U	U	U
<b>Change in biomass level</b>	direct/ indirect	n/a	n/a	n/a	n/a	n/a	I	U	I	U
	cumulative	n/a	n/a	n/a	n/a	n/a	U	U	U	U
<b>Change in reproductive success</b>	direct/ indirect	I	U	U	U	I	U	U	U	U
	cumulative	I	CS-	U	U	I	U	U	U	U
<b>Change in prey availability</b>	direct/ indirect	I	U	U	U	I	U	U	U	U
	cumulative	I	U	U	U	U	U	U	U	U
<b>Change in habitat</b>	direct/ indirect	n/a	n/a	n/a	n/a	I	I	U	I	U
	cumulative	n/a	n/a	n/a	n/a	U	U	U	U	U
<b>Change in genetic structure</b>	direct/ indirect	n/a	U	U	U	n/a	n/a	n/a	n/a	n/a
	cumulative	n/a	U	U	U	n/a	n/a	n/a	n/a	n/a

\*BSAI salmon includes Chinook salmon and other salmon

\*BSAI crab includes BSAI bairdi Tanner, BSAI opilio Tanner, BSAI red king and BSAI blue king

\*GOA crab includes GOA bairdi Tanner and GOA blue king

#### 4.4.3 Marine mammals direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2

The standard for determining significance for effects on marine mammals in the 2004 PSEIS was whether the impact would be expected to be detectable at the population level. Individual effects categories did not have to cause a measurable population decline or increase to be labeled significant, but data and/or plausible arguments must exist to determine that the action would have more than a negligible impact on the reproduction and/or survival of a species group in a way that could affect the population. The expected effects of each alternative were compared to the baseline conditions to determine the relative significance of the impacts of the alternatives on marine mammals.

**Table 5 Marine mammal species significance ratings in the 2004 PSEIS**

Effect		W Steller sea lion	E Steller sea lion	Northern fur seal	Harbor seal	Killer whale (transients)	Other pinnipeds*	Other toothed whales*	Baleen whales*	Sea otters
<b>Mortality (incidental take, entanglement)</b>	direct/indirect									
	cumulative	S-				I / S- <sup>1</sup>			CS- <sup>2</sup> / I <sup>3</sup>	CS- / I <sup>5</sup>
<b>Prey availability</b>	direct/indirect						I / U <sup>4</sup>			
	cumulative	CS-		CS-	CS-					
<b>Spatial/temporal concentration of fisheries</b>	direct/indirect									
	cumulative	CS-		CS-	CS-					
<b>Disturbance</b>	direct/indirect									
	cumulative									

\*Baleen whales include blue whale, fin whale, sei whale, minke whale, humpback whale, gray whale, northern right whale, bowhead.

\*Other pinnipeds include Pacific walrus, spotted seal, bearded seal, ringed seal, ribbon seal, elephant seal

\*Other toothed whales include sperm whales, beaked whales, white sided dolphin, beluga whale, harbor porpoise, Dall's porpoise.

<sup>1</sup> -The exception to this finding is the AT1 transient group in Prince William Sound.

<sup>2</sup> -Fin, humpback and northern right whales;

<sup>3</sup> -Minke, gray, bowhead, sei, and blue whales

<sup>4</sup> -Northern elephant seals

<sup>5</sup> -Southcentral and southeast stocks of sea otters.

#### 4.4.4 Seabirds direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2

In the 2004 PSEIS, significance criteria for seabirds were based on whether the proposed action would have been likely to result in population level effects, defined as changes in the population trend outside the range of natural fluctuations. The projection model was used for predictions of fishing effort under the different FMP bookends, especially with respect to different gear types. The analysis also included other factors such as spatial/temporal restrictions and potential gear modifications for seabird avoidance. However, because there are a large number of unpredictable variables and gaps in our knowledge about particular species and ecosystem effects, it was impossible to ascertain significance on a strictly quantitative basis. Species were generally grouped according to the similarity of their response to the groundfish fishery and/or similarity in their management status. Conclusions are based on professional judgment of pertinent data and literature review.

Except for the supplemental food provided by the fisheries in the form of offal, the effects of the fisheries are all considered adverse to individual birds. Low levels of incidental take of seabirds are better for conservation purposes than high levels of take, but no amount of incidental take can be considered beneficial to a seabird population. The significance ratings for incidental take are, therefore, either insignificant or adverse. The same type of situation applies to fishery induced changes in benthic habitat

important to benthic-feeding seabirds, so there is no beneficial rating for this effect. Effects of the fishery on food availability could be adverse, insignificant, or beneficial. If there is a plausible mechanism and a reasonable set of conditions under which an effect may occur under a given FMP, the significance rating was labeled conditional. If there is a plausible mechanism for an effect, but not enough data to assess whether it occurs or whether the FMP would create the conditions under which it would occur, the significance rating was unknown.

**Table 6 Seabird species significance ratings in the 2004 PSEIS**

Effect		Short-tailed albatross	Other albatross*	Shearwaters*	Northern fulmar	Red-legged kittiwakes <sup>1</sup>	Murrelets <sup>1</sup>
<b>Mortality (incidental take)</b>	direct/ indirect						
	cumulative	CS-	S-	CS-		CS-	S-
<b>Availability of food</b>	direct/ indirect						
	cumulative					U	U
<b>Benthic habitat</b>	direct/ indirect	no effect	no effect	no effect	no effect	no effect	
	cumulative	no effect	no effect	no effect	no effect	no effect	

\*Other albatross include Laysan and blackfooted albatross

\*Shearwaters include sooty and shorttailed shearwaters

<sup>1</sup> Redlegged kittiwake, marbled murrelet, and Kittlitz's murrelet are species of management concern.

Effect		Other piscivorous species*	Other planktivorous species*	Steller's eiders	Spectacled eider
<b>Mortality (incidental take)</b>	direct/ indirect				no effect
	cumulative			S-	no effect
<b>Availability of food</b>	direct/ indirect				no effect
	cumulative				no effect
<b>Benthic habitat</b>	direct/ indirect		no effect		no effect
	cumulative		no effect	U	no effect

\*Other piscivorous species - alcids (except auklets), gulls, jaegers, terns, and cormorants

\*Other planktivorous species - auklets and stormpetrels

#### 4.4.5 Habitat direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2

The 2004 PSEIS considered adverse effects of fishing on benthic marine habitat from the perspective of ecosystem structure and function, as well as managed fish species. The potential effects of the groundfish fisheries on habitat that were used to compare the alternatives included mortality of, and damage to, living habitat, changes to benthic community diversity, and changes to the geographic diversity of impacts and protection. Specific impacts of groundfish fisheries on habitat are very difficult to predict. Evaluation of effects requires detailed information on the distribution and abundance of habitat types, the life history of living habitat, habitat recovery rates, and the natural disturbance regime. This information is generally incomplete.

**Table 7 Habitat significance ratings in the 2004 PSEIS**

Effect		Bering Sea		Aleutian Islands		Gulf of Alaska	
		PA.1	PA.2	PA.1	PA.2	PA.1	PA.2
<b>Changes to living habitat - direct mortality of benthic organisms</b>	direct/ indirect				S+		CS-
	cumulative	CS-	CS-/CS+	CS-	CS-/CS+	CS-	CS-/CS+
<b>Changes to benthic community structure</b>	direct/ indirect		CS+		S+		
	cumulative	CS-	CS-/CS+	CS-	CS-/CS+	CS-	CS-/CS+
<b>Changes in distribution of fishing effort - geographic diversity of impacts and protection</b>	direct/ indirect		S+		S+		
	cumulative	CS-	CS-/CS+	CS-	CS-/CS+	CS-	CS-/CS+

**4.4.6 Socioeconomics direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2**

In the socioeconomic impact analysis in the 2004 PSEIS, the term “significant” for an expected change in a quantitative indicator meant a 20 percent or more change (either plus or minus), relative to the comparative baseline. If the expected change was less than 20 percent, the change is not considered to be significant. The same threshold was used to roughly assess changes in qualitative indicators (e.g., fishing vessel safety). However, whereas changes in quantitative indicators were based on model projections, predicted changes in qualitative indicators were based on the judgment of the socioeconomic analysts.

**Table 8 Socioeconomic significance ratings in the 2004 PSEIS  
Harvesting and processing sectors**

Effect		Catcher vessels		Catcher processors		Inshore processors and motherships	
		PA.1	PA.2	PA.1	PA.2	PA.1	PA.2
<b>Groundfish landings by species group</b>	direct/ indirect	I/S+	I/S+/S-	I/S+	I/S+/S-	I/S+	I/S+/S-
	cumulative	I	I	I	I	I	I
<b>Groundfish ex-vessel value</b>	direct/ indirect	I	I/S-	n/a	n/a	n/a	n/a
	cumulative	I	I	n/a	n/a	n/a	n/a
<b>Groundfish gross product value</b>	direct/ indirect	n/a	n/a	I	I	I	I/S-
	cumulative	n/a	n/a	I	I	I	I
<b>Employment</b>	direct/ indirect	I	I	I	I	I	I
	cumulative	I	I	I	I	I	I
<b>Payments to labor</b>	direct/ indirect	I	I	I	I	I	I
	cumulative	I	I	I	I	I	I
<b>Product quality and product utilization rate</b>	direct/ indirect	n/a	n/a	CS+	CS-/S+	CS+	CS-/S+
	cumulative	n/a	n/a	CS+	S+/S-	CS+	S+/S-
<b>Excess capacity</b>	direct/ indirect	CS+	S+	CS+	S+	CS+	S+
	cumulative	CS+	S+	CS+	S+	CS+	S+
<b>Average costs</b>	direct/ indirect	CS+	CS+/S-	CS+	CS-/S+	CS+	CS-/S+
	cumulative	CS+	S+/S-	CS+	S+/S-	CS+	S+/S-
<b>Fishing vessel safety</b>	direct/ indirect	CS+	CS+/S-	CS+	CS-/S+	n/a	n/a
	cumulative	CS+	S+/S-	CS+	S+/S-	n/a	n/a

**BSAI and GOA regions**

Effect		Alaska Peninsula, Aleutian Islands		Kodiak Island		Southcentral Alaska		Southeast Alaska		Washington inland waters		Oregon coast	
		PA.1	PA.2	PA.1	PA.2	PA.1	PA.2	PA.1	PA.2	PA.1	PA.2	PA.1	PA.2
<b>In-region processing</b>	direct/ indirect	I	I	I	I	S+	I	I	S-	I	I	I	I
	cumulative	I/CS-	I	I	I	I	I	I	S-	I	I	I	I
<b>Regionally owned at-sea processors</b>	direct/ indirect	I	I	S+	I	S+	I	S+	I	I	I	I	I
	cumulative	I	I	I	I	I	I	I	I	I	I	I	I
<b>Extra-regional deliveries of regionally owned catcher vessels</b>	direct/ indirect	I	S-	I	I	I	I	I	S-	I	I	I	I
	cumulative	CS-	CS-	I	I	I	I	I	CS-	I	I	I	I
<b>In-regional deliveries of regionally owned catcher vessels</b>	direct/ indirect	I	S-	I	I	S+	I	I	S-	I	I	I	I
	cumulative	CS-	CS-	I	I	I	I	I	CS-	I	I	I	I
<b>Total direct, indirect, and induced labor income and full-time equivalents (FTEs)</b>	direct/ indirect	I	I	I	I	S+	I	I	S-	I	I	I	I
	cumulative	CS-	CS-	I	I	I	I	I	CS-	I	I	I	I

**Community Development Quota (CDQ) program, Subsistence, Environmental Justice, Market channels, Non-consumptive and non-use benefits**

	<b>Effect</b>		<b>PA.1</b>	<b>PA.2</b>
<b>CDQ program</b>	<b>Allocation of catch to CDQ groups, including potential revenue and potential funds available for approved economic development activities in CDQ communities</b>	direct/ indirect		
		cumulative		
<b>Subsistence</b>	<b>Subsistence use of groundfish</b>	direct/ indirect		
		cumulative		
	<b>Subsistence use of western Alaska salmon and bycatch</b>	direct/ indirect		
		cumulative		
	<b>Subsistence use of Steller sea lions</b>	direct/ indirect		
		cumulative		
	<b>Indirect subsistence use: income and joint</b>	direct/ indirect		
		cumulative		
<b>Environmental Justice</b>	<b>Alaska Peninsula and Aleutian Islands</b>	direct/ indirect		CS-
		cumulative		CS-
	<b>Kodiak Island</b>	direct/ indirect		
		cumulative		
	<b>Southcentral Alaska</b>	direct/ indirect		
		cumulative		
	<b>Southeast Alaska</b>	direct/ indirect		
		cumulative		
	<b>Washington inland waters</b>	direct/ indirect		
		cumulative		
	<b>Oregon coast</b>	direct/ indirect		
		cumulative		
<b>Market channels</b>	<b>Benefits to U.S. consumers</b>	direct/ indirect		
		cumulative		
<b>Non-consumptive and non-use benefits</b>	<b>Benefits derived from marine ecosystems and associated species</b>	direct/ indirect		S+
		cumulative		S+

**4.4.7 Ecosystem direct/indirect and cumulative effects significance ratings under Preferred Alternative PA.1 and PA.2**

Significance thresholds for determining the ecosystem-level impacts of fishing in the 2004 PSEIS involved both population-level thresholds that had already been established for species in the system (MSST for fish species; fishing-induced population impacts sufficient to lead to listing under the ESA, and fishing-induced impacts that prevent recovery of a species already listed under the ESA, for other species) and community- or ecosystem-level attributes that were outside of the range of natural variability for the system. These community or ecosystem-level attributes were more difficult to measure directly, and the range of natural variability of those attributes was not well known. We also lacked sufficient data on population status of some target or non-target species to determine whether they were above or below MSST or ESA-related thresholds. Thus, indicators of the strength of fishing impacts on the system were also used to evaluate the degree to which the preferred alternative might have a significant ecosystem impact.

For the preferred alternative FMP bookends, the possible impacts on (1) predator/prey relationships, including introduction of non-native species; (2) energy flow and redirection (through fishing removals and return of discards to the sea); and (3) diversity were addressed.

**Table 9 Ecosystem significance ratings in the 2004 PSEIS**

Effect		Ecosystem	
		PA.1	PA.2
<b>Change in pelagic forage availability</b>	direct/ indirect	I	I
	cumulative	CS-	CS-
<b>Spatial and temporal concentration of fishery impact on forage</b>	direct/ indirect	I	CS+ / I
	cumulative	CS-	CS-
<b>Removal of top predators</b>	direct/ indirect	I / U	I / U
	cumulative	CS-	CS-
<b>Introduction of non-native species</b>	direct/ indirect	I	I
	cumulative	CS-	CS-
<b>Energy removal</b>	direct/ indirect	I	I
	cumulative	I	I
<b>Energy redirection</b>	direct/ indirect	I	I
	cumulative	I	I
<b>Change in species diversity</b>	direct/ indirect	I / U	I / U
	cumulative	CS-	CS-
<b>Change in functional (trophic) diversity</b>	direct/ indirect	I	I
	cumulative	CS-	CS-
<b>Change in functional (structural habitat) diversity</b>	direct/ indirect	I	S+
	cumulative	CS-	CS+
<b>Change in genetic diversity</b>	direct/ indirect	I / U	I / U
	cumulative	I	I

## **5 Synthesis of Changes Since 2004**

### **5.1 Changes in the Management of Fisheries**

Since the adoption of the groundfish management policy in 2004, the Council has continued to make changes to its groundfish management program. The changes that have occurred to date can be witnessed in the FMP and regulatory amendments that have been implemented over this time period. Additionally, there have also been national changes affecting the groundfish management program. The Magnuson-Stevens Act was reauthorized in 2006, and contained provisions that have affected the groundfish management program to some extent (for example, annual catch limits and provisions governing the development of limited access privilege programs).

Table 10 lists the groundfish FMP amendments that have been implemented from 2004 to 2015, as well as those for which the Council has taken final action, but regulations are still being developed. The Council has recommended over 20 amendments to the BSAI FMP and GOA FMP since the adoption of its groundfish management policy in April 2004. Additionally, four BSAI and four GOA amendments had been adopted by the Council prior to April 2004, but had not yet been implemented when the PSEIS was written. Table 11 provides a synthesis of the major regulatory amendments that have been implemented during the same period. Between the two lists, the major changes in groundfish management are captured.

In addition, since the 2004 PSEIS, NMFS and the Council have prepared four comprehensive EISs that analyzed changes in the management of the fisheries. The Final Environmental Impact Statement for Essential Fish Habitat in Alaska (EFH EIS, NMFS 2005) evaluates alternatives and environmental consequences for three actions: (1) describing and identifying EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify Habitat Areas of Particular Concern within EFH, and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH. In 2010 NMFS and the Council conducted an EFH 5-Year Review that examined information within the 2005 EFH EIS and determined (1) new and more recent information exists to refine EFH for a small subset of managed species; (2) certain fishing effects may be impacting sensitive habitats of Bristol Bay red king crab, however additional analysis is needed; and (3) the non-fishing impacts analysis, including advisory EFH Conservation Recommendations, should be updated with the most current level of information.

The Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (Harvest Specifications EIS, NMFS 2007a) evaluated the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and BSAI management areas. The Harvest Specifications EIS evaluates the effects of different alternatives on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. Each year, NMFS prepares a SIR for that EIS to evaluate the need to prepare a supplemental EIS for the groundfish harvest specifications.

The Bering Sea Chinook Salmon Bycatch Management Final Environmental Impact Statement (Chinook EIS, NMFS 2009a) evaluated the Bering Sea pollock fishery and the effects of alternatives to minimize Chinook salmon bycatch to the extent practicable in that fishery.

The Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement (SSL EIS, NMFS 2014b) evaluates the environmental, social, and economic effects of alternatives to the Steller sea lion protection measures for the BSAI groundfish fisheries, in particular the Atka mackerel, Pacific cod, and pollock fisheries in the Aleutian Islands.

Finally, the Council also adopted, as Council policy, an ecosystem vision statement that applies to its fishery management as a whole, including the groundfish fisheries, in February 2014. The Council explicitly considered the relationship of the vision statement with the groundfish management policy, and found no inconsistency. The vision statement is included below:

### **Ecosystem Approach for the North Pacific Fishery Management Council**

#### ***Value Statement***

The Gulf of Alaska, Bering Sea, and Aleutian Islands are some of the most biologically productive and unique marine ecosystems in the world, supporting globally significant populations of marine mammals, seabirds, fish, and shellfish. This region produces over half the nation’s seafood and supports robust fishing communities, recreational fisheries, and a subsistence way of life. The Arctic ecosystem is a dynamic environment that is experiencing an unprecedented rate of loss of sea ice and other effects of climate change, resulting in elevated levels of risk and uncertainty. The North Pacific Fishery Management Council has an important stewardship responsibility for these resources, their productivity, and their sustainability for future generations.

#### ***Vision Statement***

The Council envisions sustainable fisheries that provide benefits for harvesters, processors, recreational and subsistence users, and fishing communities, which (1) are maintained by healthy, productive, biodiverse, resilient marine ecosystems that support a range of services; (2) support robust populations of marine species at all trophic levels, including marine mammals and seabirds; and (3) are managed using a precautionary, transparent, and inclusive process that allows for analyses of tradeoffs, accounts for changing conditions, and mitigates threats.

#### ***Implementation Strategy***

The Council intends that fishery management explicitly take into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species. Implementation will be responsive to changes in the ecosystem and our understanding of those dynamics, incorporate the best available science (including local and traditional knowledge), and engage scientists, managers, and the public.

The vision statement shall be given effect through all of the Council’s work, including long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management.

**Table 10 BSAI and GOA Groundfish FMP amendments since 2004**

<b>BSAI amd</b>	<b>GOA amd</b>	<b>Action</b>	<b>Date of Council action</b>	<b>Year of Implementation</b>
48	48	Revisions to the annual harvest specification process for groundfish	2003	2004
62	62	Single geographic location	2002	2009
	63	Move skates to the target species category	2003	2004
65	65	Identify habitat areas of particular concern, and harvest control measures	2005	2006
	67	Individual Fishing Quota (IFQ) – allow category B quota share to be fished on a vessel of any length, in any area	2005	2007
	68	Rockfish pilot program	2005	2006

BSAI amd	GOA amd	Action	Date of Council action	Year of Implementation
	69	Change total allowable catch specification for the 'other species' category	2005	2006
71		CDQ – allow limited non-fishing investments, CDQ oversight, and 3-year allocation cycle ( <i>superseded by provisions of the revised Magnuson-Stevens Act</i> )	2002	N/A
73	77	Remove dark rockfish from the FMP	2007	2009
	72	Rescind retention requirements in shallow water flatfish fishery	2003	2008
78	73	Revise essential fish habitat descriptions, harvest control measures	2005	2006
79		Groundfish retention standard (suspended as of 2011)	2003	2008
80		Sector allocation and cooperative for head and gut groundfish catcher processors	2007	2007
81	74	Revised management policy	2004	2004
82		Allocation of Aleutian Islands pollock total allowable catch to the Aleut Corporation	2004	2005
83	75	Housekeeping updates to the FMP	2004	2005
84		Exempt certain vessels from salmon bycatch savings area closures	2005	2007
85		Pacific cod sector allocations	2006	2008
86	76	Observer program restructuring	2010	2012
87		CDQ eligibility ( <i>superseded by provisions of the revised Magnuson-Stevens Act</i> )	2006	N/A
88		Aleutian Islands Habitat Conservation Area boundary adjustment	2007	2008
89		Bering Sea habitat conservation measures	2007	2008
90	78	Allow post-delivery transfers for Amendment 80 cooperatives (BSAI 90) and rockfish program (GOA 78)	2007	2009
91		Revise PSC limit for salmon bycatch, rescind savings areas	2009	2010
	79	Set allowable biological catch and overfishing level specifications for the "other species" category	2008	2008
92	82	Rescind latent trawl gear licenses	2008	2009
93		Modify rules for Amendment 80 cooperative formation	2010	2011
94		Require gear modification to trawl sweeps for nonpelagic trawl vessels targeting flatfish	2009	2010
	83	Pacific cod sector allocations	2009	2012
	85	Remove BSAI stand down provision for catcher processors participating in rockfish pilot program	2008	2009
	86	Add a Pacific cod fixed gear endorsement to GOA licenses	2009	2011
95		Move skates from the other species to the target species category	2010	2010
96	87	Revise FMP species to fit either in target or ecosystem component categories, describe current practice for setting annual catch limits and using accountability measures	2010	2010
97		Allow vessel replacement for Amendment 80 vessels	2010	2012
	88	Central GOA Rockfish Program: allocate exclusive harvest privileges to trawl vessels for Pacific ocean perch, pelagic shelf rockfish, and northern rockfish	2010	2011
	89	Establish area closures around Kodiak for GOA Tanner crab protection, require trawl sweep modification for GOA flatfish	2010	2014

<b>BSAI amd</b>	<b>GOA amd</b>	<b>Action</b>	<b>Date of Council action</b>	<b>Year of Implementation</b>
		fisheries		
98	90	Update EFH descriptions and associated information, and impacts of non-fishing activities on EFH, and extend timing of HAPC process to correlate with the EFH 5-year review	2011	2012
99		Change the freezer longline maximum length overall on License Limitation Program (LLP) licenses	2012	2014
100	91	Add an ecosystem component category for grenadiers to the FMP	2014	2014
	93	Establish PSC limits for Chinook salmon in the Central/Western GOA pollock fisheries, and require full retention of salmon	2011	2012
	94	Revise the vessel use caps applicable to sablefish quota share held by GOA Community Quota Entities (CQE) and add three eligible communities to the CQE Program	2011	2013
	95	Establish PSC limits for Pacific halibut in the Gulf of Alaska	2012	2014
102		CQE program in Area 4B and Area 4B "fish up"	2012	2014
103		Prohibit Pacific cod fishing in Pribilof Islands Habitat Conservation Zone	2010	2014
	96	Provide ability for CQE to buy small blocks of halibut QS	2013	2014
	97	Chinook PSC management measures for non-pollock trawl fisheries	2013	2014
104		Establish habitat areas of particular concern (HAPC) skate sites	2013	2015
105		Provide flexibility for flatfish specifications	2013	2014
106		Allow replacement of AFA vessels	2013	2014
107		Establish transit areas through walrus protection areas at Round Island and Cape Peirce	2014	2015
108	100	Correction on vessel length restriction for small vessel LLP license	2014	2015
109		Allow for small boat CDQ Pacific cod fishery	2015	
110		Chinook and chum salmon PSC limit measures	2015	
	101	Allow use of longline pots for sablefish	2015	
111		Halibut PSC limit reductions	2015	
112	102	Observer coverage for small catcher processors	2015	
113		Aleutian Islands Pacific cod catcher vessel fishery and shoreplant delivery requirement	2015	

**Table 11 Major regulatory amendments for the BSAI and GOA groundfish fisheries since 2004**

Note: does not include regulations that implement FMP amendments, or are temporary, interim, corrections or clarifications

Subject	Action	Year of Implementation
Harvest specifications	2004 BSAI and GOA harvest specifications	2004
	2005-2006 BSAI and GOA harvest specifications	2005
	2006-2007 BSAI and GOA harvest specifications	2006
	2007-2008 BSAI and GOA harvest specifications	2007
	2008-2009 BSAI and GOA harvest specifications	2008
	2009-2010 BSAI and GOA harvest specifications	2009
	2010-2011 BSAI and GOA harvest specifications	2010
	2011-2012 BSAI and GOA harvest specifications	2011
	2012-2013 BSAI and GOA harvest specifications	2012
	2013-2014 BSAI and GOA harvest specifications	2013
	2014-2015 BSAI and GOA harvest specifications	2014
	2015-2016 BSAI and GOA harvest specifications	2015
Catch restrictions	remove a harvest restriction on the HLA Atka mackerel fishery in the Aleutian Islands	2004
	full retention of demersal shelf rockfish and donation rules	2004
	allow processors to use the offal from halibut and salmon intended for the prohibited species donation program for commercial products (fish meal)	2004
	adjust the maximum retainable allowance (MRA) enforcement period for BSAI pollock from enforcement at any time during a fishing trip, to enforcement at the time of offload	2004
	revise the MRAs for groundfish in the GOA arrowtooth flounder fishery	2009
	repeal groundfish vessel incentive program	2008
	GOA pollock trip limits	2009
	revise the MRAs for groundfish in the BSAI arrowtooth and Kamchatka flounder fishery	2013
	remove groundfish retention standard requirements	2013
	BSAI fixed gear parallel fishery management measures	2012
Bering Sea AFA pollock fishery	remove the expiration date of regulations implementing the AFA	2004
CDQ	simplify the processes for making quota transfers, for authorizing vessels as eligible to participate in the CDQ fisheries, and for obtaining approval of alternative fishing plans	2005
	Revise CDQ regulations for recordkeeping, vessel licensing, catch retention requirements, and fisheries observer requirements to ensure that they are no more restrictive than regulations in effect for comparable non-CDQ fisheries managed under individual fishing quotas or cooperative allocations	2012

<b>Subject</b>	<b>Action</b>	<b>Year of Implementation</b>
BSAI and GOA IFQ sablefish fishery	allow quota shareholders in 4C to fish in either 4C or 4D	2005
	IFQ cost recovery fee reform	2006
	exclude tagged halibut and sablefish catches from IFQ account deduction	2006
	allow transfers of quota share for medical reasons; require VMS for vessels harvesting sablefish in the BSAI; allow category B catcher vessel quota share for Southeast Outside District sablefish to be fished on catcher vessels of any length	2007
	allow processing of non-IFQ species on a vessel with B, C, or D shares onboard	2008
	allow longline pot gear in Bering Sea during June, allow mobilized military personnel to make temporary IFQ transfers	2008
	IFQ online access to IFQ account information	2008
	Allow longline pot gear in Southeast GOA	2015
GOA rockfish program	revise central GOA rockfish fisheries program monitoring and enforcement provisions	2007
	extension of central GOA rockfish program under MSA	2008
seabirds	revise seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce incidental catch of the short-tailed albatross and other seabird species	2004
	revise seabird avoidance measures to strengthen gear standards for small vessels and eliminate certain unnecessary requirements	2008
	eliminate seabird avoidance requirements for vessels less than or equal to 55 ft LOA in 4E	2009
Marine mammals	revise SSL protection measures for the GOA pollock and Pacific cod fishing closure areas near four SSL haul outs and modify the seasonal management of pollock harvest in the GOA	2005
	Revise SSL protection measures for the Aleutian Islands Atka mackerel and Pacific cod fisheries	2010
	Designate critical habitat for the Cook Inlet beluga whale	2011
	Revise SSL protection measures for the Aleutian Islands Atka mackerel, Pacific cod, and pollock fisheries	2014
Research areas	reopen the Cape Sarichef Research Restriction Area in the BSAI to directed fishing for groundfish	2006
	close Chiniak Gully Research Area to all commercial trawl fishing from August 1 to September 20, 2006-2010	2006
Observer program	provide flexibility in the deployment of observers	2004
	electronic reporting for vessels – ATLAS (at-sea observer communication system requirements)	2004
	technical amendment extending the North Pacific observer program beyond 2002	2004
	revise requirements facilitating observer data transmission and improve support for observers (ATLAS 2)	2006
	observer sunset date removal	2007
	Improve operational efficiency of the Observer Program and collected data	2010

Subject	Action	Year of Implementation
reporting requirements	make effective the collection of information under the AFA amendments	2004
	exempt groundfish catcher processors and motherships with operational VMS from check-in check-out requirements	2008
	implement new electronic groundfish catch reporting system, the Interagency Electronic Reporting System (IERS), and its data entry component, eLandings	2009
	exempt vessels using dinglebar gear from the requirement to use VMS	2009
	Miscellaneous recordkeeping and reporting revisions, incl to e-Landings	2008
	BS Chinook salmon bycatch economic data collection for the Bering Sea pollock fishery	2012
	Modify equipment and operational requirements for freezer longliners named on License Limitation Program licenses endorsed to catch and process Pacific cod at sea with hook-and-line gear in the BSAI	2012
	GOA trawl economic data collection	2014
	Revise the at-sea scales program for catcher/processors and motherships that are required to weigh catch at sea.	2014
	Codify type-approval standards, requirements, procedures, and responsibilities applicable to VMS products and services.	2015

## 5.2 Management changes as they pertain to the Council’s policy goals

The following section evaluates the Council’s management actions since the completion of the 2004 PSEIS in 2004. The Council’s groundfish policy (the approved, preferred alternative from the 2004 PSEIS) is structured with nine goal statements, each supported by specific objectives, see Appendix 1. For each goal statement and set of objectives, we identify the relevant FMP and regulatory amendments implemented over the last ten years, as well as other management steps that the Council has taken with respect to these goals. The discussion in this section is not necessarily comprehensive, as each amendment may satisfy many of the Council’s goals and objectives. Rather, it is intended to provide an overview of the major management changes of the last eleven years, and how they compare to the management objectives that the Council set for itself in 2004.

Additionally, we have also looked back to the example FMPs that illustrated the preferred alternative analyzed in the 2004 PSEIS. Given the Council’s actions of the last ten years, the current groundfish management program does now fall within the range of example FMPs that were analyzed in the PSEIS.

Each of the sections below identifies one of the Council’s policy goals. The specific objectives, sometimes abbreviated, linking to that policy goal are listed after each policy goal. If the objectives are also linked to a specific item on the Council’s workplan,<sup>35</sup> that is noted also. After each policy goal and objectives are listed the FMP amendments related to this goal statement, the regulatory amendments related to this goal statement, and other management actions related to this goal statement.

<sup>35</sup> The Council developed a workplan to track the implementation of the various management objectives over time and prioritize issues for consideration. The workplan was developed in June 2004 revised in February 2007. The Council is updated on the status of this workplan at each meeting.

## **Prevent Overfishing**

1. Adopt conservative harvest levels
2. Use existing OY caps
3. Specify OY as a range
4. Periodic reviews of  $F_{40\%}$  and adopt improvements
5. Improve management through species categories (on workplan)

### FMP amendments related to this goal statement

- revisions to the harvest specifications process (B48/G48)
- moved skates to target category (G63)
- biologically-based specifications for GOA “other species” category (G69, G79)
- amendments to bring FMPs in line with annual catch limit requirements, including moving other species into target category, and creating an ecosystem component category (B95, G87)
- amendment to include grenadiers in the ecosystem component of the FMPs (B100, G91)
- Restructured observer program reduces bias in catch accounting (B86, G76)
- Provide flexibility for flatfish specifications (B105)

### Regulatory amendments related to this goal statement

- Annual specifications for setting harvest levels

### Other management actions related to this goal statement

- Regular Center for International Experts reviews for stock assessments and harvest strategies
- Ongoing work on accounting for uncertainty in control rules
- Council policy and ongoing discussion of spatial management for stocks

## **Promote Sustainable Fisheries and Communities**

6. Promote conservation while providing for OY
7. Promote management measures that avoid social and economic disruption
8. Promote fair and equitable allocation
9. Promote safety

These considerations are applied to all management actions.

## **Preserve Food Web**

10. Develop indices of ecosystem health (on workplan)
11. Improve ABC calculations to account for uncertainty and ecosystem
12. Limit harvest on forage species
13. Incorporate ecosystem considerations in fishery management

### Other management actions related to this goal statement

- Uncertainty and ecosystem considerations taken into account during stock assessment and harvest specifications
- Ecosystem indices reported and assessed in annual ecosystem SAFE report
- Adoption of the Aleutian Islands Fishery Ecosystem Plan, and development of a Bering Sea Fishery Ecosystem Plan
- Development of ecosystem synthesis reports for the Bering Sea and the Aleutian Islands ecosystem areas, and ongoing development of report for the Gulf of Alaska
- Adoption, as Council policy, of an ecosystem vision statement

## **Manage Incidental Catch and Reduce Bycatch and Waste**

14. Continue and improve current incidental catch and bycatch program (on workplan)
15. Develop incentive programs for bycatch reduction (on workplan)
16. Encourage research for non-target species population estimates (on workplan)
17. Develop management measures that encourage techniques to reduce bycatch (on workplan)
18. Continue to manage incidental catch and bycatch through seasons and areas
19. Account for bycatch mortality in TAC accounting (on workplan)
20. Control prohibited species bycatch through PSC limits (on workplan)
21. Reduce waste to biologically and socially acceptable levels

### FMP amendments related to this goal statement

- Groundfish retention standard (B79, subsequently removed)
- Bering Sea Chinook salmon bycatch restrictions (B84, B91)
- Trawl sweep elevation requirement in the flatfish fisheries (B94, G89)
- GOA area closures to reduce bairdi crab bycatch (G89)
- Establishment of PSC limits for Chinook salmon in the GOA trawl pollock and non-pollock fisheries (G93, G97)
- Reduce PSC limits for GOA halibut (G95)
- Restructured observer program reduces bias in bycatch accounting (B86, G76)
- Prohibit Pacific cod fishing in Pribilof Islands Habitat Conservation Zone (B103)
- BSAI Chinook and chum salmon PSC avoidance measures (B110 *approved by Council, not yet implemented*)
- Reduce PSC limits for BSAI halibut (B111 *approved by Council, not yet implemented*)

### Regulatory amendments related to this goal statement

- Annual specifications for setting prohibited species limits
- Revisions to MRAs
- Revision to regulations for prohibited species donation program and fishmeal

### Other management actions related to this goal statement

- Upcoming discussion paper on BSAI crab bycatch
- Council encourages research through annual research priorities
- NMFS and observer program work on improving statistical methods for bycatch accounting (as part of National Bycatch Report initiative)
- Development of a halibut management framework

## **Avoid Impacts to Seabirds and Marine Mammals**

22. Continue to protect ESA-listed and other seabirds
23. Maintain or adjust SSL protection measures (on workplan)
24. Encourage review of marine mammal and fishery interactions
25. Continue to protect ESA-listed and other marine mammals (on workplan)

#### FMP amendments related to this goal statement

- Walrus protection areas around Round Island and Cape Pierce, including transit corridors for Federal fishing vessels (B107)

#### Regulatory amendments related to this goal statement

- Revisions to seabird avoidance measures, including in Area 4E
- Revisions to Steller sea lion closures for pollock and cod fisheries in the GOA
- Revisions to Steller sea lion protection measures for Atka mackerel, Pacific cod, and pollock fisheries in the Aleutian Islands
- Designation of critical habitat for Cook Inlet beluga whale

#### Other management actions related to this goal statement

- ESA consultations on fishery impacts on listed seabirds and marine mammals
- Council receives protected species report at each meeting, monitoring issues with seabirds and marine mammals
- Reconsideration of Steller sea lion closures in 2014 biological opinion and 2014 EIS

### **Reduce and Avoid Impacts to Habitat**

26. Review and evaluate efficacy of habitat protection measures for managed species (on workplan)
27. Identify EFH and HAPC, and mitigate fishery impacts as necessary (on workplan)
28. Develop MPA policy
29. Encourage research on baseline habitat mapping (on workplan)
30. Develop goals and criteria for MPAs; implement as appropriate (on workplan)

#### FMP amendments related to this goal statement

- HAPC (B65/G65) and EFH (B78/G73) amendments, and associated fishery area closures in the GOA and Aleutian Islands (AI)
- Bering Sea Habitat Conservation (B89) with area closures for non-pelagic trawling
- Trawl sweep elevation requirement in the flatfish fisheries (B94, G89)
- Update to EFH information with findings from the 2010 EFH 5-year review (B98/G90)
- Designation of skate nurseries in Bering Sea as HAPC (B104)

#### Other management actions related to this goal statement

- Discussion of protected areas for Bering Sea canyons
- Discussion paper resulting from EFH 5-year review to look at groundfish impacts on crab EFH (especially red king crab in southwestern Bristol Bay)
- Ongoing 2015 EFH 5-year review, including updates to fishing effects model and EFH descriptions
- Discussion of a Northern Bering Sea Research Area Research Plan (subsequently tabled)
- Council discussion regarding nominating Alaska MPAs to national MPA center register (tabled)
- Council encourages research through annual research priorities

### **Promote Equitable and Efficient Use of Fishery Resources**

31. Provide economic and community stability through fair allocation
32. Maintain LLP and initiate rights-based management programs (on workplan)
33. Periodically evaluate effectiveness of rights-based management programs
34. Consider efficiency when adopting management measures (on workplan)

#### FMP amendments related to this goal statement

- Sector allocations for Pacific cod (B85, G83); fixed gear endorsement in GOA (G86)
- Sector allocations and cooperative formation for 3 flatfish species, POP, and Atka mackerel in BSAI (Amendment 80); vessel replacement and cooperative revisions (B80, B90, B93, B97)
- Latent licenses rescinded (B92/82, G86)
- Cooperative program for rockfish in central GOA (G68); program revisions (G78, G85); new program authorized (G88)
- BSAI freezer longline maximum length overall adjustment (B99)
- AI pollock to the Aleut Corporation (B82); Single geographic location amended for pollock motherships (B62, G62); AFA vessel replacement (B106)
- IRIU rescinded in GOA for shallow water flatfish (G72)
- IFQ B quota shareholders can fish on any size vessel (G67), “fish up” in Area 4B (B102)
- Revisions to GOA CQE program entities, revise vessel use caps, allow purchase of small blocks, establish CQE program in Area 4B (G94, G96, B102)
- Allow for a small boat CDQ Pacific cod fishery (B109, *approved by Council but not yet implemented*)
- Allow use of longline pots for sablefish (G101, *approved by Council but not yet implemented*)
- Aleutian Islands Pacific cod catcher vessel fishery and shoreplant delivery requirement (B113, *approved by Council but not yet implemented*)

#### Regulatory amendments related to this goal statement

- Modify monitoring and reporting requirements for BSAI cod freezer longliners
- BSAI fixed gear parallel fishery management measures
- Minor revisions to AFA, CDQ, IFQ, Rockfish Programs
- GOA pollock trip limits

#### Other management actions related to this goal statement

- Permit fee authorization (all FMPs)

### **Increase Alaska Native Consultation**

35. Incorporate local and traditional knowledge into fishery management
36. Consider ways to enhance local and traditional knowledge collection
37. Increase Alaska Native participation in fishery management (on workplan)

#### FMP amendments related to this goal statement

- AI pollock to the Aleut Corporation (B82)
- Revisions to GOA CQE program eligible entities, revise vessel use caps, allow purchase of small blocks, establish CQE program in Area 4B (G94, G96, B102)
- Allow for a small boat CDQ Pacific cod fishery (B109, *approved by Council but not yet implemented*)
- Aleutian Islands Pacific cod catcher vessel fishery and shoreplant delivery requirement (B113, *approved by Council but not yet implemented*)

#### Other management actions related to this goal statement

- Community outreach and consultation policy adopted by Council in 2008
- Community committee helps prioritize outreach (currently focused on BSAI salmon analyses)
- Website redesigned to include a rural outreach component

## **Improve Data Quality, Monitoring, and Enforcement**

38. Increase utility of observer data (on workplan)
39. Develop equitable funding mechanisms for the NPGOP (on workplan)
40. Increase economic data reporting requirements (on workplan)
41. Improve technology for monitoring and enforcement (on workplan)
42. Encourage development of an ecosystem monitoring program
43. Cooperate with NPRB to identify needed research
44. Promote enforceability
45. Coordinate management and enforcement programs with Federal, State, international, and local partners

### FMP amendments related to this goal statement

- Observer program restructuring (B86/G76)
- Remove dark rockfish from FMP, allow management by State of Alaska (B73/G77)
- Change observer coverage category exemptions for small catcher processors (B112/G102, *approved by Council but not yet implemented*)

### Regulatory amendments related to this goal statement

- Electronic reporting, online accounting
- Changes to VMS requirements (required for sablefish in BS, no longer required for dinglebar lingcod in GOA)
- Repeal of vessel incentive program
- Changes to observer program to provide flexibility in deployment and improve operational efficiency
- Bering Sea Chinook salmon bycatch economic data collection
- GOA trawl economic data collection

### Other management actions related to this goal statement

- Annual refinement of observer data through the deployment plan
- Ongoing work to improve Catch Accounting System
- Discussion paper on VMS use and requirements
- Electronic monitoring is being developed as a tool for catch monitoring. Pre-implementation program approved for 2016.
- Council encourages research through annual research priorities, cooperates with North Pacific Research Board
- Council initiated and participates in Alaska Marine Ecosystem Forum, as well as maintaining other relationships with partner entities

## **5.3 Changes in groundfish and environmental conditions**

The following is a brief summary of Council documents that evaluate groundfish and environmental conditions.

### **Groundfish SAFE reports**

The Council's annual Groundfish Stock Assessment and Fishery Evaluation (SAFE) report provides a detailed analysis of the status of groundfish stocks each year. No groundfish species is currently, nor has been, overfished or subject to overfishing, since the analysis that was conducted in the 2004 PSEIS.

## **Ecosystem Assessments in the annual Groundfish SAFE report**

The AFSC prepares an Ecosystem Considerations appendix to the annual SAFE reports (Zador 2014) that provides a comprehensive overview of environmental conditions in the BSAI and GOA on an annual basis. The appendix includes an ecosystem assessment for the Bering Sea, Aleutian Islands, and Gulf of Alaska, as well as various data series that are ecosystem status and management indicators.

The AFSC staff has developed a format for reporting various indices over time, and comparing the most recent five years against the historical record for each indicator. The first section of the Ecosystem Considerations appendix includes abbreviated report cards for the Eastern Bering Sea and the Aleutian Islands (a report card for the GOA is being prepared), as well as an executive summary of recent trends. The report shows climate indices for the North Pacific, including the Pacific Decadal and Arctic Oscillations, and eastern Bering Sea ice retreat and cold pool volume indices. All of these are within one standard deviation of the historical mean for the data set. The report also shows ecosystem indices for the groundfish fishery regions, and fishery indices for the Bering Sea, Gulf of Alaska, and Aleutian Islands. The 5-year mean is generally within one standard deviation of the historic mean.

### **2010 EFH 5-year review**

Additionally, the 2010 EFH 5-year review (NPFMC and NMFS 2010) evaluated changes in fishing impacts on habitat from the period analyzed in the EFH EIS (and incorporated by reference in the 2004 PSEIS) and the subsequent five-year period. Total trawl fishing effort decreased in all regions for pelagic and non-pelagic trawling, between the period analyzed in the EFH EIS (1998 to 2002) and the subsequent period (2003 to 2007). The report included figures plotting both the average fishing intensity, by five year period, as well as the difference in intensity between periods. The principal shifts in fishing intensity are summarized in the following paragraphs.

Bering Sea trawl: There has been no radical shift in the distribution of nonpelagic trawl fishing intensity in the Bering Sea from the period 1998 to 2002 to the period 2003 to 2007. The large area of the central Bering Sea that was subject to particularly high bottom trawl intensity in 1998 to 2002 received moderately lighter intensity from 2003 to 2007. Four principal areas were subject to increased bottom trawl intensity; (1) along the northwest border of the Pribilof Islands Habitat Conservation Zone, (2) off of Kuskoquim Bay, (3) along the southern border of the King Crab Protection Zone, and (4) western side of the Nushagak Peninsula (inner Bristol Bay). Most of the increases were moderate, though two of eight blocks in the fourth area along the western side of the Nushagak Peninsula (inner Bristol Bay) had strong increases. The area of high intensity effort north of Akutan Island, Unimak Pass and Unimak Island remained a high intensity area. Many of the shifts within that area registered as moderate or strong changes because of the high absolute levels of fishing intensity. The central Bering Sea showed a pattern of higher intensity in pelagic trawling around a central area of lower intensity near the border of management areas 509 and 513. Decreases in fishing intensity occurred on the west side of the Nushagak Peninsula, off of Kuskoquim Bay, northeast of St George Island, and Pervenets Canyon to the far northwest. Intensity dropped in the area north of Akutan Island, Unimak Pass, and Unimak Island, while there were increases on the southwest and eastern sides of that area.

Aleutian Islands trawl: There was a trend of decreases in bottom trawl fishing throughout the region, from the 1998 to 2002 period to the 2003 to 2007 period, with moderate decreases noted in the Adreanof Islands and Petrel Bank, as well as throughout the western portions of Rat Islands. Stronger increases in intensity occurred around Buldir Island and west of Tanaga, with moderate increases found in the Near Islands. Pelagic trawling in the Aleutian Islands decreased from 416 blocks fished in the first period, mainly on the 541/518 (Bering Sea) border, to only 16 blocks fished in the most recent period. Fishing intensity for pelagic trawl fisheries in the Aleutian Islands is currently very minor.

Gulf of Alaska trawl: Moderate decreases were seen in intensity of nonpelagic trawl fishing throughout the region, from the earlier (1998 to 2002) time period to the later (2003 to 2007), with overall blocks fished decreasing by approximately 40 percent. Largest drops in intensity occurred near Chiniak and south of Chirikof Island with moderate increases in intensity to the northwest of Chirikof Island and south of Ugak Island. Very minor changes in intensity were seen in pelagic trawling in the GOA, with moderate increases in Shelikof Strait, but decreases in intensity in most Kodiak nearshore waters, as well as in isolated areas of 610 and 620.

### **Aleutian Islands Fishery Ecosystem Plan**

In December 2007, the Council completed a Fishery Ecosystem Plan (FEP) for the Aleutian Islands ecosystem area. The FEP evaluates physical, biological, and socioeconomic relationships among ecosystem components, to identify areas of uncertainty and associated risk. Key ecosystem interactions, including climate and physical factors, predator-prey relationships, fishing effects, regulatory constraints, and socioeconomic (both fishing and non-fishing) activities occurring in the area are identified and associated with monitoring indicators. These indicators are tracked on an annual basis through the Aleutian Islands Ecosystem Assessment, in the Groundfish SAFE report.

## **6 Review of conclusions in the 2004 PSEIS**

This section summarizes the results from the expert team that reviewed the 2004 PSEIS conclusions. Each expert was asked to review the description of the impacts of the groundfish fisheries on his or her resource component (e.g., assessed species or species complex), based on new information that has become available since the PSEIS analysis was completed. The expert followed a template to consider whether management of or the status of the resource has changed, whether new information is available regarding the impacts of the fisheries on the resource, whether there are new methods of analysis or protocols for evaluating impacts. A copy of the template is included in Appendix 2 of the SIR. Based on these considerations, the expert was asked to conclude whether, based on information available at the time of the review, a new analysis using the latest methods and information would reach a seriously different conclusion.

The sections below synopsise the experts' review of the 2004 PSEIS conclusions. Each section begins with a summary table for the group of resource components, identifying the expert's conclusion and a short rationale. Additional points of rationale are captured in bullets following the summary table. The complete reviews for each resource component are included in Appendix 4 of the SIR. In some instances since the publishing of the draft SIR, and the completion of the reviews, staff have followed up with the expert reviewers to ensure that responses are consistent and complete across all respondents.

### **6.1 Target groundfish species**

Table 12 through Table 15 provide short summaries of the target groundfish species reviews,<sup>36</sup> with respect to whether a new analysis using the latest methods and information would reach a significantly different conclusion than is articulated in the 2004 PSEIS. The tables also provide a short statement of rationale for each species. The complete review for each species may be found in Appendix 4 to this SIR.

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<sup>36</sup> Note, in the BSAI FMP and GOA FMP there have been some changes of species names and species complexes since the 2004 PSEIS. A summary of these changes is included in Appendix 3 of this SIR.

**Table 12 Summary of expert review of round groundfish species**

Species	Would a new analysis reach a significantly different conclusion?		Comments / Rationale
	BSAI	GOA	
pollock	No	Possibly	<p><b>BSAI:</b> A difference with a new analysis would be the increased difficulty in adapting the technical interaction model to account for increased complexity in management and to predict outcomes of the TAC-setting process.</p> <p><b>GOA:</b> Groundfish fisheries and their management have been fairly stable since 2002, which inclines towards an assumption that the conclusions would be similar. There are two changes in the GOA ecosystem that may merit further evaluation, however: increase in abundance of arrowtooth flounder (predator of pollock); and a resurgence of large whales, in particular the humpback whale.</p>
Pacific cod	No	No	<p><b>BSAI:</b> In the future, analysis of the age-structured model for the Aleutian Islands stock, which is under development, will be informative.</p> <p><b>GOA:</b> The stock assessment applies current analytical methods and produces stable and biologically consistent estimates for characterizing the condition of the population.</p>
sablefish	No	No	<p><b>BSAI and GOA:</b> The stock assessment applies current analytical methods and produces stable and biologically consistent estimates for characterizing the condition of the population.</p>
Atka mackerel	No	No	<p><b>BSAI and GOA:</b> New and updated information for the BSAI, and limited new information for the GOA, have been incorporated into the stock assessment, but have not resulted in a different conclusion.</p>

**Pollock, Pacific cod, sablefish, and Atka mackerel**

- Management changes: ● There have been no changes to the harvest control rules for the stocks.  
 ● Some other management changes have affected the timing and/or distribution of the fisheries, including Chinook salmon PSC limits for the pollock fisheries, cod sector allocations, and Steller sea lion harvest restrictions.
- Status changes: ● Stocks are within the range of variability estimated in the 2004 PSEIS.
- New information on impacts: ● There have been changes in observer coverage requirements, resulting from the salmon bycatch measures in the Bering Sea, and observer restructuring.  
 ● Some added acoustic survey years have provided additional information
- New methods to assess impacts: ● Methods are being developed to explore the implications of incorporating stock-specific uncertainty buffers to establish ABCs.

**Table 13 Summary of expert review of flatfish species**

Species	Would a new analysis reach a significantly different conclusion?		Comments / Rationale
	BSAI	GOA	
yellowfin sole	No	<i>n/a</i>	<b>BSAI:</b> Some new information regarding temperature-dependent growth has become available, and is incorporated into the assessment, but it has not resulted in a different conclusion about the effect of the fishery on the resource.
greenland turbot	No	<i>n/a</i>	<b>BSAI:</b> The stock assessment applies current analytical methods and produces stable and biologically consistent estimates for characterizing the condition of the population.
arrowtooth flounder	No	No	<b>BSAI:</b> New information may change the estimate of arrowtooth flounder female spawning biomass, but would not change the PSEIS conclusions. <b>GOA:</b> Arrowtooth biomass is consistently increasing, as identified in the PSEIS.
Kamchatka flounder	No	<i>n/a</i>	<b>BSAI:</b> fishery-independent information is on the same order as before, and fisheries mortality remains at a moderate level.
northern and southern rock sole <sup>37</sup>	No	No	<b>BSAI:</b> some new information regarding temperature-dependent growth is available and will be incorporated in the assessment, but will not result in a different conclusion. <b>GOA:</b> The stock assessment applies current analytical methods and produces stable and biologically consistent estimates for characterizing the condition of the population. The status of stocks is within the range of variability of the 2004 PSEIS analysis.
flathead sole	No	No	<b>BSAI and GOA:</b> Qualitatively, the status of flathead sole has not changed since the 2004 PSEIS.
Alaska plaice	No	<i>n/a</i>	<b>BSAI:</b> The stock assessment applies current analytical methods, and Alaska plaice resource is high in abundance and lightly harvested.
shallow water flatfish	<i>n/a</i>	No	<b>GOA:</b> The majority of shallow water complex biomass is rock sole, for which an assessment model was developed in 2012. Other flatfish in the complex have been increasing or showing no trend in biomass since 2004.
deepwater flatfish	<i>n/a</i>	No	<b>GOA:</b> The deepwater flatfish complex is lightly exploited and current methods would reach similar conclusions.

<sup>37</sup> The BSAI assessment is limited to northern rock sole.

Species	Would a new analysis reach a significantly different conclusion?		Comments / Rationale
rex sole	<i>n/a</i>	No	<b>GOA:</b> Rex sole is lightly exploited and current methods would reach similar conclusions.
other flatfish	No	<i>n/a</i>	<b>BSAI:</b> The stock assessment applies current analytical methods, and Alaska plaice resource is lightly harvested, primarily as bycatch.

### Flatfish

- Management changes:
- Implementation of Amendment 80 in the BSAI has significantly changed the timing and utilization of flatfish fisheries.
- Status changes:
- Stocks are within the range of variability estimated in the 2004 PSEIS, with the exception of BSAI flathead sole, which has a larger biomass than previously estimated.
  - The Greenland turbot stock assessment was revised in 2012.
- New information on impacts:
- Trawl sweep modifications in the BS and GOA have reduced the fishery impact on the seafloor, and unobserved mortality of shellfish.
  - Observer restructuring has resulted in new observer information, particularly on small boats in the GOA.
- New methods to assess impacts:
- Some stocks are now being assessed in a higher tier, resulting in differences in the way the productivity of the stock and risk are incorporated into the ABC calculation.

**Table 14 Summary of expert review of rockfish species**

Species	Would a new analysis reach a significantly different conclusion?		Comments / Rationale
	BSAI	GOA	
Pacific ocean perch	No	No	<b>BSAI:</b> A sharp rise in biomass has occurred in recent years across all spatial subareas. In the future, work on the impact of disproportionate harvest on yield and biomass for stocks that exhibit spatial structure will be informative. <b>GOA:</b> The assessment uses the same assessment model as the 2004 PSEIS, and stock status is within the range of variability analyzed in that document.
northern rockfish	No	No	<b>BSAI:</b> Future work will be informative for northern rockfish, which exhibits stock structure at spatial scales smaller than our current management units, and which occasionally shows disproportionate harvesting patterns. <b>GOA:</b> The stock assessment applies current analytical methods, and the assessment model indicates that conclusions are still valid.
shortraker rockfish	No	No	<b>BSAI:</b> Shortraker rockfish exhibit spatial structure, and consistent disproportionate spatial harvesting would be expected to result in reductions of biomass and yield. Limited genetic samples currently exist for shortraker, however, to undertake spatial stock analysis. <b>GOA:</b> Stock status can still not be determined. The fishery is not open as a target fishery, and it is unlikely that a conservation concern has developed since the 2004 PSEIS.
blackspotted/ rougeye rockfish	No	Yes	<b>BSAI:</b> Future work will be informative for these species, which exhibit stock structure at spatial scales smaller than our current management units, disproportionate harvesting patterns and high subarea exploitation rates, and declines in subarea population abundance. <b>GOA:</b> There is now an age-structured stand-alone assessment for these stocks, so the impact of the fisheries on the resource can be better monitored. The impacts of the fishery on change in biomass can be changed from “unknown” to “insignificant.”
dusky rockfish	n/a	Yes	<b>GOA:</b> There is now an age-structured stand-alone assessment for dusky rockfish, so the impact of the fisheries on the resource can be better monitored. The impacts of the fishery on change in biomass can be changed from “unknown” to “insignificant”.
demersal shelf rockfish	n/a	No	<b>GOA:</b> The current analyses indicate that the conclusions of the 2004 PSEIS are still valid, however if demersal shelf rockfish are moved to a different tier status after review of a new model in 2014, then the category “change in biomass level” could change from “unknown” to a different rating.
thornyhead rockfish	n/a	Yes	<b>GOA:</b> Beginning in 2004, the thornyhead rockfish complex was downgraded to a Tier 5 species, primarily because of uncertainty in the validity of age readings for shortspine thornyhead. As a result, the conclusions of “insignificant” in the 2004 PSEIS should be changed to “unknown.” However, it is unlikely that a conservation concern has developed.
other rockfish	No	No	<b>BSAI:</b> Given the absence of new information, it is unlikely a new analysis would result in a different conclusion. <b>GOA:</b> Data for most “other rockfish” species is sparse. Since the fishery is not opened as a target fishery, it is unlikely that a conservation concern has developed since 2004.

## **Rockfish**

- Management changes: ● Implementations of Amendment 80 in the BSAI, and the rockfish programs in the Central GOA, have extended the timing of some rockfish fisheries.
- Status changes: ● Stocks are within the range of variability estimated in the 2004 PSEIS, except BSAI Pacific ocean perch, for which the estimated biomass has doubled since 2004.
- New information on impacts: ● There is new information about spatial structure for some rockfish species.  
 ● The use of pelagic trawl gear in the GOA rockfish fisheries has been increasing, reducing impacts of the fishery on habitat.  
 ● Bycatch estimates decreased for the majority of species in the Central GOA following the implementation of the rockfish program.
- New methods to assess impacts: ● Some stocks are now being assessed in a higher tier, resulting in differences in the way the status relative to stock size reference points are determined.  
 ● A template has been developed for evaluating the types of information to be considered when defining the spatial bounds of “stocks,” and which is in the process of being applied to many rockfish species.

**Table 15 Summary of expert review of squid, octopus, shark, sculpin, and skate species**

Species	Would a new analysis reach a significantly different conclusion?		Comments / Rationale
	BSAI	GOA	
squid	No	No	Some new information is available from the observer program, and a separate squid complex in the GOA will improve management, but these are not likely to result in a different conclusion.
octopus	No	No	Since the status of octopus is unknown, the effect of the fishery remains unknown.
sharks	No	No	The status of sharks remains unknown, and it is unlikely that a conservation concern has developed since 2004.
sculpins	No	No	Alternative methodologies have been explored in the assessment, but they do not result in significantly different conclusions.
skates	No	No	A new analysis could provide more detailed description of impacts, but would not reach a different conclusion.

### **Squid, octopus, sharks, sculpins, skates**

- Management changes:
- These species are now all managed as separate target species assemblages, rather than under the “other species” group.
- Status changes:
- Status remains unknown for most stocks within these complexes. Where more is known, there is estimates of abundance have not changed significantly since 2004.
- New information on impacts:
- Species-level identification within the complexes and recording of other biological information has improved.
  - For octopus, recent discard mortality information suggests that the impacts of the fishery on the resource have been overestimated.
  - Observer restructuring has resulted in improved coverage of fisheries that encounter some of these species.
- New methods to assess impacts:
- Assessments have been developed for some species within the complexes.
  - Development of ecosystem models has allowed greater exploration of how various ecosystem impacts might affect stocks and their predators.

## **6.2 Ecosystem component (prohibited and forage fish) and non-specified fish species**

Table 16 provides a short summary of the reviews for prohibited species, forage fish, and grenadiers. Additional points of rationale are captured in bullets following the summary table. The complete reviews for each resource component are included in Appendix 4.

**Table 16 Summary of expert review of prohibited species, forage fish, unspecified species**

Species	Would a new analysis reach a significantly different conclusion?	Comments / rationale
Pacific halibut	No	No new information concerning bycatch impacts is currently available. International Pacific Halibut Commission is investigating the relationship of bycatch mortality to long-term yield from the halibut resource. Bycatch of all sizes comprises a larger fraction of total mortality than in previous analyses, due to the decrease in total abundance of halibut since the 2004 PSEIS, and as a result the Council has analyzed and reduced halibut PSC limits in both the BSAI and the GOA.
Pacific salmon	Possibly	New stock origin information provides finer resolution to groundfish fishery impacts on Chinook salmon, highlighting that the stock composition of intercepted salmon in the BS and GOA trawl fisheries are very different, and providing a basis to analyze the impact of the BS pollock fishery on BS Chinook and chum salmon. The analysis, contained in the Chinook and chum salmon EA and other reports to the Council, shows very low impact of the fishery on aggregate returns.
Pacific herring	No	The 2004 PSEIS concluded that the groundfish fishery impacts on herring are insignificant. Mortality of herring in the BSAI is capped at 1% of biomass, and while BSAI herring biomass is currently known with considerably less certainty than 2004, it is still expected that the 1% limit will not adversely affect the population.
BSAI king crab	No	Abundance of king crab stocks has varied over the years, but the status of these stocks relative to the status determination criteria has not changed.
BSAI Snow crab	No	Since 2004, the snow crab stock has been declared rebuilt, based on a new assessment model. Stock assessment models have improved greatly, and crab bycatch is accounted for in the estimate of total catch used in stock assessment models.
BSAI Tanner crab	No	Effective status remains unchanged; however, the stock is no longer overfished. It remains at a relatively low abundance compared with historical levels. Stock assessment models have improved greatly, and crab bycatch is accounted for in the estimate of total catch used in stock assessment models.
GOA king and Tanner crab	No	The abundance of GOA crab stocks is similar to that reported in the 2004 PSEIS, and the prevailing conditions that likely drive these trends remain unchanged.
forage fish complex	No	Forage fishes continue to be caught only incidentally, and there is no new data to suggest that their status has changed.
grenadiers	No	Catch in the groundfish fisheries is low compared to estimated biomass of grenadiers.

### **Pacific halibut**

- Management changes:
- PSC limits for halibut in the GOA groundfish fisheries are being reduced over the 2014 to 2016 period.
  - PSC limits for halibut in the BSAI longline and trawl groundfish fisheries will be reduced with the approval and implementation of BSAI FMP Amendment 111, likely in 2016.
  - A limited access program for the charter fishery, and a catch sharing plan between the commercial and guided recreational harvesters, have been implemented in southeast and southcentral Alaska in 2014.
- Status changes:
- Current status is within the range of historic assessments, near the long-term average abundance for the stock, but has declined from historic high levels in the late 1990s.
- New information on impacts:
- Impacts of groundfish fisheries on the halibut resource are believed to have decreased since 2004, due to reductions in estimated halibut mortality in groundfish trawl fisheries (particularly in the BSAI Amendment 80 trawl fleet).
- New methods to assess impacts:
- The IPHC has conducted additional analyses of the impacts of trawl bycatch mortality on lost yield and spawning biomass for the halibut stock. This information was included in the NEPA analysis accompanying GOA FMP Amendment 95 (reducing halibut PSC limits in the GOA) and that accompanying BSAI Amendment 111. Beginning in 2013, observers are now deployed in small boat groundfish and halibut fisheries to assess halibut mortality and discards.

### **Pacific salmon or steelhead trout**

- Management changes:
- The Council and NMFS implemented new Chinook salmon PSC limits in the Bering Sea and the GOA, and requirements for incentive plan agreements to reduce Chinook and chum salmon encounters for Bering Sea pollock fishery participants.
- Status changes:
- Various Alaska Chinook salmon stocks have declined since 2004.
  - The annual run size of the chum salmon indicator species has varied significantly since 2004, but is generally trending back to 2004 levels in recent years.
- New information on impacts:
- New genetic stock composition analyses are available for the bycatch of Bering Sea Chinook and chum salmon, and GOA Chinook salmon, and more robust sampling protocols have been instituted.
- New methods to assess impacts:
- Impacts of Bering Sea Chinook and chum salmon bycatch relative to escapement and maturity have been completed and reported in the Chinook EIS and EA for Chinook and chum salmon PSC limit measures.

### **BSAI King Crab**

- Management changes:
- Management is essentially unchanged; however the implementation of BSAI Amendment 80 has changed fishing patterns and partitioned the red king crab PSC limit among fishery cooperatives.
  - A trawl sweep modification requirement was implemented in the BS flatfish fishery in 2011. Research has demonstrated that this reduces unobserved mortality of crab.
  - New overfishing definitions and total catch accounting were implemented for BSAI crab stocks in 2008, and annual catch limits have been set since 2011.
- Status changes:
- Abundance of king crab stocks has varied over the years, but the status of these stocks relative to the status determination criteria has not changed.
- New information on impacts:
- The implementation of Amendment 80 has reduced the rate of bycatch per target catch metric ton.
  - The Council is in the process of evaluating the historical bycatch of crab stocks by groundfish fisheries.
- New methods to assess impacts:
- Stock assessment models have improved greatly, and crab bycatch is accounted for in the estimate of total catch used in stock assessment models.

### **BSAI Snow Crab**

- Management changes:
- Management is essentially unchanged; however, the implementation of Amendment 80 has reduced the rate of snow crab bycatch per target catch metric ton.
- Status changes:
- Since 2004, the snow crab stock has been declared rebuilt, based on a new assessment model.
- New information on impacts:
- A trawl sweep modification requirement in the flatfish fishery was implemented in 2011. Research has demonstrated that this reduces unobserved mortality of crab.
- New methods to assess impacts:
- Stock assessment models have improved greatly, and crab bycatch is accounted for in the estimate of total catch used in stock assessment models.

### **BSAI Tanner Crab**

- Management changes:
- Management is essentially unchanged; however, the implementation of Amendment 80 has reduced the rate of Tanner crab bycatch per target catch metric ton.
- Status changes:
- Effective status remains unchanged, however the stock is no longer overfished. It remains at a relatively low abundance compared with historical levels.
- New information on impacts:
- A trawl sweep modification requirement in the flatfish fishery was implemented in 2011. Research has demonstrated that this reduces unobserved mortality of crab.
- New methods to assess impacts:
- Stock assessment models have improved greatly, and crab bycatch is accounted for in the estimate of total catch used in stock assessment models.

### **GOA Crab**

- Management changes:
- Management is essentially unchanged; however, the Council closed Marmot Bay to protect Tanner crab.
- Status changes:
- GOA red king crab remains at historically low levels and the Tanner crab stock continues to show high variability in recruitment. Little is known about golden or blue king crab. The prevailing conditions identified in the 2004 PSEIS that likely drive these trends remain unchanged.
- New information on impacts:
- The Council analyzed impacts of the GOA groundfish fisheries on Tanner crab in two NEPA analyses, and instituted a trawl-gear area closure and a trawl sweep modification requirement in the GOA flatfish fishery. Research has demonstrated that the sweep modification reduces unobserved mortality of crab.
  - Changes to observer coverage requirements may shed additional light on groundfish fishery interactions with crab in the future.
- New methods to assess impacts:
- No. There have been no changes to the state assessment methodology, and no regulatory changes to the harvest strategy or management structure.

### **Pacific herring**

- Management changes:
- Management of Pacific herring under the groundfish FMPs has not changed since 2004.
- Status changes:
- Due to reduced funding for herring surveys and the difficulties of surveying the region, very little is known about the status of Bering Sea herring populations other than the Togiak stock. Climate change and regime shifts are expected to have a direct effect on herring habitat, mortality, and prey, but the magnitude is unknown.
- New information on impacts:
- The impacts of groundfish fisheries on the herring resource are believed to be similar to what was analyzed in 2014. Most herring bycatch occurs in the Bering Sea pollock fishery.
- New methods to assess impacts:
- No new methods have been developed for evaluating the impacts of the groundfish fisheries on herring.

### **Forage fish**

- Management changes:
- No, although forage fish are now listed as part of the “ecosystem component” in the FMP.
- Status changes:
- There continues to be very little information on the status of forage fishes, including no reliable estimates of forage fish abundance.
- New information on impacts:
- More information is provided on a biennial basis as an appendix to the SAFE reports, including information on state-waters removals, and species’ vulnerability in the Pacific Northwest.
  - Available evidence suggests that forage fish abundance fluctuates independent of fishery activities.
- New methods to assess impacts:
- None.

## **Grenadiers**

- Management changes:
- Unofficial assessment reports have been prepared for grenadiers since 2006, and the FMPs were amended in 2014 to include grenadiers as an ecosystem component, which prompted increased data collection on grenadier catch in the groundfish fisheries.
- Status changes:
- The status of non-specified species was unknown in the 2004 PSEIS; grenadier assessment reports now track indices of abundance, which indicate that population trends are stable.
- New information on impacts:
- There is a disproportionate catch of females in surveys and the fishery; however, all data indicate that catch of grenadier has not affected the stock status.
  - Impacts of groundfish fisheries have decreased in recent years, since grenadiers are primarily caught in the sablefish longline fishery, and ABCs and TACs for sablefish have decreased.
  - New catch information is available from smaller vessels fishing for halibut, under the restructured observer program.
- New methods to assess impacts:
- In the assessment reports, catch, biomass, fishery and survey length frequencies, and indices of abundance are now tracked.

### **6.3 Marine Mammals and Seabirds**

Table 17 provides a short summary of the reviews for marine mammals and seabirds. Additional points of rationale are captured in bullets following the summary table. The complete reviews for each resource component are included in Appendix 4.

**Table 17 Summary of expert review of marine mammals and seabirds**

Species	Would a new analysis reach a significantly different conclusion?	Comments / rationale
Steller sea lions	No	Extensive new analysis of the impacts of the groundfish fisheries on SSLs was undertaken in the 2014 Biological Opinions (NMFS 2014a), and the 2014 SSL EIS (NMFS 2014b). These analyses, and the subsequent regulatory changes, result in fisheries that continue to avoid jeopardy and adverse modification of critical habitat, which is consistent with the conclusions in the PSEIS.
Northern fur seals	No	Ongoing research is evaluating whether there is evidence of a strong link between commercial fisheries and the decline of northern fur seals, but currently, the cause of the ongoing decline remains unknown.
Harbor seals	No	Continued paucity of information about the foraging ecology of this species, especially in the Aleutian Islands.
Ice-associated seals	No	An evaluation of newly available food habits data might identify further impacts from commercial fisheries, but firm conclusions would be difficult to develop with the limited information.
Northern elephant seals	No	The California breeding population appears to be continuing to grow.
Pacific walrus	No	The latest available estimate of Pacific walrus take is within the range analyzed in the PSEIS, and is considered insignificant.
Whales	Possibly	The ESA listing of Cook Inlet beluga whales and designation of critical habitat caused a new analysis of the impacts of the groundfish fisheries, but the conclusion was similar to that in the PSEIS. Also, fishery interactions with Bering Sea harbor porpoise, western North Pacific stock of humpback whales, western gray whales, and killer whales may have increased.
Sea otters	No	NMFS conducted a new analysis for the Biological Assessment (NMFS 2013) and arrived at a similar conclusion as the PSEIS.
Seabirds	No	Neither new information nor new approach to estimation will change the conclusions of the PSEIS that impacts are insignificant.

**Marine mammals – Steller sea lions**

- Management changes: ● Closures and restrictions on Atka mackerel, Pacific cod, and pollock fisheries in the Aleutian Islands, resulting from the 2014 Biological Opinion (NMFS 2014a) and 2014 SSL EIS (NMFS 2014b).
- Status changes: ● Abundance of SSLs has increased, and regionally, trends in population have changed.  
 ● New information available on food habits, abundance, foraging behavior, contaminants, and vital rates.  
 ● The eastern distinct population segment of SSL has been delisted.
- New information on impacts: ● 2014 Biological Opinion and 2014 EIS update changes in the impacts of groundfish fisheries on SSLs, especially in the AI.
- New methods to assess impacts: ● No, but more recent analyses using conventional methods have been undertaken.

### **Marine mammals – Northern fur seals**

- Management changes: ● None
- Status changes: ● Significant declines on both Pribilof Islands in the last 15 years, at just under 5 percent annually; partially offset by an increase in abundance on Bogoslof Island, where the population of pups now exceeds St George Island.
- New information on impacts: ● It is unknown if the fisheries are affecting northern fur seals, but there is additional published literature available indicating similar habitat and prey use by both consumers.
- New methods to assess impacts: ● No, but more recent analyses using conventional methods have been undertaken.

### **Marine mammals – Harbor seals**

- Management changes: ● None
- Status changes: ● Three previously-recognized stocks of harbor seals were subdivided into 12 stocks.  
● Harbor seals in Lake Iliamna have been petitioned for listing under the ESA.  
● Harbor seals in the Aleutian Islands have declined substantially since the early 1980s, especially in the western Aleutians; similar geographic pattern as SSLs.
- New information on impacts: ● Splitting into 12 stocks has led to individual stocks with lower abundance and the potential for groundfish fisheries to have significant impacts on individual stocks, but there is no new information.
- New methods to assess impacts: ● None

### **Marine mammals – Ice-associated seals**

- Management changes: ● None
- Status changes: ● In response to a petition for listing all four species under the ESA, NMFS listed ringed and bearded seals as threatened. NMFS is currently considering critical habitat designations.
- New information on impacts: ● The ESA status reviews identified food habits studies indicating that various species of groundfish are important to ribbon and bearded seals, in some areas, seasons, and/or years.
- New methods to assess impacts: ● None

### **Marine mammals – Northern elephant seals**

- Management changes: ● None
- Status changes: ● The California breeding population appears to be continuing to grow.
- New information on impacts: ● Unchanged since 2004; no recent reports of takes in Alaska fisheries.
- New methods to assess impacts: ● None

### **Marine mammals – Pacific walrus**

- Management changes: ● No adverse changes. New protection areas at Round Island and Cape Pierce have been implemented to minimize levels of disturbance from Federal vessels.
- Status changes: ● Walrus remains a candidate species for listing under the ESA. Uncertainty about current population estimates is very high.
- New information on impacts: ● Unchanged since 2004. Estimated take of walrus in the Alaskan fisheries is considered insignificant.
- New methods to assess impacts: ● None

### **Marine mammals – killer whale (transients), other toothed whales, baleen whales**

- Management changes: ● None
- Status changes: ● Killer whales: new information on transient killer whale counts. Resident stock continues to increase in population size, with exception of a few pods.  
● Toothed whales: Cook Inlet belugas have continued to decline, are now listed under the ESA, and have critical habitat designated through much of Cook Inlet. Bristol Bay belugas continue to increase in size. No new information on other toothed whales.  
● Baleen whales: North Pacific right whales are now relisted under the ESA, and critical habitat has been designated. Western Arctic bowhead population has been increasing. A large-scale study of humpback whales is being evaluated. The eastern N Pacific gray whale status remains the same; however, the western North Pacific population, once thought extinct, has been rediscovered. No new information on other baleen whales.
- New information on impacts: ● More specific information is now available on which target fishery is impacting which killer whale stocks.  
● One observed mortality of a harbor porpoise and one injury of a sperm whale, occurred in recent years due to groundfish fishery interactions. Also, the estimate of fisheries-related mortality to humpback whales is not significant. No other serious injuries or mortalities reported for other toothed or baleen whales, although information is lacking for belugas and western gray whales.
- New methods to assess impacts: ● None

### **Marine mammals – sea otters**

- Management changes:
- Yes – the southwest distinct population segment of the northern sea otter were listed as threatened under the ESA in 2005. Critical habitat was designated in nearshore marine waters.
- Status changes:
- Despite the listing of sea otters under the ESA, population abundance and trends have generally not notably changed since the early 2000s.
- New information on impacts:
- A 2006 ESA consultation concluded that groundfish fisheries are not likely to adversely affect sea otters. The consultation was reinitiated, with the same conclusion pronounced in 2013 (NMFS 2013).
- New methods to assess impacts:
- None

### **Seabirds**

- Management changes:
- Measures to manage seabird interactions with the fisheries are unchanged.
  - The 2013 implementation of restructured observer program will provide for better evaluation of total fishery impacts in the future.
- Status changes:
- Status of various seabird species groups remains unchanged.
- New information on impacts:
- Impacts reduced in the demersal longline fisheries.
  - Bycatch from trawl vessels higher than reported (estimates under evaluation), but still far less than the reduced impact in the longline fisheries.
  - Impact from vessels under 60 ft LOA are being evaluated with observer data beginning with 2013.
- New methods to assess impacts:
- Annual estimates of seabird bycatch from observer species composition now generated through the Catch Accounting System for longline vessels, and estimates being developed for similar procedure for trawl vessels

## **6.4 Habitat, Socioeconomics, Ecosystem**

Table 18 provides a short summary of the reviews for habitat, socioeconomics, and the ecosystem. Additional points of rationale are captured in bullets following the summary table. The complete reviews for each resource component are included in Appendix 4.

**Table 18 Summary of expert review of habitat, socioeconomics, and ecosystem components**

Species	Would a new analysis reach a significantly different conclusion?	Comments / rationale
Habitat	No	Analyses and research subsequent to the 2004 PSEIS have largely confirmed its general conclusions. A new analysis would provide more specific estimates with less uncertainty, but is not likely to reach seriously different conclusions.
Socioeconomics	No	The fundamental impacts of rationalizing fisheries (e.g., on overcapacity, efficiency, and the nature of the jobs) or closing areas to fishing is correct in the 2004 PSEIS. The 2004 PSEIS relies on predicting the results of rationalization programs, and a new analysis could provide actual results, likely with a smaller magnitude of benefits. But the basic understanding of effects is correct.
Ecosystem	No	The new research and information will enable improved monitoring of the ecosystem research, but to date does not suggest that the conclusions of the 2004 PSEIS would differ substantially.

**Habitat**

Management changes:
 

- Substantial changes to management have included implementation of regulations to protect habitat that provides structural relief, and gear modifications to limit adverse impacts of trawling on the seafloor.

Status changes:
 

- The current status of habitat is the same as in the PSEIS because long-lived, slow-growing species have likely not recovered from the impacts of historical fishing, and impacts continue in areas that are open to bottom trawling.
- In 2012, NMFS received a petition to list 44 species of cold water corals off Alaska as threatened or endangered in response to changing environmental conditions, the presence of commercial fisheries, and other factors. Based on the scientific information available, NMFS determined that such a designation was not warranted. NMFS analyzed whether threats are impeding the survival and recovery of coral species and warrant their protection under the ESA, including ocean warming, ocean acidification, commercial fishing, and oil spills (78 FR 10601, February 14, 2013). Coral species in Alaska are non-reef building and are less susceptible to the effects of ocean acidification as other organisms, and scientists noted that fishing closures in certain areas in the BSAI and GOA provide substantial protection for corals and cold water coral habitat.

New information on impacts:
 

- There has been additional research on the habitat requirements of different species, on trawl gear modifications to reduce habitat effects, and some limited research on the recovery of habitat in the eastern GOA that was damaged with trawl gear. There is improved resolution of data on the distribution of fishing effort due to broader implementation of VMS. There is also additional information on the distribution of habitat types and features, through better technology and habitat mapping.

New methods to assess impacts:
 

- The EFH EIS (NMFS 2005) used a different methodology than the PSEIS to assess the effects of fishing on habitat from the perspective of managed species that are dependent on habitat features. The 2005 EFH EIS fishing effects methodology is also being updated for the 2015 EFH 5-year review, which is

currently under development.

### **Ecosystem**

- Management changes:
- Management changes to protect ecosystem components are referenced in the sections above. The Council has adopted an ecosystem vision statement as a Council policy, and has established guidelines for including ecosystem considerations in stock assessment reports and analytical documents.
- Status changes:
- While there have been short-term changes in some ecosystem indicators, there is no evidence that these variations are outside short- or medium-term (3 to 5 year) range of natural variability, as measured over the last 30 years.
- New information on impacts:
- There has been substantial new world-wide research on energy flow within ecosystems; however, this information does not suggest that impacts of the groundfish fisheries on Alaska ecosystems have significantly changed.
- New methods to assess impacts:
- Significant improvements have been made in monitoring critical aspects of the ecosystem, through the development of annual Ecosystem Assessments and Report Cards, and management strategy evaluations on different ecosystem aspects. Ecosystems research at the AFSC is being developed as an Integrated Ecosystem Assessment program, which provides a formal method for evaluating climate impacts on Alaska's large marine ecosystems.

### **Socioeconomics**

- Management changes:
- The PSEIS refers to several fisheries that have since been rationalized, and there have also been management changes resulting from Chinook salmon bycatch avoidance and Steller sea lion protection measures.
- Status changes:
- The PSEIS projects many then-recent trends in species biomass, and the impacts of climate change, which have since changed.
- New information on impacts:
- Information is available on impacts in fisheries that have rationalized since the PSEIS, or been subject to other management changes (e.g., salmon or SSL closures). There are some impacts that the PSEIS does not address, but which have become issues of concern for the public and the Council, for example, the impacts of rationalization on crew members.
- New methods to assess impacts:
- A new economic impact model has been developed as part of the analysis of Steller sea lion closures, and several papers have been written on the impacts of rationalization programs.

## 7 Public Comments

This SIR was first released as a draft in April 2014 for public and Council review. The review process was to ensure that all the relevant facts and information are compiled in the SIR, as a basis for decision makers to reach a conclusion as to whether a supplemental PEIS is required. In response to public testimony at the April 2014 Council meeting, NMFS noted that the agency would consider public comments on the SIR before making their final determination. NMFS received public comment letters from the Center for Biological Diversity, The Boat Company, and Oceana. The comments from each have been paraphrased and similar comments have been grouped to avoid redundancy in the responses.

**Comment 1:** The individual NEPA analyses that have accompanied the numerous changes in management since 2004 are not an adequate substitute for a programmatic update. The SIR incorrectly characterizes these management changes as not substantial relative to environmental concerns and incorrectly concludes that the management changes are consistent with the 2004 PSEIS. The 2004 PSEIS should be updated to be consistent with the current management regime.

**Response:** Section 3 of the SIR recognizes that there have been a number of changes to the management program since issuance of the 2004 PSEIS and states, “All management changes since 2004 have been subject to NEPA analysis.” However, the Council and the agency did not simply rely on these NEPA analyses to conclude that a supplement to the 2004 PSEIS is not required at this time. The SIR clearly demonstrates that the Council and the agency comprehensively evaluated whether the management changes that have occurred since 2004 have resulted in a substantial change in the proposed action that is relevant to environmental concerns, as required by NEPA.

Section 5 of the SIR identifies the management changes that have occurred since 2004 and compares these changes with the proposed action of the 2004 PSEIS (i.e., the management of the Federal groundfish fisheries) and the preferred alternative for that action – adopt a conservative, precautionary approach to ecosystem-based fisheries management. Based on this information, the SSC, Council, and NMFS concluded that considerable progress has been made toward achieving the goals and objectives of the preferred alternative, and determined that the management measures implemented since 2004 are consistent with the preferred alternative. This information and analysis led the Council and NMFS to conclude that neither the management changes individually nor all of the management changes cumulatively since 2004 represent a substantial change in the proposed action.

As explained in Section 2.3 of this SIR, not every change requires the preparation of a supplement; only those changes that cause effects which are significantly different from those already studied require supplementary consideration. Therefore, in addition to determining whether a substantial change in the proposed action occurred, the SIR also examines whether any of the changes made since 2004 have caused effects that are significantly different than those analyzed and predicted in the 2004 PSEIS. This information is presented in Section 6 of the SIR and demonstrates that none of the management changes since 2004 have caused effects significantly different from those identified in the 2004 PSEIS.

**Comment 2:** Given the significant new information from recent scientific literature on ocean acidification and climate change, NMFS must supplement the 2004 PSEIS to consider the impacts of these changes on Alaska’s groundfish fisheries.

**Response:** EISs do not need to be supplemented because information has accumulated. Rather, a PSEIS should be supplemented if the information brings new bearing on the management of the groundfish fisheries or the impacts of the groundfish fisheries on the human environment. In the 2004 PSEIS, the expected direct, indirect, and cumulative impacts of the groundfish fisheries on the environment were assessed within a broad range of historical and future environmental conditions.

The 2004 PSEIS evaluates a groundfish management program that is both comprehensive and adaptive. The management program builds in the flexibility to adapt to changing environmental circumstances through a harvest specifications process that is based on the best available scientific information and responds to environmental variability. The groundfish policy objectives oblige the Council and NMFS to implement appropriate protection measures when resource components are adversely affected as a result of the groundfish fisheries.

This SIR considers whether recent information, about climate change or other topics, would cause analysts to reach significantly different conclusions about the impacts of the groundfish fisheries on the environment. The SIR finds that the conclusions characterized in the 2004 PSEIS are still appropriate, and that the trigger requiring a supplement to the 2004 PSEIS has not been met.

NOAA is a world leader in ocean acidification and climate change research and this scientific work in Alaska is available on the AFSC Web site at <http://www.afsc.noaa.gov/>.

**Comment 3:** The growing scientific understanding of cold water coral's important ecosystem role, the devastating impacts of bottom contact fisheries, and the resulting loss of important groundfish habitat, may support different conclusions about the impacts of bottom trawling and climate change than were considered in the 2004 PSEIS, and should be examined in a supplemental EIS.

**Response:** The 2004 PSEIS established the policy goal statement to reduce and avoid impacts to habitat. As a direct result, the Council and NMFS have implemented FMP amendments to identify and protect concentrations of deep sea coral and other living substrate from fishery impacts. The management policy will continue to guide the Council as it actively assesses any further protections needed for minimizing the impacts of fishing activities on deep sea coral. The habitat protection actions implemented under the management policy include establishing gear mitigation and coral protection areas in the Aleutian Islands and the GOA (BSAI/GOA Amendments 78/73; NMFS 2005), implementing habitat conservation areas in the BSAI (BSAI Amendment 89; NMFS 2007b), and requiring trawl gear modifications to reduce bottom contact (BSAI/GOA Amendments 94/89; NMFS 2009b/NMFS 2010). This SIR examined these changes in fishery management and concluded that these actions maintain and support the 2004 PSEIS's conclusions that the groundfish fishery has an insignificant impact on habitat, including corals.

The 2004 PSEIS also evaluated a more conservative policy alternative which, although not ultimately selected, took a more precautionary approach to uncertainty about the potential impact of the fisheries on bottom habitat. The conclusions of the 2004 PSEIS with respect to both the Preferred Alternative and other alternatives remain apposite with respect to the impacts of the groundfish fisheries on corals and groundfish habitat.

The 2004 PSEIS acknowledges the importance of coral and other living substrate, and assesses the impacts of bottom contact fisheries on habitat. New information exists regarding the impacts of the groundfish fisheries on habitat, including corals. The EFH EIS further analyzes the impacts of all groundfish fisheries, including bottom contact fisheries, on habitat, including cold water coral (NMFS 2005). NMFS analyzed whether threats are impeding the survival and recovery of coral species and warrant their protection under the ESA, including ocean warming, ocean acidification, commercial fishing, and oil spills (78 FR 10601, February 14, 2013). NMFS found that scientific or commercial information does not warrant protection under the ESA.

The Council has also initiated scientific research fieldwork and analysis of coral concentrations in the Bering Sea canyons (NMFS 2015). The management actions taken to protect cold water coral and

habitat are informed by ongoing scientific research conducted by the AFSC. For additional information, please see AFSC Web site at [http://www.afsc.noaa.gov/News/Aleutian\\_corals.htm](http://www.afsc.noaa.gov/News/Aleutian_corals.htm).

This SIR examined this new information and whether the groundfish fisheries are affecting habitat and corals differently than described in the 2004 PSEIS. Section 6 of this SIR summarizes the results of that analysis. No information indicates that the new analysis would conclude that there is now a significant impact where the 2004 PSEIS concludes that the impact was insignificant. Additionally, most of this new information has been analyzed in a subsequent NEPA or ESA analysis. Based on this work, the available new scientific information and research does not suggest a substantial change in our understanding of the impacts of the groundfish fisheries on the habitat in the BSAI and GOA.

**Comment 4:** New adverse effects to threatened or endangered species or new information about adverse effects require NMFS to supplement an EIS. NMFS must explore these adverse effects through a full SEIS at the programmatic level, to ensure that cumulative impacts to endangered or threatened species are properly taken into account.

**Response:** Avoiding impacts to seabirds and marine mammals is a specific policy goal identified in the PSEIS, as described in Section 5.2 of this SIR. That goal, as well as obligations under the ESA and Marine Mammal Protection Act, continue to be fulfilled in the Council and NMFS's consideration of information regarding the status of threatened and endangered species and both the proximal and cumulative impacts of groundfish fishery actions on those species. As appropriate, the Council and NMFS have comprehensively evaluated the effects of the groundfish fisheries on threatened and endangered species that have changed their listing status since the issuance of the 2004 PSEIS, including cumulative impacts, as described in Section 6.3 of this SIR. Where warranted the Council and NMFS have taken action to further reduce fishery interactions with endangered or threatened species and their critical habitat. This SIR examined these changes in fishery management and concluded that these actions maintain and support the 2004 PSEIS's conclusions that the groundfish fishery has an insignificant impact on endangered or threatened species.

This SIR examined new information and whether the groundfish fisheries are affecting threatened or endangered species differently than described in the 2004 PSEIS. Section 6 of this SIR summarizes the results of that analysis. No information indicates that the new analysis would conclude that there is now a significant impact where the 2004 PSEIS concludes that the impact was insignificant. Additionally, most of this new information has been analyzed in a subsequent NEPA or ESA analysis. Based on this work, the available new scientific information and research does not suggest a substantial change in our understanding of the impacts of the groundfish fisheries on threatened or endangered species in the BSAI and GOA.

**Comment 5:** Significant declines in PSC species have changed the human environment in a substantial way compared to the 2004 analysis and necessitate re-examination in an SEIS of the biological and socio-economic impacts, including cumulative impacts, of the groundfish fisheries.

**Response:** The 2004 PSEIS established the policy goal to manage incidental catch and reduce bycatch and waste, as described in Section 5.2 of this SIR. This policy goal continues to guide the decision making with regard to ongoing management of the groundfish fisheries. As described under Comment 1, the 2004 PSEIS analyzed an adaptive management program with the ability to react to change in environmental circumstances. Changes include consideration of any changes in the status of those resources as well as cumulative impacts of past, present, and reasonably foreseeable future actions. Consistent with the Council's policy, the Council and NMFS have conducted comprehensive analyses and implemented actions to further reduce Chinook salmon, chum salmon, and halibut PSC and thereby reduce the impacts of the groundfish fisheries to these species, as described in Section 6.2

of this SIR. This SIR examined these changes in fishery management and concluded that these actions maintain and support the 2004 PSEIS's conclusions that the groundfish fishery has an insignificant impact on endangered or threatened species.

This SIR examined this new information and whether the groundfish fisheries are affecting PSC species differently than described in the 2004 PSEIS. Section 6 of this SIR summarizes the results of that analysis. No information indicates that the new analysis would conclude that there is now a significant impact where the 2004 PSEIS concludes that the impact was insignificant. Additionally, most of this new information has been analyzed in a subsequent NEPA analysis. Based on this work, the available new scientific information and research does not suggest a substantial change in our understanding of the impacts of the groundfish fisheries on PSC species in the BSAI and GOA.

**Comment 6:** Important changes in our understanding of climate change, ocean acidification, and the status of several protected or non-target species (Steller sea lions, northern fur seals, Chinook salmon, halibut) have implications on the “significance” determination. The SIR determination that none of the new circumstances and information is “significant” within the meaning of NEPA is based on an incorrect approach to determining significance. The SIR incorrectly examines whether a “seriously different conclusion” is expected from the new information rather than whether the new information may “raise substantial questions” about the potential for significant effects.

**Response:** The SIR examines information and circumstances that have occurred since 2004 that are relevant to environmental concerns and bearing on the management of the groundfish fisheries or their impacts, and evaluates whether the new information and circumstances show that the groundfish fisheries will affect the quality of the human environment in a significant manner or to a significant extent not already considered, as required under NEPA. As explained in Section 3, the SIR approaches the “significance” determination by posing two overarching questions: “Are the impacts predicted in the 2004 PSEIS for the preferred alternative still valid, given any changes since 2004” and “Does the new information present a seriously different picture of the likely impacts of the groundfish fisheries on a particular resource, compared to what was considered in the 2004 PSEIS.” New information and circumstances with regard to target groundfish species, non-target groundfish species (including Chinook salmon and Pacific halibut), marine mammals (including Steller sea lions and northern fur seals) and seabirds, habitats, socioeconomics, and ecosystems (including climate change and ocean acidification) were examined and evaluated in light of these two overarching questions (see Section 6 and Appendices 2 and 4 of the SIR). Based on this examination and evaluation, the Council and NMFS determined that that none of the new circumstances and information is “significant” under NEPA.

The SIR's use of “seriously different conclusion” as the standard for determining significance is consistent with NEPA and case law. Furthermore, this standard encompasses and does not preclude or prevent a determination that new information may raise substantial questions about the potential for significant effects. Evidence of this is seen in Appendix 2 of the SIR. In answering the question “Would a new analysis using the latest methods and information reach a seriously different conclusion,” analysts were specifically asked to provide some discussion if the analyst thought the issue needed further investigation. This clearly supports the ability of an analyst to conclude that the new information raises substantial questions about the potential for significant effects.

**Comment 7:** A new SEIS should be prepared as the supporting analysis to help facilitate the transition to ecosystem-based fishery management in Alaska.

**Response:** The 2004 PSEIS characterized what is today called ecosystem-based fishery management, and served as the vehicle for refining the groundfish management program to address ecosystem considerations in management decisions. The 2004 PSEIS established policy goals that advance ecosystem-based fishery management, as described in Section 5.2 of this SIR. These policy

goals continue to guide the decision making with regard to ongoing management of the groundfish fisheries. Consistent with the Council's policy, the Council and NMFS have taken a number of actions that improve ecosystem-based management in Alaska by minimizing the groundfish fisheries' impacts on ecosystem components, and incorporating ecosystem information into decision-making, as described in Section 6.4 of this SIR.

Additionally, reflective of the Council's ongoing efforts to continue the transition to ecosystem-based fishery management, the Council has adopted an Aleutian Islands Fishery Ecosystem Plan (NPFMC 2007) and is developing a Bering Sea Fishery Ecosystem Plan. Both the AI FEP and the developing BS FEP are action-informing mechanisms that provide a framework for addressing ecosystem considerations in future management decisions. The summary of the preferred alternative from the 2004 PSEIS to the transition to ecosystem-based fishery management can be found in Table 1 of this SIR.

## 8 Conclusions

The objective of this SIR is to synthesize relevant information for the Council and NMFS to determine whether there is a need to supplement the 2004 PSEIS for the Alaska groundfish fisheries. Note, the Council and NMFS may choose to supplement the 2004 PSEIS at any time for a variety of reasons; this SIR simply focuses on whether the triggers have been met that would require the Council and NMFS to supplement the 2004 PSEIS.

As described in Chapter 3, there are two conditions that would require supplementing an EIS:

1. if NMFS and the Council have made a substantial change in the proposed action (i.e., the management of the Federal groundfish fisheries) that is relevant to environmental concerns, or
2. if there are significant new circumstances or information relevant to environmental concerns and bearing on the management of the groundfish fisheries or their impacts.

With respect to the first condition, Section 5 of this SIR identifies the changes to the management program since 2004. All management changes since 2004 have been subject to NEPA analysis. The Council considered these changes in their discussions of this issue in 2012. The SSC discussed the management changes at the March 2012 meeting, and determined that they are all consistent with the preferred alternative evaluated in the 204 PSEIS. As a result, these changes do not represent a substantial change to the management of the Federal groundfish fisheries that is relevant to environmental concerns.

With respect to the second condition, the SIR includes a comprehensive overview of new circumstances and information relevant to environmental concerns, and bearing on the management of the groundfish fisheries or their impacts. Section 6 summarizes the review process undertaken for each of the resource components analyzed in the 2004 PSEIS, which were considered to be impacted by the management of the groundfish fisheries. These include target and non-target fish species, marine mammals and seabirds, habitat, socioeconomic components, and the ecosystem. For each of these components, experts considered whether the status of the component has changed, and whether new information or methods are available to better understand the impacts of the fisheries on that component. Based on this review, experts were asked to identify whether a new analysis, using the latest methods and information, would reach a significantly different conclusion regarding the impact of the groundfish fisheries. A brief summary of their findings is included in Table 19.

**Table 19 Summary of changes to the PSEIS impacts resulting from the SIR review**

Resource component	Would a new analysis using the latest methods and information reach a significantly different conclusion	Which components have a “possibly” response
BSAI and GOA target groundfish species	No/possibly	<ul style="list-style-type: none"> <li>• GOA pollock</li> <li>• GOA blackspotted/rougheye rockfish, dusky rockfish, thornyhead rockfish</li> </ul>
Prohibited species	No/possibly	<ul style="list-style-type: none"> <li>• Pacific salmon</li> </ul>
Other fish species	No	
Marine Mammals	No/possibly	<ul style="list-style-type: none"> <li>• Whales</li> </ul>
Seabirds	No	
Habitat	No	
Socioeconomics	No	
Ecosystem	No	

For most resource components, the new information reported in this SIR does not suggest that a new analysis would result in a significantly different conclusion for impacted resource components. There are some responses that indicate that there is now more information available that might further refine the conclusions in the 2004 PSEIS for their resource component (GOA blackspotted/rougeye rockfish, GOA dusky rockfish, and Pacific salmon). For the two GOA rockfish species, an age-structured model is now available which changes some “unknown” conclusions to “insignificant.” For Pacific salmon, stock of origin information is now available to differentiate bycatch impacts from Bering Sea versus GOA trawl fishing, however new information does not suggest that there is any increase in adverse environmental impact than previously understood, and groundfish fishery impacts have been minimized, to the extent practicable, through management measures.

There are three other responses that indicated the possibility that a new analysis might reach a different conclusion. The first of these is GOA thornyhead rockfish; in this case, uncertainty has developed about the validity of data allowing an age-structured model, so the expert suggests that the “insignificant” conclusion should be changed to “unknown.” The expert does not consider the impacts of the groundfish fishery to be a conservation concern, however. Secondly, with respect to whales, there has been a documented instance of interaction of a groundfish fishery with a harbor porpoise and a sperm whale in recent years, which was not considered at the time of the 2004 PSEIS. There has also been an increase in fisheries-related mortality to humpback whales. These changes indicated some uncertainty for the expert in evaluating the conclusions of the 2004 PSEIS with respect to whales. And finally, the rationale for GOA pollock includes signs of ecosystem change in the GOA as a source of uncertainty about a new conclusion, especially the resurgence of large whales (particularly the humpback whale), and an increase in abundance of arrowtooth flounder.

While the expert reviewers have considered new information specifically from the perspective of each of their resource components, **the decision as to whether to supplement the PSEIS must be based on a consideration of the proposed action as a whole**, that is, the perspective of the overall groundfish management program. As a result, it is incumbent on the Council and NMFS to consider the individual expert reviews, and consolidate them to the level of the overall groundfish management program. From a programmatic perspective, has there been a substantial change in the management of the groundfish fisheries, relevant to environmental concerns? Is the new information on the impact of the groundfish fisheries, relevant to environmental concerns, significant? These are the questions that the Council and NMFS considered.

In April 2014, the Council evaluated the information in the draft SIR, and concluded that a supplemental EIS was not required and that they would not reinstate a new PSEIS. The Council first evaluated the management program in 2012, to see whether there had been substantial changes, and concluded that the management program is still consistent with the 2004 PSEIS’s PA. The PA is described in Section 4.2 of this SIR, and the management changes are documented in Sections 5.1 and 5.2 of this SIR. In the Council’s view, the updated information is still consistent with the Council’s initial conclusion.

Regarding new information on the impact of the groundfish fisheries relevant to environmental concerns, the SIR synthesizes new information for each of the resource components. Based on this evaluation, the Council concluded that there has not been significantly new information to trigger the need for supplementing the PSEIS at this time. The Council acknowledged the SIR’s comprehensive review of the resource components that were evaluated in the 2004 PSEIS, and noted that for almost all resource components the new information does not suggest a new analysis would result in significantly different conclusions. For a few components there may be a new conclusion, but the experts mostly noted that it is not a conclusion that the groundfish fisheries are having a significant impact on that component. Taking the SIR review as a whole, then, to evaluate the overall groundfish program, the Council concluded that

the new information documented in the SIR would not result in a significantly different conclusion regarding the environmental impact of the fisheries.

In preparation for the final SIR, some additional information has been included in the report in response to Council and public comment, and staff has worked with the expert reviewers, in some instances, to ensure that the reviewers have consistently evaluated the 2004 PSEIS conclusions in the light of new information. In the draft SIR, there were several instances where an expert had identified uncertainty as to the outcome of a new programmatic analysis based on a discussion of future work, or ongoing but not yet concluded research, which may have bearing on the resource component. The SIR approach is to consider each resource component based on information that is available at present. To finalize the draft SIR, staff worked with the expert reviewers to ascertain that the reviewers understood the SIR approach, and to update the review to capture work that has been completed to date and to clarify the expert's conclusion, if appropriate.

## 9 Determination

The 2004 PSEIS continues to provide NEPA compliance for the groundfish FMPs and a supplemental NEPA document is not necessary. After reviewing the information presented in the SIR, I determine that—

- (1) The management changes since 2004 do not constitute a substantial change in the action analyzed in the 2004 PSEIS. In analyzing the preferred alternative in the PSEIS, the Council and NMFS recognized that fishery management is dynamic and adaptive. Largely, every management change is related to and advances one or more of the Council's policy goals and objectives and all changes are consistent with the preferred alternative evaluated in the PSEIS.
- (2) The current status of the resources can be considered within the range of variability analyzed in the 2004 PSEIS. For species where there has been a change of status, such as for some marine mammals, NMFS and the Council have responded with the appropriate analysis and action that maintain and support the 2004 PSEIS's conclusions that the groundfish fishery has an insignificant impact on these species with a change in status.
- (3) New information exists regarding the impacts of the groundfish fisheries on resources. Analysts looked at whether the groundfish fisheries are affecting each resource differently than described in the 2004 PSEIS. Section 6 of this SIR summarizes the results of that analysis. According to this analysis, there are a few areas where a new analysis may lead to a different conclusion. However, no information indicates that the new analysis would conclude that there is now a significant impact where the 2004 PSEIS concludes that the impact was insignificant. Additionally, most of this new information has been analyzed in a subsequent NEPA or ESA analysis. Based on this work, the available new scientific information and research does not suggest a substantial change in our understanding of the impacts of the groundfish fisheries on the resources in the BSAI and GOA and does not present significant new circumstances or information relevant to environmental concerns and bearing on the management of the groundfish fisheries or their impacts.



 Administrator, Alaska Region

11/19/15

Date

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## **APPENDICES**

### **Appendix 1 BSAI and GOA groundfish management policy**

The Council's management policy is in the BSAI and GOA groundfish FMPs. The policy is excerpted below.

#### **2.2 Management Approach for the BSAI [GOA] Groundfish Fisheries**

The Council's policy is to apply judicious and responsible fisheries management practices, based on sound scientific research and analysis, proactively rather than reactively, to ensure the sustainability of fishery resources and associated ecosystems for the benefit of future, as well as current generations. The productivity of the North Pacific ecosystem is acknowledged to be among the highest in the world. For the past 25 years, the Council management approach has incorporated forward looking conservation measures that address differing levels of uncertainty. This management approach has in recent years been labeled the precautionary approach. Recognizing that potential changes in productivity may be caused by fluctuations in natural oceanographic conditions, fisheries, and other, non-fishing activities, the Council intends to continue to take appropriate measures to insure the continued sustainability of the managed species. It will carry out this objective by considering reasonable, adaptive management measures, as described in the Magnuson-Stevens Act and in conformance with the National Standards, the Endangered Species Act (ESA), the National Environmental Policy Act, and other applicable law. This management approach takes into account the National Academy of Science's recommendations on Sustainable Fisheries Policy.

As part of its policy, the Council intends to consider and adopt, as appropriate, measures that accelerate the Council's precautionary, adaptive management approach through community-based or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. All management measures will be based on the best scientific information available. Given this intent, the fishery management goal is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries for the well-being of fishing communities; minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions.

This management approach recognizes the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. This policy will use and improve upon the Council's existing open and transparent process of public involvement in decision-making.

##### **2.2.1 Management Objectives**

Adaptive management requires regular and periodic review. Objectives identified in this policy statement will be reviewed annually by the Council. The Council will also review, modify, eliminate, or consider new issues, as appropriate, to best carry out the goals and objectives of this management policy.

To meet the goals of this overall management approach, the Council and NMFS will use the Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (PSEIS) (NMFS 2004) as a planning document. To help focus consideration of potential management measures, the Council and NMFS will use the following objectives as guideposts, to be re-evaluated, as amendments to the FMP are considered over the life of the PSEIS.

***Prevent Overfishing:***

1. Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.
2. Continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries. [Continue to use the existing optimum yield cap for the GOA groundfish fisheries.]
3. Provide for adaptive management by continuing to specify optimum yield as a range.
4. Provide for periodic reviews of the adequacy of  $F_{40}$  and adopt improvements, as appropriate.
5. Continue to improve the management of species through species categories.

***Promote Sustainable Fisheries and Communities:***

6. Promote conservation while providing for optimum yield in terms of the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence, and commercial fishing participants and fishing communities.
7. Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.
8. Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.
9. Promote increased safety at sea.

***Preserve Food Web:***

10. Develop indices of ecosystem health as targets for management.
11. Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.
12. Continue to protect the integrity of the food web through limits on harvest of forage species.
13. Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

***Manage Incidental Catch and Reduce Bycatch and Waste:***

14. Continue and improve current incidental catch and bycatch management program.
15. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
16. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
17. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
18. Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.

19. Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species.
20. Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.
21. Reduce waste to biologically and socially acceptable levels.

***Avoid Impacts to Seabirds and Marine Mammals:***

22. Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.
23. Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.
24. Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
25. Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

***Reduce and Avoid Impacts to Habitat:***

26. Review and evaluate efficacy of existing habitat protection measures for managed species.
27. Identify and designate essential fish habitat and habitat areas of particular concern pursuant to Magnuson-Stevens Act rules, and mitigate fishery impacts as necessary and practicable to continue the sustainability of managed species.
28. Develop a Marine Protected Area policy in coordination with national and state policies.
29. Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.
30. Develop goals, objectives and criteria to evaluate the efficacy and suitable design of marine protected areas and no-take marine reserves as tools to maintain abundance, diversity, and productivity. Implement marine protected areas if and where appropriate.

***Promote Equitable and Efficient Use of Fishery Resources:***

31. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
32. Maintain the license limitation program, modified as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries.
33. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.
34. Develop management measures that, when practicable, consider the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities.

***Increase Alaska Native Consultation:***

35. Continue to incorporate local and traditional knowledge in fishery management.
36. Consider ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
37. Increase Alaska Native participation and consultation in fishery management.

***Improve Data Quality, Monitoring and Enforcement:***

38. Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
39. Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.
40. Improve community and regional economic impact costs and benefits through increased data reporting requirements.
41. Increase the quality of monitoring and enforcement data through improved technology.
42. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.
43. Cooperate with research institutions such as the North Pacific Research Board in identifying research needs to address pressing fishery issues.
44. Promote enhanced enforceability.
45. Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Alaska Department of Fish and Game, and Alaska Fish and Wildlife Protection, the U.S. Coast Guard, NMFS Enforcement, International Pacific Halibut Commission, Federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

## Appendix 2 Template for PSEIS SIR – review of conclusions in 2004 PSEIS

What resource component is this review for? \_\_\_\_\_

What sections of the PSEIS were reviewed? \_\_\_\_\_

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 **Has management of the resource changed?**

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

### 2 **Has the status of the resource changed?**

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

### 3 **Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

### 4 **Are there new methods of analysis or protocols for evaluating impacts?**

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

### 5 **Would a new analysis using the latest methods and information reach a seriously different conclusion?**

If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

### Appendix 3 Changes in target species and species complexes between 2004 and present

The tables below list the species and species complexes that are currently identified in the BSAI and GOA Groundfish FMPs, and compare them to the species or species complexes that were assessed in the 2004 PSEIS. In a few cases, there are discrepancies. For example, shortraker and rougheye rockfish were managed as a complex in 2004, but are now managed separately (in fact, rougheye rockfish is managed as a complex with blackspotted rockfish).

**Table 20 Species or species complexes that are currently identified in the BSAI SAFE report, compared to species or species complexes that were assessed in the 2004 PSEIS**

Species or complexes that were assessed in the 2004 PSEIS		Species or complexes that are now identified in the BSAI SAFE report	
<b>Target species</b>	pollock	<b>Target species</b>	pollock (EBS, AI, Bogoslof)
	pacific cod		pacific cod
	sablefish		sablefish
	yellowfin sole		yellowfin sole
	greenland turbot		greenland turbot
	arrowtooth flounder		arrowtooth flounder
	rock sole		Kamchatka flounder
	flathead sole		Northern rock sole
	alaska plaice		flathead sole
	rex sole		alaska plaice
	dover sole		other flatfish
	Pacific ocean perch		
	northern rockfish		Pacific ocean perch
			northern rockfish
	shortraker/ rougheye rockfish		shortraker rockfish
	yelloweye rockfish		blackspotted/ rougheye rockfish
	dusky rockfish		other rockfish
thornyhead rockfish			
atka mackerel			
squid	atka mackerel		
	squid		
<b>Other species</b>	octopus		octopus
	sharks		sharks
	sculpins		sculpins
	skates		skates
<b>Forage fish</b>	forage fish complex	<b>Ecosystem Component</b>	forage fish complex
<b>Non-specified species</b>	(specific species not listed)		grenadiers <sup>38</sup>

<sup>38</sup> The Council has approved, and NMFS has implemented, an FMP amendment to include grenadiers in the ecosystem component of the BSAI FMP and GOA FMP.

**Table 21 Species or species complexes that are currently identified in the GOA SAFE report, compared to species or species complexes that were assessed in the 2004 PSEIS**

Species or complexes that were assessed in the 2004 PSEIS		Species or complexes that are identified in the GOA SAFE report	
<b>Target Species</b>	pollock	<b>Target species</b>	pollock
	pacific cod		pacific cod
	sablefish		sablefish
	yellowfin sole		shallow water flatfish
	rock sole		
	Alaska plaice		
	dover sole		deep water flatfish
	greenland turbot		
	rex sole		rex sole
	arrowtooth flounder		arrowtooth flounder
	flathead sole		flathead sole
	Pacific ocean perch		Pacific ocean perch
	northern rockfish		northern rockfish
	shortraker/ rougheye rockfish		shortraker/ other slope rockfish
			dusky rockfish
	dusky rockfish		blackspotted and rougheye rockfish
	yelloweye rockfish		pelagic shelf rockfish
	thornyhead rockfish		demersal shelf rockfish
	atka mackerel		thornyhead rockfish
<b>Other species</b>	skates	atka mackerel	
		big skate	
		longnose skate	
		other skates	
	squids	squids	
	octopuses	octopuses	
	sharks	sharks	
	sculpins	sculpins	
<b>Forage fish</b>	forage fish complex	<b>Ecosystem Component</b>	forage fish complex
<b>Non-specified species</b>	(species not listed in FMP)		grenadiers <sup>39</sup>

<sup>39</sup> The Council has approved, and NMFS has implemented, an FMP amendment to include grenadiers in the ecosystem component of the BSAI FMP and GOA FMP.

## Appendix 4 Worksheets from resource component expert reviews

Note, this appendix is available online, as a separate file. Please go to the following webpage to retrieve:  
[www.npfmc.org](http://www.npfmc.org).

### Target Groundfish Species

	BSAI pollock	A1
	BSAI Pacific cod	A3
	Sablefish	A5
	BSAI Atka mackerel	A6
	GOA pollock	A8
	GOA Pacific cod	A10
	GOA Atka mackerel	A11
Flatfish	BSAI yellowfin sole	A12
	BSAI Greenland turbot	A14
	BSAI arrowtooth flounder	A15
	BSAI Kamchatka flounder	A17
	BSAI northern rock sole	A19
	BSAI flathead sole	A21
	BSAI Alaska plaice	A23
	BSAI other flatfish	A25
	GOA arrowtooth flounder	A27
	GOA northern and southern rock sole	A28
	GOA flathead sole	A29
	GOA shallow water flatfish	A31
	GOA deep water flatfish	A32
	GOA rex sole	A34
Rockfish	BSAI Pacific ocean perch	A36
	BSAI northern rockfish	A38
	BSAI shortraker rockfish	A40
	BSAI blackspotted/rougheye rockfish	A42
	BSAI other rockfish	A45
	GOA Pacific ocean perch	A46
	GOA northern rockfish	A48
	GOA shortraker rockfish	A50
	GOA blackspotted/rougheye rockfish	A52
	GOA dusky rockfish	A54
	GOA demersal shelf rockfish	A56
	GOA thornyhead rockfish	A58
	GOA other rockfish	A60
Other species	Squids	A62
	Octopuses	A63
	Sharks	A65
	BSAI sculpins	A66
	GOA sculpins	A68
	BSAI skates	A70
	GOA skates	A71

**Ecosystem component (prohibited and forage fish) and non-specified fish species**

Pacific halibut	A73
Pacific salmon	A75
BSAI king crab	A77
BSAI snow crab	A79
BSAI Tanner crab	A81
GOA crab	A83
Pacific herring	A84
Forage fish complex	A86
Non-specified species (grenadier)	A87

**Marine mammals and seabirds**

Steller sea lions	A89
Northern fur seals	A93
Pinnipeds (harbor seals, ice-associated seals)	A97
Northern elephant seals	A100
Pacific walrus	A101
Whales	A102
Sea otters	A107
Seabirds	A109

**Habitat, Socioeconomics, Ecosystem**

Habitat	A111
Socioeconomics	A115
Ecosystem	A118

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/19/13

What resource component is this review for? EBS Pollock  
What sections of the PSEIS were reviewed? 4.9.1.1

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The control rules governing the over-arching management regulations are unchanged relative to those analyzed in 2004. The principal factors affecting pollock fishery management include: seasonal apportionments (40% during the winter, 60% from June 10-October 31<sup>st</sup>), bycatch of pollock in other fisheries (count against the TAC), the sector-specific TAC allocations (i.e., CDQ, mother-ship, catcher-processors, and shore-based catcher boats), the 2-million t OY cap (which limits pollock TAC to about 1.5 million t), the “Tier 1” ABC/OFL control rules (amendment 56) from the single species assessment, and salmon bycatch avoidance. The control rule (which explicitly takes into account uncertainty in estimation of  $F_{MSY}$ ) constrained the TAC for a couple of years (2009 and 2010) during a period when the stock dropped below the target level (and the upper limit of the harvest rate was required to be adjusted downwards). Specific management actions affect the EBS pollock fishery includes Amendment 91 (implemented in 2011) which set a cap for the number of Chinook salmon that can be taken incidentally. The indirect effect of this measure has amounted to shifts to fishing earlier in the B-season since bycatch rates (in terms of numbers of Chinook salmon per ton of pollock) increases in late September through October. Also, within-industry measures to close salmon bycatch “hot-spots” have affected the areas where pollock fishing can occur.

### 2 Has the status of the resource changed?

The status of the pollock stocks have fluctuated over time since the 2004 PSEIS but remains within the expected range of stock variability estimated at that time. As noted above, the stock has dropped below the target level in the past 10 years but this is as expected.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

The observer coverage for the entire fleet switched to 100% in 2011 as part of the salmon bycatch measures. Previously the shore-based catcher vessels smaller than 125 feet had about 50% of their operations covered by scientific observers (even though the legal mandate was to have only 30% coverage in each quarter of the year).

In addition to the annual bottom-trawl surveys that cover the period 1982-2012, the supplemental dedicated acoustic-trawl surveys ran each summer 2006-2010 as part of a large-scale Bering Sea Integrated Ecosystem Research Program (BSIERP) funded by the North Pacific Research Board (NPRB). Prior to 2006 this acoustic survey ran (typically) every other year. This survey provides valuable direct observations on pre-recruit pollock and improves the information available to make near-term projections

of fishing conditions and stock status (for spawning biomass conservation measures). Additionally, these added survey years allowed the development of valuable opportunistic data collection programs. These opportunistic acoustic data are presently collected on the chartered bottom-trawl survey vessels to provide an alternative index in years that the dedicated research vessel is unavailable. Also, acoustic data are collected from commercial vessels and have proven valuable for evaluating the turnover-rate of pollock abundance during the winter season. This study is of particular importance to help provide information on the forage available to Steller sea lions during their over-wintering period within their critical habitat. This information improves NMFS ability to evaluate fishery impacts and to provide better more-timely advice on stock status and catch limit recommendations.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The main assessment methodology is similar to that done for the 2004 PSEIS. However, the data collection and evaluations have improved on comprise new methods (e.g., developing an index from opportunistically collected acoustic data). Techniques to test assessment-management approaches which involve the development of operating models is underway and have been applied (e.g., decision tables, climate change effects etc.). The technical interactions model used for the PSEIS remains unchanged but presently research is underway to improve that approach and update the data streams used for that model.

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Results from new analyses using an updated technical interaction model would likely be provide a similar conclusions. Anticipated differences would include added complexity to the management (e.g., due to salmon bycatch regulation changes). Difficulties in appropriately mimicking the TAC setting process may also be greater than in the past due to the larger number of constraints and having information that would predict recent trends (e.g., using different gear configurations to avoid salmon and/or crab and halibut).

## PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? BSAI Pacific cod  
What sections of the PSEIS were reviewed? 4.9.1.2

### 1 Has management of the resource changed?

The only two FMP amendments since 2004 (inclusive) that reference Pacific cod explicitly are Amendments 77 and 85.

Amendment 77 was implemented January 1, 2004. This amendment revised Amendment 64. It implemented a Pacific cod fixed gear allocation between hook and line catcher processors (80 percent), hook and line catcher vessels (0.3 percent), pot catcher processors (3.3 percent), pot catcher vessels (15 percent), and catcher vessels (pot or hook and line) less than 60 feet (1.4 percent).

Amendment 85 was partially implemented on March 5, 2007. This amendment superseded Amendments 46 and 77. It implemented a gear allocation among all non-CDQ fishery sectors participating in the directed fishery for Pacific cod. After deduction of the CDQ allocation, the Pacific cod TAC is apportioned to vessels using jig gear (1.4 percent); catcher processors using trawl gear listed in Section 208(e)(1)-(20) of the AFA (2.3 percent); catcher processors using trawl gear as defined in Section 219(a)(7) of the Consolidated Appropriations Act, 2005 (Public Law 108-447) (13.4 percent); catcher vessels using trawl gear (22.1 percent); catcher processors using hook-and-line gear (48.7 percent); catcher vessels  $\geq 60'$  LOA using hook-and-line gear (0.2 percent); catcher processors using pot gear (1.5 percent); catcher vessels  $\geq 60'$  LOA using pot gear (8.4 percent); and catcher vessels  $< 60'$  LOA that use either hook-and-line gear or pot gear (2.0 percent).

Attachment 2.3 to the 2012 BSAI Pacific cod assessment describes regulations specific to the BSAI Pacific cod fisheries.

### 2 Has the status of the resource changed?

Relative to MSST, the status of BSAI Pacific cod remains the same, qualitatively speaking. Based on the 2012 stock assessment, projections for the 2013-2017 time period are fairly similar to the projections for 2007 contained in the 2004 PSEIS. For example, projected total biomass is within 10-19% of the value projected previously under PA.1 and within 12-21% of the value projected previously under PA.2, projected spawning biomass is within 5-11% of the value projected previously under PA.1 and within 7-9% of the value projected previously under PA.2, projected fishing mortality is within 8% of the value projected previously under PA.1 and within 14% of the value projected previously under PA.2, and projected average age (exclusive of age zero) is within 2-11% of the value projected previously under PA.1 and within 3-10% of the value projected previously under PA.2.

A related issue is how “the resource” should be defined in the case of BSAI Pacific cod. Although BSAI Pacific cod has, and continues to be, managed as a unit stock, recent research suggests that AI Pacific cod would be more appropriately managed as a separate stock, and it is likely that management will be split into separate EBS and AI units in the very near future. However, no age-structured model of the AI stock has been accepted by the SSC, and stock status continues to be determined on a BSAI-wide basis at the present time.

**3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

New information regarding impacts of the groundfish fishery on the resource is incorporated annually in the stock assessment. This new information consists primarily of total catch weight (including discards), stratified by year, season, and gear; and catch length composition, stratified by the same three factors. In addition, research by Ingrid Spies (PhD dissertation, in prep.) is evaluating potential impacts of differential fishing mortality rates on Pacific cod in the EBS and AI.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The model used in the stock assessment has changed considerably since 2002. These changes are documented in the 2012 stock assessment, beginning on page 254.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

I doubt it. Of course, it is not possible to predict the results of a future analysis based on a yet-to-be-developed age-structured model for the AI stock.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 5/30/2013

What resource component is this review for? \_\_\_Sablefish  
What sections of the PSEIS were reviewed? \_\_\_4.9.1.3

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

A minor change in gear restrictions occurred in 2008, when the pot fishing ban was repealed for the Bering Sea during June 1-30 (74 FR 28733). This should have no significant impact on the resource.

### **2 Has the status of the resource changed?**

The status of the sablefish stock is similar to the status during the 2004 PSEIS and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

There was an increase in the BSAI fisheries in the use of pot gear to catch sablefish during 2004-2008, which has recently decreased again. The catch from pot gear was analyzed and shown to have minimal differences from longline gear and size of fish harvested (Sablefish SAFE, Hanselman et al. 2009).

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The methodology is similar to the 2004 PSEIS.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses modern methods and the sablefish assessment model is relatively robust to the assumptions of the analysis.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/5/2013

What resource component is this review for? **BSAI Atka mackerel**

What sections of the PSEIS were reviewed? **Section 4.9.1.4 Atka Mackerel**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

The management of the BSAI Atka mackerel fishery changed significantly in 2011 due to the implementation of Reasonable and Prudent Alternatives included in the 2010 Biological Opinion which required changes in groundfish fishery management in Management Sub-areas 543, 542, and 541 in the Aleutian Islands Management Area. In area 543, retention of Atka mackerel and Pacific cod is prohibited. In area 542, the TAC for Atka mackerel is set to no more than 47 percent of the Area 542 acceptable biological catch (ABC). Additionally, there are year round closures to directed fishing for Atka mackerel in defined areas of critical habitat and limits within defined areas of critical habitat for vessels participating in harvest cooperatives or CDQ fisheries. In area 541 the Bering Sea subarea is closed to year round fishing for the directed Atka mackerel fishery.

Amendment 80 to the BSAI Groundfish FMP was adopted by the Council in June 2006 and implemented for the 2008 fishing year. This action allocated several BSAI non-pollock trawl groundfish species among trawl fishery sectors, and facilitated the formation of harvesting cooperatives in the non-American Fisheries Act (non-AFA) trawl catcher/processor sector. Bering Sea/Aleutian Islands Atka mackerel is one of the groundfish species directly affected by Amendment 80.

### **2 Has the status of the resource changed?**

The status of the BSAI Atka mackerel stock is higher than the status described in the 2004 PSEIS due to the impact of strong year classes, most notably the 1999, 2000, 2001, and 2006 year classes. Also, due to changes in the stock assessment model configuration since 2004, our knowledge and perception of the stock status has improved. The status of the BSAI Atka mackerel stock is within the range of variability estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

The BSAI Atka mackerel fishery changed significantly since 2004 due to the implementation of Reasonable and Prudent Alternatives included in the 2010 Biological Opinion which required changes in groundfish fishery management in Management Sub-areas 543, 542, and 541 in the Aleutian Islands Management Area. The fishery and the impacts of the fishery were analyzed in the 2010 Biological Opinion and in the Draft Stellar Sea Lion Protection Measures Environmental Impact Statement (SSL EIS). Changes to the fishery have been described and modeled in the BSAI stock assessment on an annual basis.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The basic methodology for evaluating impacts (age-structured model) is similar to the 2004 PSEIS.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

New and updated fishery information and improvements to the age structured model are incorporated into the stock assessment, but has not resulted in a different conclusion about the effect of the groundfish fisheries on the resource.

## **Template for PSEIS SIR – review of conclusions in 2004 PSEIS**

*draft 6/13/13*

What resource component is this review for? \_\_\_ Gulf of Alaska walleye pollock  
 What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.1

### **1 Has management of the resource changed?**

There have been no changes to the harvest control rules specifying the OFL harvest rate, the maximum acceptable ABC, and the author's recommended ABC since the 2002 stock assessment for GOA pollock. Other features of the management system, such as the B20% limit for the target fishery, and the procedure for spatially and temporally allocating the ABC are also unchanged. Additional survey information is available for allocating the ABC between areas during the winter fishery (A and B seasons). Since the harvest control rule depends on estimated quantities from the stock assessment (such as mean recruitment, weight at age, and fishery selectivity), the values used to specify the harvest control rule, such as B35%, F40%, have changed. However the process used to calculate them has not.

With respect to in-season management of the pollock fishery, the trip limit regulation for the pollock target fishery in the GOA was fine-tuned to better achieve its original intent. Also Chinook salmon bycatch limits were established for the GOA pollock fishery by FMP Amendment.

### **2 Has the status of the resource changed?**

The current status of the Gulf of Alaska walleye pollock stock is similar to the status during the 2004 PSEIS, and is within the range of variability of the estimates at that time. In the 2002 assessment, pollock was estimated to be at 28% of unfished spawning biomass in 2003. In the 2012 assessment, GOA pollock was estimated to be at 35.1% of unfished spawning biomass. Pollock biomass has been relatively stable during the last decade, but in the last couple of years has shown an increasing trend.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Ongoing fishing impacts on groundfish EFH were evaluated during the 5-year EFH review. Results of this analysis may be useful in future EIS evaluations.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Methods are being developed at AFSC to explore the implications of incorporating stock-specific uncertainty buffers to establish ABCs.

Teresa A'mar completed her dissertation in 2009 on a Management Strategy Evaluation of GOA pollock . Her work evaluated the performance of the current stock assessment methodology and management system (references below) .

No new methods of analysis have been used in NEPA analyses of management actions.

References for the management strategy evaluation for GOA pollock

A'mar, Z.T., A.E. Punt, and M.W. Dorn. 2008. The Management Strategy Evaluation Approach and the Fishery for Walleye Pollock in the Gulf of Alaska. Pages 317-346. In: Kruse, G.H., Drinkwater, K.,

Ianelli, J.N., Link, J.S., Stram, D.L., Wespestad, V., and Woodby, D. [Eds.] Proceedings of 24th Lowell Wakefield Fisheries Symposium: Resiliency of Gadid Stocks to Fishing and Climate Change. Alaska Sea Grant College Program, University of Alaska Fairbanks, AK.

A'mar, Z.T., A.E. Punt, and M.W. Dorn. 2009. The evaluation of two management strategies for the Gulf of Alaska walleye pollock fishery under climate change. ICES Journal of Marine Science, 66: 1614-1632.

A'mar, Z.T., A.E. Punt, and M.W. Dorn. 2009. The impact of regime shifts on the performance of management strategies for the Gulf of Alaska walleye pollock fishery. Canadian Journal of Fisheries and Aquatic Sciences, 66(12): 2222-2242.

A'mar, Z.T., A.E. Punt, and M.W. Dorn. 2010. Incorporating ecosystem forcing through predation into a Management Strategy Evaluation for the Gulf of Alaska walleye pollock (*Theragra chalcogramma*) fishery. Fisheries Research, 102(1-2): 98-114.

## **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

It is difficult to say what the outcome of a new analysis would be. The GOA pollock MSE mentioned above did not find any serious failings of the current assessment and management system. In general, groundfish fisheries in the Gulf of Alaska have been fairly stable since 2002, and the changes that have been implemented were contemplated by two bookend alternatives in the PSEIS. Therefore it might be reasonable to expect that a new analysis would reach similar conclusions to the 2004 PSEIS.

There two changes in the GOA ecosystem that may merit further evaluation. The first is the continued increase in abundance of arrowtooth flounder, a major predator of pollock in the GOA. The second is the resurgence of large whales in the GOA ecosystem, in particular, humpback whales (*Megaptera novaeangliae*).

## PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/13/13

What resource component is this review for? \_\_\_GOA Pacific cod

What sections of the PSEIS were reviewed? \_\_\_4.9.1.2

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

An adjustment among gear and operational sectors occurred in 2012, when Amendment 83 of the GOA Groundfish FMP was enacted. This should have no significant impact on the resource.

### **2 Has the status of the resource changed?**

The status of the GOA Pacific cod stock is similar to the status during the 2004 PSEIS and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

The fisheries observer program was restructured in 2013. This change will result in differences in the fishery data collected, and the significance of these changes for the GOA Pacific cod stock will not be determined for several years.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The methodology is similar to the 2004 PSEIS.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses modern methods and the GOA Pacific cod assessment model is relatively robust to the assumptions of the analysis.

## **Template for PSEIS SIR – review of conclusions in 2004 PSEIS**

*draft 6/5/13*

What resource component is this review for? **GOA Atka mackerel**

What sections of the PSEIS were reviewed? **Section 4.9.1.4 Atka Mackerel**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

No, Gulf of Alaska (GOA) Atka mackerel has been managed under Tier 6 specifications since 1996 due to the lack of reliable estimates of current biomass. Gulf of Alaska Atka mackerel are managed as a bycatch species. The total allowable catch (TAC) for GOA Atka mackerel is intended to provide for anticipated bycatch needs of other fisheries, principally for Pacific cod, rockfish and pollock, and to only allow for minimal targeting. The TACs for 2004-2005 were 600 t, 1,500 t for 2006-2008, and have been set at 2,000 t for 2009 to 2013.

Gulf of Alaska Atka mackerel has been moved to a biennial stock assessment schedule to coincide with the availability of new survey data from the biennial trawl survey. A full assessment is presented in odd years. On alternate (even) years an executive summary is presented with updated catch, the previous year's key assessment parameters, any significant new information available in the interim, and projections for the upcoming year.

### **2 Has the status of the resource changed?**

Information for GOA Atka mackerel is very limited and consists of catch information and small samples of age data. The data show fluctuations in the catches and distribution of GOA Atka mackerel coinciding with strong year classes observed in the Aleutian Islands. The strong year classes observed in the Aleutian Islands dominate the limited age compositions of GOA Atka mackerel.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

No, there has not been a directed fishery for Atka mackerel since 1996. Annual changes in the GOA Atka mackerel catches reflect shift in catches of other species which catch Atka mackerel as bycatch.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

No, there have been no changes to the assessment methodology. Gulf of Alaska Atka mackerel have been assessed and managed under Tier 6 specifications since 1996 due to lack of reliable estimates of current biomass.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No, limited new and updated fishery information are discussed in the stock assessment, but has not resulted in a different conclusion about the effect of the groundfish fisheries on the resource.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/3/2013

What resource component is this review for? **BSAI yellowfin sole**

What sections of the PSEIS were reviewed? **Section 4.9.1.5**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

The management of the yellowfin sole fishery changed significantly in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. In addition, Amendment 80 also mandated additional monitoring requirements which included observer coverage on all hauls, motion-compensating scales for weighing samples, flow scales to obtain accurate catch weight estimates for the entire catch, no mixing of hauls and no on-deck sorting. The partitioning of TAC and PSC (prohibited species catch) among cooperatives has significantly changed the way the annual catch has accumulated (slower and more evenly) and the rate of target catch per bycatch ton (less).

### **2 Has the status of the resource changed?**

The status of the BSAI yellowfin sole stock is similar to the status during the 2004 PSEIS, well above the target reference points and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Since 2004 the yellowfin sole stock assessment analysis has changed from Tier 3 methodology to Tier 1 resulting in differences in the way the productivity of the stock and risk is incorporated into the ABC calculation.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Some new information regarding temperature-dependent growth has become available and is incorporated into the stock assessment but it has not resulted in a different conclusion about the effect of the groundfish fisheries on the resource.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/10/2013

What resource component is this review for? \_\_\_ BSAI Greenland turbot  
What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.9

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

There have been no changes to management of the BSAI Greenland turbot stock since 2004.

### **2 Has the status of the resource changed?**

Although the stock spawning biomass has declined the status of the BSAI Greenland turbot is similar to the status during the 2004 PSEIS and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

There has been no new information regarding the impacts of the groundfish fisheries on this stock.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The methodology is similar to the 2004 PSEIS.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses modern methods and the BSAI Greenland turbot assessment model is relatively robust to the assumptions of the analysis.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/10/2013

What resource component is this review for? **BSAI arrowtooth flounder**

What sections of the PSEIS were reviewed? **Section 4.9.1.8**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

No, BSAI arrowtooth flounder were assessed and managed under Tier 3a in 2002 and continue to be managed with this methodology. The same model has been used since 2002.

### 2 Has the status of the resource changed?

The status of the resource has been consistently increasing since 2002. The spawning biomass of female BSAI arrowtooth flounder was estimated to be 475,900 mt at the beginning of 2002. At the beginning of 2013, female spawning biomass was estimated at 638,377 mt.

### 2 Is there new information regarding the impacts of the groundfish fisheries on the resource?

The model estimates the fishing mortality rate on arrowtooth flounder by the fishery, both as a targeted fishery and as bycatch. The estimated fishing mortality rate was 0.015 in 2002 and 0.014 in 2013, and remained stable during the intervening period. Only a fraction of the recommended ABC is taken in the fishery; the estimated catch from 2002 – 2013 has been less than 20,000 mt even though the ABC has been over 100,000 mt for each of those years.

New information from NMFS research surveys and fishery length data are used in the assessment; EBS slope survey was conducted in 2002 2004 2008 2010 2012, the Aleutian Islands survey was conducted in 2002 2004 2006 2010 2012, and the EBS shelf survey was conducted every year since 2002. New fishery length data is incorporated from each year since 2002.

### 3 Are there new methods of analysis or protocols for evaluating impacts?

No significant new analyses have been implemented to assess the effect of the groundfish fishery on arrowtooth flounder.

### 4 Would a new analysis using the latest methods and information reach a seriously different conclusion?

Recently, a new maturity ogive was published for female arrowtooth flounder (Stark, J. 2008. Age- and length-at-maturity of female arrowtooth flounder (*Atheresthes stomias*) in the Gulf of Alaska. Fish. Bull. 106: 328–333). This work motivated a re-analysis of the estimated arrowtooth flounder biomass using the current model with several different maturity ogives. Although maturity ogives have a significant effect

on the estimate of female spawning biomass, all estimates were well above  $B_{40\%}$  and all showed an increasing trend in arrowtooth female spawning biomass since 2002.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/3/2013

What resource component is this review for? **BSAI Kamchatka flounder**

What sections of the PSEIS were reviewed? **Section 4.9.1.8**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The management of the Kamchatka flounder fishery has changed significantly since 2004. In the eastern part of their range, Kamchatka flounder overlap with arrowtooth flounder (*Atheresthes stomias*) which are very similar in appearance and were not routinely distinguished in the commercial catches until 2007. Until about 1992, these species were also not consistently separated in trawl survey catches and were combined in the arrowtooth flounder stock assessment (Wilderbuer et al. 2009). However, managing the two species as a complex became undesirable in 2010 due to the emergence of a directed fishery for Kamchatka flounder in the BSAI management area. Since the ABC was determined by the large amount of arrowtooth flounder relative to Kamchatka flounder (complex is about 93% arrowtooth flounder) the possibility arose of an overharvest of Kamchatka flounder as the *Atheresthes sp.* ABC exceeded the Kamchatka flounder biomass. Arrowtooth and Kamchatka flounder have been managed separately since 2011.

### 2 Has the status of the resource changed?

The status of the BSAI Kamchatka flounder stock is similar to the status during the 2004 PSEIS as indicated by the results of the Bering Sea shelf, slope and Aleutian Islands surveys. The stock biomass is estimated to have increased or remained at the same level in all three areas and remains within the range of variability of the estimates from 2004.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fisheries resulting in less impact to the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

The Kamchatka flounder assessment is presently a Tier 5 assessment reliant upon survey biomass estimates and an estimate of natural mortality to set the annual ABC and OFL levels. Work is progressing to elevate the assessment to a Tier 3 level for the 2014 fishing season by utilizing age, size, growth, maturity and improved natural mortality information as well as survey abundance and fishery catch.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Although new information and modeling techniques will improve the stock assessment it is not expected that a seriously different conclusion regarding stock condition will result since the fishery-independent information is on the same order as before and the fisheries mortality remains at a moderate level.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/3/2013

What resource component is this review for? **BSAI northern rock sole**

What sections of the PSEIS were reviewed? *Section 4.9.1.6*

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

The management of the northern rock sole fishery changed significantly in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. In addition, Amendment 80 also mandated additional monitoring requirements which included observer coverage on all hauls, motion-compensating scales for weighing samples, flow scales to obtain accurate catch weight estimates for the entire catch, no mixing of hauls and no on-deck sorting. The partitioning of TAC and PSC (prohibited species catch) among cooperatives has significantly changed the way the annual catch has accumulated (slower and more evenly) and the rate of target catch per bycatch ton (less).

### **2 Has the status of the resource changed?**

The status of the BSAI northern rock sole stock is similar to the status during the 2004 PSEIS, well above the target reference points and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Since 2004 the northern rock sole stock assessment analysis has changed from a Tier 3 methodology to a Tier 1 approach resulting in differences in the way the productivity of the stock and risk is incorporated into the ABC calculation (northern rock sole SAFE, Wilderbuer et al. 2012).

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Some new information regarding temperature-dependent growth has become available for northern rock sole and is planned be incorporated into the stock assessment but it is unlikely that it will result in a different conclusion about the effect of the groundfish fisheries on the resource.

## Review of Conclusions in 2004 PSEIS

draft 6/19/2013

What resource component is this review for? **BSAI flathead sole**

What sections of the PSEIS were reviewed? **Section 4.9.1.7**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The management of the flathead sole fishery changed significantly in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. In addition, Amendment 80 also mandated additional monitoring requirements which included observer coverage on all hauls, motion-compensating scales for weighing samples, flow scales to obtain accurate catch weight estimates for the entire catch, no mixing of hauls and no on-deck sorting. The partitioning of TAC and PSC (prohibited species catch) among cooperatives has significantly changed the way the annual catch has accumulated (slower and more evenly) and the rate of bycatch per target catch ton (less).

### 2 Has the status of the resource changed?

Total biomass of the BSAI flathead sole stock at the beginning of 2013 (Stockhausen and Nichol, 2012) was projected in 2012 to be ~750,000 t, almost 50% larger than that considered in the 2004 PSEIS (513,000 t). Female spawning biomass in 2013 was projected in 2012 (Stockhausen and Nichol, 2012) to be almost 250,000 t, whereas the spawning biomass considered in the 2004 PSEIS was approximately 230,000 t. Thus, both spawning biomass and total biomass are currently larger than that considered in the 2004 PSEIS. In addition, spawning biomass is substantially larger than  $B_{35\%}$  for this stock. Qualitatively, then, the status of the resource has not changed since the 2004 PSEIS.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

Yes. For the purposes of the 2004 PSEIS, BSAI flathead sole was evaluated as a Tier 4 stock. Beginning in 2004, and in subsequent years, flathead sole was evaluated as a Tier 3 stock (e.g., Stockhausen and Nichol, 2012). As such, reliable estimates of  $B_{35\%}$  (i.e., a proxy for  $B_{msy}$ ) are now available that were not at the time of the 2004 PSEIS. However, similar conclusions would be reached with these (Tier 3) methods as were reached in the 2004 PSEIS.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

**Citations**

Stockhausen, W. and D. Nichol. 2012. Chapter 9: Assessment of the Flathead Sole Stock in the Bering Sea and Aleutian Islands. *In*: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Region. North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, Alaska 99510. <http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIfathead.pdf>

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/3/2013

What resource component is this review for? **BSAI Alaska plaice**  
What sections of the PSEIS were reviewed? *Section 4.9.1.10*

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

The management of the Alaska plaice fishery changed significantly in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. In addition, Amendment 80 also mandated additional monitoring requirements which included observer coverage on all hauls, motion-compensating scales for weighing samples, flow scales to obtain accurate catch weight estimates for the entire catch, no mixing of hauls and no on-deck sorting. The partitioning of TAC and PSC (prohibited species catch) among cooperatives has significantly changed the way the annual catch has accumulated (slower and more evenly) and the rate of target catch per bycatch ton (less).

### **2 Has the status of the resource changed?**

The status of the BSAI Alaska plaice stock is similar to the status during the 2004 PSEIS, well above the target reference points and within the range of variability of the estimates at that time.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The stock assessment methods and protocols in the latest assessment do not differ substantially from those used in 2004. The annual trawl survey was extended into the northern Bering Sea in 2010 and indicated about 38% of the Bering Sea resource inhabit the northern waters which are currently unavailable to the fishery.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses modern methods to assess the Alaska plaice resource which is high in abundance and lightly harvested.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/3/2013

What resource component is this review for? **BSAI Other flatfish**  
What sections of the PSEIS were reviewed? **Section 4.9.1.10**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

The management of the Alaska plaice fishery changed significantly in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. In addition, Amendment 80 also mandated additional monitoring requirements which included observer coverage on all hauls, motion-compensating scales for weighing samples, flow scales to obtain accurate catch weight estimates for the entire catch, no mixing of hauls and no on-deck sorting. The partitioning of TAC and PSC (prohibited species catch) among cooperatives has significantly changed the way the annual catch has accumulated (slower and more evenly) and the rate of target catch per bycatch ton (less). Although the species of this complex are not directly targeted, the increased observer information should guard against the unintended consequences of managing a complex of species where disproportionate harvest can occur.

### **2 Has the status of the resource changed?**

The status of the BSAI Other flatfish complex is similar to the status during the 2004 PSEIS, both in terms of biomass and catch levels.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The stock assessment methods and protocols in the latest assessment do not differ substantially from those used in 2004. The present assessment using survey averaging of the past 7 years to calculate the ABC compared to using just the present year as was done in 2004.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses annual survey methods to assess the BSAI Other flatfish resource which is lightly harvested, primarily as bycatch in pursuit of other targeted species.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/10/2013

What resource component is this review for? **GOA arrowtooth flounder**

What sections of the PSEIS were reviewed? **Section 4.9.1.8**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 **Has management of the resource changed?**

GOA arrowtooth flounder were assessed and managed under Tier 3a in 2002 and continues to be managed with this methodology. The same model has been used since 2002. In 2006, the Gulf of Alaska arrowtooth flounder (*Atheresthes stomias*) stock was moved to a biennial stock assessment schedule to coincide with new survey data.

### 2 **Has the status of the resource changed?**

The status of the resource has been consistently increasing since 2002. The estimated total biomass of GOA arrowtooth flounder was estimated to be 1,816,000 mt at the beginning of 2002. Total biomass has been consistently increasing since that time and was estimated to be 2,055,560 mt at the beginning of 2013.

### 2 **Is there new information regarding the impacts of the groundfish fisheries on the resource?**

The Gulf of Alaska NMFS research survey takes place on a biennial basis; therefore, new survey information is available in even years. These surveys are expected to reflect the impact of groundfish fisheries on the resource. New fishery length data has been incorporated each year since 2002.

### 3 **Are there new methods of analysis or protocols for evaluating impacts?**

No significant new analyses have been implemented to assess the effect of the groundfish fishery on arrowtooth flounder.

### 4 **Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/13/13

What resource component is this review for? \_\_\_GOA northern and southern rock sole

What sections of the PSEIS were reviewed? \_\_\_4.9.1.6

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The GOA northern and southern rock sole stocks were moved from NPFMC Tier 4 to Tier 3 in 2012. This change should have no significant impact on the resource, as the stocks are still managed as part of the GOA shallow-water flatfish complex.

### 2 Has the status of the resource changed?

The status of the GOA northern and southern rock sole stocks is similar to the status of the GOA shallow-water flatfish complex during the 2004 PSEIS and within the range of variability of the estimates at that time.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There are length and age composition data from the GOA NMFS bottom trawl survey for northern and southern rock sole for all survey years, although the data before 1996 are for undifferentiated rock sole. In addition, the fisheries observer program was restructured in 2013. This change will result in differences in the fishery data collected, and the significance of these changes for the GOA northern and southern rock sole stocks will not be determined for several years.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

The methodology is similar to the 2004 PSEIS.

### 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

No. The current analysis uses modern methods and the GOA northern and southern rock sole assessment model is relatively robust to the assumptions of the analysis.

## Review of Conclusions in 2004 PSEIS

draft 6/11/2013

What resource component is this review for? **GOA flathead sole**

What sections of the PSEIS were reviewed? **Section 4.9.1.7**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Amendment 75 to the GOA Groundfish FMP (implemented June, 2005) revised the FMP to require that TACs be set equal or less than ABC (FMP Appendices, 2012). Amendment 87 (implemented Nov., 2010) revised the FMP to require annual catch limits (ACLs) and the use of accountability measures to ensure that ACLs are not exceeded, in accordance with National Standard 1 guidelines.

### 2 Has the status of the resource changed?

Based on a Tier 3 analysis, total biomass of the GOA flathead sole stock at the beginning of 2012 was projected in 2011 to be ~325,000 t, while female spawning biomass was projected to be almost ~110,000 t. The latter is almost  $3x B_{35\%}$  (a proxy for  $B_{msy}$ ) for this stock. Similar values were not available for the 2004 PSEIS, thus a determination of whether the stock was “overfished” could not be made. However, estimates of the trend ion survey biomass indicate that the population has increased since the 2004 PSEIS.

The catch taken in 2010 (3,842 t) was less than 10% of the ABC (47,422 t). While larger than the catch taken in 2002 (2,000 t; 2004 PSEIS, Section 4.9.1.7), the catch in 2010 was also well below the ABC, indicating that the stock continues to be only lightly exploited.

Qualitatively, then, it seems almost certain that the status of the resource has not changed since the 2004 PSEIS.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Yes. Estimates of total biomass and spawning biomass, as well as age and size composition, were not available for GOA flathead sole in the 2004 PSEIS. Estimates of these quantities are now available (Stockhausen et al., 2011).

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Yes. For the purposes of the 2004 PSEIS, GOA flathead sole was evaluated as a Tier 4 stock. Beginning in 2003, and in subsequent years, GOA flathead sole has been evaluated as a Tier 3 stock (Stockhausen et al., 2011). As such, reliable estimates of  $B_{35\%}$  (i.e., a proxy for  $B_{msy}$ ) are now available that were not at the time of the 2004 PSEIS. However, GOA flathead sole is lightly exploited and similar conclusions would be reached with these (Tier 3) methods as were reached in the 2004 PSEIS.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

**Citations**

NPFMC. 2012. Fishery Management Plan for Groundfish of the Gulf of Alaska: Appendices. [http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA\\_appdcs.pdf](http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA_appdcs.pdf)

Stockhausen, W. M.E. Wilkins and M.H. Martin. 2011. Chapter 8: Assessment of the Flathead Sole Stock in the Gulf of Alaska. *In: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska Region*. North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, Alaska 99510. <http://www.afsc.noaa.gov/REFM/docs/2011/GOAflathead.pdf>

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/27/2013

What resource component is this review for? **GOA shallow water flatfish**

What sections of the PSEIS were reviewed? **Section 4.9.1.8**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

GOA shallow-water flatfish are managed as a complex, however species ABC's are determined under different tiers. The majority of the biomass is northern and southern rock sole which have been moved to Tier 3 in 2012 with the development of an assessment model. Other species in the complex are managed under Tier 5.

### **2 Has the status of the resource changed?**

Rock sole survey biomass increased to 2009, then decreased in 2011. Other flatfish in the complex have generally been increasing or show no trend since 2004.

### **2 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

The Gulf of Alaska NMFS research survey takes place on a biennial basis. These surveys are expected to reflect the impact of groundfish fisheries on the resource.

### **3 Are there new methods of analysis or protocols for evaluating impacts?**

No significant new analyses have been implemented to assess the effect of the groundfish fishery on the GOA shallow-water complex.

### **4 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

## Review of Conclusions in 2004 PSEIS

draft 6/11/2013

What resource component is this review for? **GOA deepwater flatfish**

What sections of the PSEIS were reviewed? **Section 4.9.1.9**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Yes. Amendment 75 to the GOA Groundfish FMP (implemented June, 2005) revised the FMP to require that TACs be set equal or less than ABC (FMP Appendices, 2012). Amendment 87 (implemented Nov., 2010) revised the FMP to require annual catch limits (ACLs) and the use of accountability measures to ensure that ACLs are not exceeded, in accordance with National Standard 1 guidelines.

### 2 Has the status of the resource changed?

No. Although an age-structured assessment model now exists for GOA rex sole, this stock remains a Tier 5 species because a reliable estimate for  $F_{35\%}$  does not exist--the fishery is selective only for mature fish and this renders an estimate of  $F_{35\%}$  highly uncertain. Estimates of the trends in total and spawning biomass, as well as survey biomass from the GOA groundfish trawl survey, indicate that the population has increased since the 2004 PSEIS (Stockhausen et al., 2011). The catch taken in 2010 (3,636 t) was less than the ABC (9,729 t). While larger than the catch taken in 2002 (3,000 t; 2004 PSEIS, Section 4.9.1.10), the catch in 2010 was also well below the ABC, indicating that the stock continues to be only lightly exploited. Qualitatively, then, it seems almost certain that the status of the resource has not changed since the 2004 PSEIS.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Yes. Estimates of current total biomass and spawning biomass, as well as age and size composition, were not available for GOA rex sole in the 2004 PSEIS. Estimates of these quantities are now available (Stockhausen et al., 2011).

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Yes. Subsequent to the 2004 PSEIS, an age-structured assessment model was developed for GOA rex sole. This model provides time series estimates of total and spawning stock biomass. Current year estimates of total and spawning stock biomass are both currently at high levels relative to estimates for 2004.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The GOA deepwater flatfish stock complex is lightly exploited and similar conclusions would be reached with the current methods as were reached in the 2004 PSEIS.

**Citations**

NPFMC. 2012. Fishery Management Plan for Groundfish of the Gulf of Alaska: Appendices. [http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA\\_appdcs.pdf](http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA_appdcs.pdf)

Stockhausen, W. M.E. Wilkins and M.H. Martin. 2011. Chapter 6: Assessment of the Rex Sole Stock in the Gulf of Alaska. *In*: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska Region. North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, Alaska 99510. <http://www.afsc.noaa.gov/REFM/docs/2011/GOArex.pdf>

## Review of Conclusions in 2004 PSEIS

draft 6/11/2013

What resource component is this review for? **GOA rex sole**  
 What sections of the PSEIS were reviewed? **Section 4.9.1.10**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Yes. Amendment 75 to the GOA Groundfish FMP (implemented June, 2005) revised the FMP to require that TACs be set equal or less than ABC (FMP Appendices, 2012). Amendment 87 (implemented Nov., 2010) revised the FMP to require annual catch limits (ACLs) and the use of accountability measures to ensure that ACLs are not exceeded, in accordance with National Standard 1 guidelines.

### 2 Has the status of the resource changed?

No. Although an age-structured assessment model now exists for GOA rex sole, this stock remains a Tier 5 species because a reliable estimate for  $F_{35\%}$  does not exist--the fishery is selective only for mature fish and this renders an estimate of  $F_{35\%}$  highly uncertain. Estimates of the trends in total and spawning biomass, as well as survey biomass from the GOA groundfish trawl survey, indicate that the population has increased since the 2004 PSEIS (Stockhausen et al., 2011). The catch taken in 2010 (3,636 t) was less than the ABC (9,729 t). While larger than the catch taken in 2002 (3,000 t; 2004 PSEIS, Section 4.9.1.10), the catch in 2010 was also well below the ABC, indicating that the stock continues to be only lightly exploited. Qualitatively, then, it seems almost certain that the status of the resource has not changed since the 2004 PSEIS.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Yes. Estimates of current total biomass and spawning biomass, as well as age and size composition, were not available for GOA rex sole in the 2004 PSEIS. Estimates of these quantities are now available (Stockhausen et al., 2011).

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Yes. Subsequent to the 2004 PSEIS, an age-structured assessment model was developed for GOA rex sole. This model provides time series estimates of total and spawning stock biomass. Current year estimates of total and spawning stock biomass are both currently at high levels relative to estimates for 2004.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The GOA rex sole stock is lightly exploited and similar conclusions would be reached with the current methods as were reached in the 2004 PSEIS.

**Citations**

NPFMC. 2012. Fishery Management Plan for Groundfish of the Gulf of Alaska: Appendices. [http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA\\_appdcs.pdf](http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA_appdcs.pdf)

Stockhausen, W. M.E. Wilkins and M.H. Martin. 2011. Chapter 6: Assessment of the Rex Sole Stock in the Gulf of Alaska. *In*: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska Region. North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, Alaska 99510. <http://www.afsc.noaa.gov/REFM/docs/2011/GOArex.pdf>

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? **BSAI Pacific ocean perch (POP)**

What sections of the PSEIS were reviewed? **Section 4.9.1.11**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The management several BSAI trawl fisheries changed in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. The partitioning of TAC among cooperatives has allowed fishing for POP to occur more gradually throughout the year.

### 2 Has the status of the resource changed?

The estimated biomass of the BSAI Pacific ocean perch stock has approximately doubled since the 2004 stock assessment, due to high recent survey biomass estimates and evidence of relatively large recent year classes.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There is new scientific information indicating that the population structure for Pacific ocean perch may be at a smaller spatial scale (70 – 400 km; Palof et al. 2011) than the spatial scale for defining the stock or spatially allocating the ABC, which could potentially lead to reductions in yield and biomass if harvest was spatially disproportionate to biomass.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

In 2010, a Plan Team –SSC stock structure committee developed a template for evaluating the types of information to be considered when defining the spatial bounds of “stocks” (Spencer et al 2010). Part of this template consists of evaluating spatial harvest patterns and whether disproportionate spatial harvesting patterns, if they exist, pose concerns regarding the impact of the fishery within management subareas.

## 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

The stock structure template has not been applied to BSAI POP, in part because the ABC for this stock has a higher degree of spatial partitioning than other BSAI rockfish stocks, which have thus received higher priority for application of the template. Given the sharp rise in biomass in recent years (which has occurred across all spatial subareas), it appears unlikely that conclusions from 2004 PSEIS would be affected from the new information. A full analysis of the impact of disproportionate harvest on yield and biomass for stock stocks which exhibit spatial structure would require population models that accounted for connectivity of populations of fish between subareas, and would be more complex than the models used for the 2004 PSEIS. However, work has begun on developing these types of models to simulate the types of impacts of disproportionate harvesting upon yield and stock size (I. Spies, AFSC, in prep).

### References

- Palof, K.J., J. Heifetz, and A.J. Gharrett. 2011. Geographic structure in Alaskan Pacific ocean perch (*Sebastes alutus*) indicates limited lifetime dispersal. *Mar. Biol.* 158:779-792.
- Spencer, P., M. Canino, J. DiCosimo, M. Dorn, A.J. Gharrett, D. Hanselman, K. Palof, and M. Sigler. 2010. Guidelines for determination of spatial management units for exploited populations in Alaskan fishery groundfish management plans. Paper prepared for the September 2010 NPFMC Plan Team meeting.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? **BSAI Northern rockfish**  
What sections of the PSEIS were reviewed? **Section 4.9.1.13**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The management several BSAI trawl fisheries changed in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. BSAI northern rockfish are harvested largely as bycatch in the Atka mackerel fishery, which has been affected by Amendment 80. In 2010, the western Aleutian Islands subarea was closed for harvesting Atka mackerel, which has substantially reduced northern rockfish harvest in this area.

### 2 Has the status of the resource changed?

Northern rockfish were classified in Tier 5 when analysis for the 2004 PSEIS occurred, so status relative to stock size reference points were not available at that time. Beginning in 2004, northern rockfish have been classified in Tier 3 and an age-structure model has been used for their assessment. The estimated stock size has been relatively flat since 2000, with the stock size exceeding  $B_{40\%}$  and the fishing mortality rates less than  $F_{40\%}$ .

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There is new scientific information indicating that the population structure for BSAI northern rockfish may be at a smaller spatial scale (100 – 200 km; Gharrett et al. 2012) than the spatial scale for defining the stock or spatially allocating the ABC, which could potentially lead to reductions in yield and biomass if harvest was spatially disproportionate to biomass.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

In 2010, a Plan Team –SSC stock structure committee developed a template for evaluating the types of information to be considered when defining the spatial bounds of “stocks” (Spencer et al. 2010). Part of this template consists of evaluating spatial harvest patterns and whether disproportionate spatial harvesting patterns, if they exist, pose concerns regarding the impact of the fishery within management subareas. This template was applied to BSAI northern rockfish in 2012, and indicated that disproportionate harvesting has occurred in some years in the central and eastern Aleutian Islands (Appendix A in Spencer and Ianelli 2012).

## 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

The 2004 PSEIS evaluated the impact of spatial concentration of the catch with respect to, in part, reductions in “genetic diversity”. Given that reductions in genetic diversity would be expected to occur at very low stock sizes, it is not clear that the conclusions from the 2004 PSEIS using this criterion would be affected from new information on stock structure. However, in developing the stock structure template, Spencer et al. (2010) focused on the potential loss of biomass and yield that may occur from harvests that are spatially disproportionate for biomass for stocks that exhibit spatial structure. Under this criterion, it would be expected that consistent disproportionate spatial harvesting would be expected to result in reductions of biomass and yield in subareas with high exploitation rates. A full analysis of these impacts would require population models that accounted for connectivity of populations of fish between subareas, and would be more complex than the models used for the 2004 PSEIS. However, work has begun on developing these types of models to simulate the types of impacts of disproportionate harvesting upon yield and stock size (I. Spies, AFSC, in prep).

In 2013, a workshop was held to discuss how information on stock structure could be used to inform management decisions, with consideration to a variety of risks to the underlying stock and the resource users. The report from this workshop will hopefully provide some guidance for how to evaluate our management policy for stocks like BSAI northern rockfish, which exhibit stock structure at spatial scales smaller than our current management units, and have occasionally shown disproportionate harvesting patterns.

### References

- Gharrett, A.J., R.J. Riley, and P.D. Spencer. 2012. Genetic analysis reveals restricted dispersal of northern rockfish along the continental margin of the Bering Sea and Aleutian Islands. *Trans. Am. Fish. Soc.* 141:370-382.
- Spencer, P.D., and J.N. Ianelli. 2012. Assessment of the northern rockfish stock in the eastern Bering Sea and Aleutian Islands. In *Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands regions*, pp. 1349-1422. North Pacific Fishery Management Council, 605 W. 4th Ave, suite 306. Anchorage, AK 99501.
- Spencer, P., M. Canino, J. DiCosimo, M. Dorn, A.J. Gharrett, D. Hanselman, K. Palof, and M. Sigler. 2010. Guidelines for determination of spatial management units for exploited populations in Alaskan fishery groundfish management plans. Paper prepared for the September 2010 NPFMC Plan Team meeting.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? **BSAI Shortraker rockfish**  
 What sections of the PSEIS were reviewed? *Section 4.9.1.13*

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 **Has management of the resource changed?**

Shortraker rockfish are harvested as bycatch in other target fisheries, primarily the BSAI POP fishery. The management of the BSAI POP, and several other BSAI trawl fisheries, changed in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. These management changes have affected the seasonal distribution of harvest, with relatively more harvest occurring in the fall than in previous years.

Additionally, BSAI shortraker rockfish were managed as part of the BSAI rougheye/shortraker species complex when the 2004 PSEIS was completed, and are now managed within their own single-species management category.

### 2 **Has the status of the resource changed?**

Shortraker rockfish are managed under Tier 5, and the 2004 PSEIS states that reliable estimates of total and spawning biomass are not available. However, estimates of biomass are obtained from the Tier 5 stock assessments, and are based on smoothing survey biomass estimates. The estimated biomass for 2012 (17,000 t) is a slight decrease from the estimate for 2004 (20,000 t).

### 3 **Is there new information regarding the impacts of the groundfish fisheries on the resource?**

There is no new information regarding the impacts of the groundfish fisheries on BSAI shortraker rockfish.

### 4 **Are there new methods of analysis or protocols for evaluating impacts?**

In 2010, a Plan Team –SSC stock structure committee developed a template for evaluating the types of information to be considered when defining the spatial bounds of “stocks” (Spencer et al 2010). Part of this template consists of evaluating spatial harvest patterns and whether disproportionate spatial harvesting patterns, if they exist, pose concerns regarding the impact of the fishery within management subareas. This template is scheduled to be applied to BSAI shortraker rockfish in 2013.

## **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

The 2004 PSEIS evaluated the impact of spatial concentration of the catch with respect to, in part, reductions in “genetic diversity”. Given that reductions in genetic diversity would be expected to occur at very low stock sizes, it is not clear that the conclusions from the 2004 PSEIS using this criterion would be affected from new information on stock structure. However, in developing the stock structure template, Spencer et al. (2010) focused on the potential loss of biomass and yield that may occur from harvests that are spatially disproportionate for biomass for stocks that exhibit spatial structure. Under this criterion, it would be expected that consistent disproportionate spatial harvesting for stocks with spatial structure would be expected to result in reductions of biomass and yield. Limited genetic samples currently exist for BSAI shortraker rockfish.

In 2013, a workshop was held to discuss how information on stock structure could be used to inform management decisions, with consideration to a variety of risks to the underlying stock and the resource users. The report from this workshop will hopefully provide some guidance for how to evaluate our management policy for BSAI rockfish.

### **References**

Spencer, P., M. Canino, J. DiCosimo, M. Dorn, A.J. Gharrett, D. Hanselman, K. Palof, and M. Sigler. 2010. Guidelines for determination of spatial management units for exploited populations in Alaskan fishery groundfish management plans. Paper prepared for the September 2010 NPFMC Plan Team meeting.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? **BSAI Blackspotted/rougheye rockfish**  
What sections of the PSEIS were reviewed? *Section 4.9.1.13*

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

Blackspotted/rougheye rockfish are harvested as bycatch in other target fisheries, primarily the BSAI POP fishery. The management of the BSAI POP, and several other BSAI trawl fisheries, changed in 2008 with the implementation of Amendment 80 to the BSAI Fisheries Management Plan. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. These management changes have affected the seasonal distribution of harvest, with relatively more harvest occurring in the fall than in previous years. However, in 2010 the western Aleutian Islands was closed for harvesting Atka mackerel, and many of the vessels that target Atka mackerel also target POP. This has resulted in harvesting of western Aleutian Islands POP, and thus the bycatch of blackspotted/rougheye, primarily during the summer in recent years in this subarea.

Additionally, BSAI blackspotted/rougheye rockfish were managed as part of the BSAI rougheye/shorthead species complex when the 2004 PSEIS was completed, and are now managed within their own management category. Fish formerly referred to as rougheye rockfish were found to comprise two species, with the new species blackspotted rockfish being identified. Finally, in 2010 the BSAI ABC for blackspotted/rougheye was partitioned between a Western and Central AI ABC, and an Eastern AI and EBS ABC.

### **2 Has the status of the resource changed?**

Blackspotted/rougheye rockfish were classified in Tier 5 when analysis for the 2004 PSEIS occurred, so status relative to stock size reference points were not available at that time. Beginning in 2009, blackspotted/rougheye rockfish have been classified in Tier 3 and an age-structure model has been used for their assessment. The estimated BSAI stock size has increased since 2000, based largely upon the age and size composition data indicating relatively strong recent year classes.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

There is new scientific information indicating that the population structure for BSAI blackspotted rockfish may be at a smaller spatial scale (< 500 km; Appendix A in Spencer and Rooper 2010) than the spatial scale of the BSAI area, and this information led to the partitioning the ABC within the BSAI. Subsequent analyses (Appendix A in Spencer and Rooper 2012) have revealed disproportionate

harvesting and a consistent pattern of high exploitation rates in the western Aleutian Islands that exceed those corresponding to the  $F_{40\%}$  reference points. Since 2004, approximately 43% of the Aleutian Islands blackspotted/rougheye harvest has occurred in the western Aleutian Islands, an area with approximately 8% of the AI survey biomass. A decline in the western AI survey biomass has occurred since the early 1990s; each of the biomass estimates from 2000 – 2010 (averaging 1,059 t) is below each of the biomass estimates from 1991-1997 (averaging 3,156 t), and the 2012 survey estimate has declined to 335 t, the lowest value on record for this subarea.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

In 2010, a Plan Team –SSC stock structure committee developed a template for evaluating the types of information to be considered when defining the spatial bounds of “stocks” (Spencer et al. 2010). This template was applied to BSAI blackspotted/rougheye rockfish in 2010, and documents existing genetic information that indicates that the spatial structure is estimated to not exceed ~ 500 km. Additional analyses (Appendix A in Spencer and Rooper 2012) have generated area-specific exploitation rates, and reference exploitation rates that correspond harvesting at  $F_{40\%}$ .

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

The 2004 PSEIS evaluated the impact of spatial concentration of the catch with respect to, in part, reductions in “genetic diversity”. Given that reductions in genetic diversity would be expected to occur at very low stock sizes, it is not clear that the conclusions from the 2004 PSEIS using this criterion would be affected from new information on stock structure. However, in developing the stock structure template, Spencer et al. (2010) focused on the potential loss of biomass and yield that may occur from harvests that are spatially disproportionate to biomass for stocks that exhibit spatial structure. Under this criterion, it would be expected that consistent disproportionate spatial harvesting would be expected to result in reductions of biomass and yield in subareas with high exploitation rates. A full analysis of these impacts would require population models that accounted for connectivity of populations of fish between subareas, and would be more complex than the models used for the 2004 PSEIS. However, work has begun on developing these types of models to simulate the types of impacts of disproportionate harvesting upon yield and stock size (I. Spies, AFSC, in prep).

In 2013, a workshop was held to discuss how information on stock structure could be used to inform management decisions, with consideration to a variety of risks to the underlying stock and the resource users. The report from this workshop will hopefully provide guidance for how to evaluate our management policy for stocks like BSAI blackspotted/rougheye rockfish, which exhibit: 1) stock structure at spatial scales smaller than our current management units; 2) disproportionate harvesting patterns and high subarea exploitation rates; and 3) declines in subarea population abundance.

#### **References**

- Spencer, P.D., and C.N. Rooper. 2012. Assessment of the blackspotted and rougheye rockfish complex in the eastern Bering Sea and Aleutian Islands. In Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands regions, pp. 1423-1496. North Pacific Fishery Management Council, 605 W. 4th Ave, suite 306. Anchorage, AK 99501
- Spencer, P.D., and C.N. Rooper. 2010. Assessment of the blackspotted and rougheye rockfish complex in the eastern Bering Sea and Aleutian Islands. In Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands region as projected for 2011, pp.

1127-1194. North Pacific Fishery Management Council, 605 W. 4th Ave, suite 306. Anchorage, AK 99501

Spencer, P., M. Canino, J. DiCosimo, M. Dorn, A.J. Gharrett, D. Hanselman, K. Palof, and M. Sigler. 2010. Guidelines for determination of spatial management units for exploited populations in Alaskan fishery groundfish management plans. Paper prepared for the September 2010 NPFMC Plan Team meeting.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/13

What resource component is this review for? **BSAI other rockfish**

What sections of the PSEIS were reviewed? **Section 4.9.1.13**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

Since the 2004 PSEIS, there has not been substantial management changes that has affected BSAI Other Rockfish.

### **2 Has the status of the resource changed?**

BSAI Other Rockfish are managed under Tier 5, and the 2004 PSEIS states that reliable estimates of total and spawning biomass are not available. However, estimates of biomass are obtained from the Tier 5 stock assessments, and are based on smoothing survey biomass estimates. The AI survey biomass estimate for Other Rockfish in 2012 is similar to estimates in the early 2000s, whereas the estimates from the EBS slope survey have increased from 17,000 t in 2002 to 30,000 t in 2012.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

There is no new information regarding the impacts of the groundfish fisheries on BSAI Other Rockfish.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

There are no new methods for evaluating fishery impacts upon BSAI Other Rockfish.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Given the criteria used for the 2004 PSEIS and the absence of new information for BSAI Other Rockfish, it is unlikely that a reanalysis would yield a seriously different conclusion regarding the impact to the stock.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6/13/13*

What resource component is this review for? \_\_\_ Gulf of Alaska Pacific ocean perch  
 What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.11

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July. In a comparison of catches in the four years before the RPP to the four years after, it appears some effort has shifted to area 620 (Chirikof) from area 630 (Kodiak).

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

### 2 Has the status of the resource changed?

The status of the GOA Pacific ocean perch stock is similar to the status during the 2004 PSEIS and within the range of variability of the estimates at that time.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Use of pelagic trawl gear has increased gradually over time and is now 31% of effort for POP in the Gulf of Alaska (GOA POP SAFE, Hanselman et al. 2011). This should reduce any potential effects of the POP fishery on habitat suitability for GOA POP. Several genetic analyses of POP stock structure have suggested that POP are at risk of localized depletion because of very low estimated lifetime movement potential. However, an analysis of localized depletion using fishery catch-per-unit effort data showed that large areas filled back in with similar amounts of fish in subsequent years. The rockfish fishery, which is the main source of mortality for GOA POP, is prosecuted over a longer period of time.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The stock assessment and projection models are similar to those used in the PSEIS.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The previous analysis in the 2004 PSEIS was based on the standard projection model which is still used, and the stock assessment that the projection was based on is similar to the one used now.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6/13/13*

What resource component is this review for? \_\_\_ Gulf of Alaska northern rockfish  
 What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July. In a comparison of catches in the four years before the RPP to the four years after, it appears that average catches have increased overall (although, this may be due to increased observer coverage) and have spread out spatially in the western and central Gulf.

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

### 2 Has the status of the resource changed?

The status of the GOA northern rockfish stock is similar to the status during the 2004 PSEIS and within the range of variability of the estimates at that time.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Use of pelagic trawl gear has increased gradually over time in the Gulf of Alaska (GOA Northern rockfish SAFE, Huslon et al. 2011). This should reduce the chance for any effects on habitat suitability from the GOA northern rockfish fishery.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The methodology is similar to the 2004 PSEIS.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current analysis uses modern methods and the Gulf of Alaska northern rockfish assessment model indicates that the conclusions of the 2004 PSEIS are still valid.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/13/13

What resource component is this review for? \_\_\_ Gulf of Alaska shortraker rockfish  
What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July.

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

Starting in 2005, Gulf of Alaska shortraker rockfish was separated from the shortraker and rougheye rockfish complex. Shortraker is a stand-alone Tier 5 assessment because of its relatively high value, but is not able to be elevated to a higher tier, primarily because of uncertainty in the validity of age readings. There is no target fishery for shortraker rockfish, but they are retained in the Rockfish program and by longliners fishing sablefish.

### 2 Has the status of the resource changed?

Because the shortraker rockfish stock is in Tier 5, its stock status cannot be determined. As in the 2004 PSEIS, overfishing is not occurring for the GOA shortraker rockfish stock.

**3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Yes, the stock is now managed separately so catch is better accounted for and impact of the fishery can be is monitored more closely.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

There has been additional work on determining age compositions of shortraker rockfish and there is also potential to attempt length-based methods to be able to better assess stock status.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. Since the fishery is not opened as a target fishery, it is unlikely that a conservation concern has developed since the 2004 PSEIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6-13-13*

What resource component is this review for? \_\_\_ Gulf of Alaska rougheye/blackspotted rockfish  
 What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July.

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

Starting in 2004, shortraker and rougheye rockfish were divided into separate subgroups and assigned individual ABCs and TACs. In 2005, rougheye was moved to Tier 3 status as an age structured model was accepted for determining ABC and OFL. It can now be identified that overfishing is not occurring for this stock, and that the stock is not overfished. In 2008, the rougheye rockfish was formally identified as a complex of two sibling species called rougheye (*Sebastes aleutianus*) and blackspotted (*S. melanostictus*) rockfish. They continue to be assessed as a Tier 3 stock complex.

### 2 Has the status of the resource changed?

Because the rougheye and blackspotted complex is in Tier 3, it can now be identified that overfishing is not occurring, and the stock is not overfished. This status would have been unknown during the 2004 PSEIS.

**3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Yes, the complex is now managed separately from shortraker rockfish so catch is better accounted for and impact of the fishery can be monitored more closely.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The 2004 PSEIS used a projection model for Tier 3 stocks. The rougheye/blackspotted assessment is now an age-structured stand-alone assessment in Tier 3, so impacts of the fishery on the resource can be better monitored and the 2004 projection analysis could be repeated including the RE/BS complex.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Yes. The change in biomass category could be changed from “unknown” to “insignificant” for both direct/indirect and cumulative effects.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6/13/13*

What resource component is this review for? \_\_\_ Gulf of Alaska dusky rockfish  
 What sections of the PSEIS were reviewed? \_\_\_ 4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July. In a comparison of catches in the four years before the RPP to the four years after, it appears that average catches have increased overall (although, this may be due to increased observer coverage) and have spread out spatially in the western and central Gulf.

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, roughey/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

For 2012, widow and yellowtail rockfish were removed from the pelagic shelf rockfish complex effectively leaving dusky rockfish as a stand-alone Tier 3 species. Widow and yellowtail rockfish were moved to a new “Other rockfish” category with the old “Slope rockfish” category species. Because dusky rockfish is in Tier 3, it can now be identified that overfishing is not occurring, and the stock is not overfished.

### 2 Has the status of the resource changed?

Because dusky rockfish is in Tier 3, it can now be identified that overfishing is not occurring, and the stock is not overfished. This status would have been unknown during the 2004 PSEIS.

**3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Bycatch estimates decreased for the majority of species in the Central GOA following the implementation of the Rockfish Pilot Program. Use of pelagic trawl gear has increased gradually over time in the Gulf of Alaska (GOA dusky rockfish SAFE, Lunsford et al. 2011). This should reduce the chance for any effects on habitat suitability from the GOA dusky fishery.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

The 2004 PSEIS used a projection model for Tier 3 stocks. The dusky rockfish assessment is now an age-structured stand-alone assessment in Tier 3, so impacts of the fishery on the resource can be better monitored and the 2004 projection analysis could be repeated including the GOA dusky rockfish stock.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Yes. The change in biomass category could be changed from “unknown” to “insignificant” for both direct/indirect and cumulative effects.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 3/13/14

What resource component is this review for? Demersal Shelf Rockfish  
 What sections of the PSEIS were reviewed? 4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

In 1998 the NPFMC passed an amendment to require full retention of DSR in federal waters. Seven years later, in mid-season 2005, the final rule was published and fishermen must now retain and report all DSR caught in federal waters; any poundage above the 10% bycatch allowance may be donated or kept for personal use but may not enter commerce. The requirement for full retention of rockfish in both federal and state waters allows for better accounting of total mortality.

In 2006 the Alaska Board of Fisheries implemented a regulation to allocate the DSR Total Allowable Catch (TAC) as follows: 16% to the recreational fishery, and 84% to the commercial fisheries.

In 2009, the Alaska Board of Fisheries implemented a regulation that required the estimated harvest of DSR subsistence catch to be deducted from the acceptable biological catch (ABC) of DSR prior to allocation of the TAC.

### 2 Has the status of the resource changed?

As in 2004, DSR remains in Tier 4, thus stock status cannot be determined. As in the 2004 PSEIS, overfishing is not occurring for the DSR. However, survey estimates have indicated a decline in population biomass despite the continued use of a harvest rate lower than the maximum allowed under Tier 4. Under Tier 4 definitions for setting ABC,  $F_{40\%}=0.026$  would be used, but we continue to use a more conservative approach ( $F=M=0.02$ ).

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

A large proportion of the DSR total mortality is from bycatch in the IFQ halibut fishery. Decreasing halibut quotas in area 3A and 2C have reduced the DSR bycatch in these fisheries as well. New information from the expanded observer program may shed light on whether the full retention rockfish regulation is being complied with.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Historically, and at the time of the 2004 PSEIS, the R/V *Delta*, a manned submersible, was used to assess DSR during line transect surveys. Since 2012, the submersible has been replaced with a Remote Operated Vehicle (ROV) since the *Delta* is no longer available for charter. We are using the same survey

techniques and survey design with the new vehicle, however we will be including both the submersible and ROV data survey estimates, total catch, and biological data into an age structured assessment (ASA) model is for the 2014 assessment cycle. If this ASA model is accepted it is likely the DSR complex would be moved to Tier 3 and impacts of the fishery on the resource can be better assessed. The ROV is outfitted with a pair of stereo cameras, which allows us to record fish length from the survey, which was previously unavailable.

Also, additional habitat mapping has been conducted since 2004 which allows us to better refine our rockfish habitat estimation.

## **5      Would a new analysis using the latest methods and information reach a seriously different conclusion?**

The current analyses indicates that the conclusions of the 2004 PSEIS are still valid, however if DSR are moved to a different Tier status after review of the ASA model in 2014, then it is possible that the Category “change in biomass level” could change from unknown to a different rating.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6/13/13*

What resource component is this review for?      Gulf of Alaska thornyhead rockfish complex  
 What sections of the PSEIS were reviewed?      4.9.1.12

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July. In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

Starting in 2004, Gulf of Alaska thornyhead rockfish complex was downgraded from Tier 3 to Tier 5, primarily because of uncertainty in the validity of age readings for shortstpine thornyhead . There is no target fishery opened for thornyhead rockfish, but they are retained in the Rockfish program and by longliners targeting sablefish.

### **2 Has the status of the resource changed?**

Because the thornyhead complex is now in Tier 5, it can no longer be identified whether the stock is overfished. For 2004 PSEIS, the thornyhead complex was identified as not overfished.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

No.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

There has been additional tag recovery data collected and there is potential to attempt length-based methods to be able to better assess stock status.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

Yes. Since the fishery is now a tier 5 stock the conclusions reached for the categories **change in biomass, spatial/temporal concentration of catch-change in genetic structure, spatial/temporal concentration of catch-change in reproductive success, change in prey availability, and change in habitat** would be moved from a finding of “Insignificant” to a finding of “Unknown”. However, it is unlikely that a conservation concern has developed since the 2004 PSEIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 6/13/13*

What resource component is this review for?      Gulf of Alaska other rockfish  
 What sections of the PSEIS were reviewed?      4.9.1.13

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

In November, 2006, NMFS issued a final rule to implement Amendment 68 of the GOA groundfish Fishery Management Plan for 2007 through 2011. This action implemented the Central GOA Rockfish Pilot Program (RPP). The intention of this program is to enhance resource conservation and improve economic efficiency for harvesters and processors in the rockfish fishery. This should spread out the fishery in time and space, allowing for better prices for product and reducing the pressure of what was an approximately two week fishery in July.

In 2012 this was implemented permanently as the Rockfish Program. The Rockfish Program assigns quota shares for primary rockfish species and secondary target species. Primary rockfish species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish (now dusky rockfish). Secondary target species are Pacific cod, rougheye/blackspotted rockfish, shortraker rockfish, sablefish, and thornyhead rockfish. Each year the quota shares are assigned to a rockfish cooperative. Each rockfish cooperative receives an annual cooperative fishing quota, which is an amount of primary and secondary rockfish species the cooperative is able to harvest in that fishing year. Halibut Prohibited Species Catch is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving rockfish quota share must be located within the boundaries of the City of Kodiak. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year, whereas in the past, a very short season in July was prosecuted.

Starting in 2012, Gulf of Alaska “Slope rockfish” and the remainder of the “Pelagic shelf rockfish” complex after removing dusky rockfish were reorganized under a new management group called “Other Rockfish”. This group is a catch-all for the remainder of Gulf of Alaska rockfish that are in Tiers 4 and 5. There is a range of life history variants in this complex, and the complex composition changes over geographic clines.

### **2 Has the status of the resource changed?**

Because the other rockfish complex has stocks in Tiers 4 and 5, its stock status cannot be determined. As in the 2004 PSEIS of “Slope rockfish”, overfishing is not occurring for the GOA other rockfish stock complex.

**3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Improvements in the observer program and catch accounting have yielded better estimates of minor rockfish species catches.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

Data for most “other rockfish” species is sparse and survey biomass estimates are too imprecise to further develop new more detailed assessments.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. Since the fishery is not opened as a target fishery, it is unlikely that a conservation concern has developed since the 2004 PSEIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

~6/19/2013

What resource component is this review for? GOA & BSAI squids  
 What sections of the PSEIS were reviewed? 4.9.3

### 1 Has management of the resource changed?

Management of squids in the BSAI has not changed since 2004; they continue to be managed as a separate stock. In the GOA, squids are now also managed as a separate stock as a result of NPFMC Amendment 87 (<http://www.fakr.noaa.gov/sustainablefisheries/amds/95-96-87/amd87.pdf>). In both the BSAI and GOA, squids are managed under Tier 6. The OFL in the BSAI is the average catch from 1978-1995; the OFL in the GOA is the maximum catch during 1997-2007.

### 2 Has the status of the resource changed?

As described in the 2004 PSEIS (section 3.5.3.1), very little information is available regarding the status of squid populations. Catches of squids have been relatively low since 2013 in both areas, but this likely reflects fishery behavior rather than changes in abundance.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Beginning in 2009, the fishery observer program records lengths of squids caught incidentally in groundfish fisheries. This has allowed a better understanding of which species/ life stages are most likely to be caught incidentally. Otherwise, the assessment of impacts in the PSEIS remains unchanged.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

The development of ecosystem models for the BSAI and GOA has allowed greater exploration of how various ecosystem impacts might affect squid stocks and their predators. In addition, the establishment of a separate squid complex in the GOA allows an evaluation of whether overfishing is occurring.

### 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

It is unlikely that a new analysis would reach a seriously different conclusion. It is likely that many of the potential benefits of Preferred Alternative 2 (which included separate specifications for species groups within the “Other Species” group) will be realized under the new management approach in the GOA.

## PSEIS SIR – review of conclusions in 2004 PSEIS

~6/19/2013

What resource component is this review for? **BSAI and GOA Octopus** \_\_\_\_\_

What sections of the PSEIS were reviewed? **4.9.3 Other Species**, including

- **Table 4.1-1 for Significance rating criteria for target species, other species\*, forage fish, non-specified species, Pacific halibut, and Pacific herring**
- **Table 4.9-2 Significance ratings for prohibited, other\*, forage, and non-specified species under Preferred Alternative PA.1 and PA.2**
- **Table 4.10-2b PA.1 and PA.2-impacts of Preferred Alt example FMP bookends**

### 1 Has management of the resource changed?

There have been substantial changes in management and monitoring of this species assemblage. The “other species” group has been removed from the FMP and replaced with separate regulation for sculpins, sharks, squids, skates, and octopus. The octopus complex, which includes all species of octopus, is now managed as a separate category in the FMPs and has its own annual OFL, ABC, and TAC limits. This management change was implemented in both the BSAI and GOA in 2012. Separate catch accounting for the octopus assemblage has been conducted since 2003. Identification of octopus on AFSC bottom trawl surveys has been improved to the species level, and more data has been collected on size ranges (in weight) of the different species. Identification of octopus in observer and fish ticket data is still collected at the assemblage level (all octopus), but special projects have provided data that indicate that the majority of the commercial catch is one species, *Enteroctopus dofleini*, which is used as the indicator species for the assemblage.

It is unknown whether this management change has affected the resource. Both reporting rates of incidental catch and retention of catch for sale and bait are believed to have increased over the period 2004-2012, but overall incidental catch rates are still believed to be very low in relation to population biomass (see BSAI and GOA SAFEs).

### 2 Has the status of the resource changed?

No. The status of the resource is still unknown, as listed for the entire “other species” complex in 2004 (Table 9.4-2). While knowledge of the indicator species has improved since 2004, there is still no reliable estimate of biomass for the assemblage or time series of abundance indicators. There is still little information on overall mortality or on changes in biomass, habitat, reproductive success, or genetic structure.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There is substantial new information about the biology of the indicator species for the assemblage, due to completed and ongoing directed research (see the BSAI and GOA Octopus SAFE; NPRB projects 906, 1005, and 1203; and NOAA Cooperative research projects for 2009, 2012, and 2013). None of the new information suggests any change in effects of the fishery on the resource, as fishery practices have changed only slightly since the mid- 1990s (there is no directed fishing for octopus). Since the status of the resource is unknown, the effect of the fishery on the resource remains unknown.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

Recent information on the discard mortality of octopus suggests that current catch accounting practices (100% mortality assumed) are highly conservative for this assemblage, which would suggest that impacts of the fishery on the resource have been overestimated. This is true for both the period of review for the 2004 PSEIS and the period 2004-2013. In both cases, there is no reason to expect any increase in fishery impacts on the assemblage since 2004

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. Since the status of the resource is unknown, the effect of the fishery on the resource remains unknown. If new information on discard mortality were used, the estimated fishing mortality of the assemblage would be reduced, but the overall mortality rate for the assemblage is still unknown.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/12/13

What resource component is this review for? \_\_\_**Sharks**

What sections of the PSEIS were reviewed? \_\_\_**Section 4.9.3**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 **Has management of the resource changed?**

As part of the reauthorization of the Magnuson Stevens Fishery Conservation and Management Act, the NPFMC passed amendment 87 (<http://www.fakr.noaa.gov/sustainablefisheries/amds/95-96-87/amd87.pdf>), which dissolved the Other Species Complex. Sharks are now managed as a separate complex. The effect of this is that the shark complex has a separate ABC set for it.

### 2 **Has the status of the resource changed?**

The status of the shark complex in the PSEIS was determined to be unknown. Currently, the shark complex is composed of Tier 6 species and the status of the stock cannot be determined. As in the 2004 PESIS of Other Species/Sharks, overfishing is not occurring in either the GOA or BSAI shark stocks.

### 3 **Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Yes, the sharks are now a separate complex. Restructuring of the observer program (which began in 2013) improved observer coverage of fisheries that encounter sharks and will likely result in better catch accounting of this complex.

### 4 **Are there new methods of analysis or protocols for evaluating impacts?**

At the time of the 2004 PSEIS the shark stock assessments were based only on catch history. Now, spiny dogfish (*Squalus suckleyi*) is assessed using survey biomass. Modeling methods are being evaluated for spiny dogfish to better assess the status of the stock.

### 5 **Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The previous status of the sharks was “unknown”. The shark complex is on a bycatch only status and it is unlikely that a conservation concern has developed since the 2004 PESIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/10/2013

What resource component is this review for? **BSAI sculpins**  
 What sections of the PSEIS were reviewed? **Section 4.9.3**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Historically, sculpins have been managed as part of the BSAI Other Species complex (sculpins, skates, sharks, and octopus). Specifications for this group were set by summing the individual ABCs and OFLs for each species group to create an aggregate OFL, ABC, and TAC. In 2010, the North Pacific Fishery Management Council passed amendment 87 to the BSAI Fishery Management Plan, which separated the Other Species complex into its constituent species groups. Since that time, BSAI sculpins have been managed as an independent complex with its own harvest specifications.

### 2 Has the status of the resource changed?

The status of the BSAI sculpin complex is similar to the status during the 2004 PSEIS, based on research survey estimates. The sculpin complex in the BSAI includes 48 species, but the six of the largest species comprise over 85% of the total sculpin biomass (bigmouth (*Hemitripteris bolini*), great (*Myoxocephalus polyacanthocephalus*), plain (*Myoxocephalus jaok*), threaded (*Gymnocanthus pistilliger*), warty (*Myoxocephalus verrucosus*), and yellow Irish lord (*Hemilepidotus jordani*)). These six species are also assumed to have higher catchabilities than the remaining species because smaller species are likely to pass through the net and are difficult to assess in NMFS research surveys. Estimates of the abundance of each of these species, as well as the overall sculpin complex biomass, have not changed significantly since 2004.

### 2 Is there new information regarding the impacts of the groundfish fisheries on the resource?

BSAI sculpins were not assessed as a separate complex until 2010. Information on the impact of the groundfish fisheries on the resource comes directly from observer data. Two analyses performed on survey data and observer data were highly consistent: 1. length frequencies and 2. relative abundance of each species relative to the total sculpin abundance of the six species, specifically bigmouth (*Hemitripteris bolini*), great (*Myoxocephalus polyacanthocephalus*), plain (*Myoxocephalus jaok*), threaded (*Gymnocanthus pistilliger*), warty (*Myoxocephalus verrucosus*), and yellow Irish lord (*Hemilepidotus jordani*). This suggests that data used in the assessment accurately captures the impacts of the groundfish fisheries on this resource.

### 3 Are there new methods of analysis or protocols for evaluating impacts?

Since 2010 the sculpin stock assessment has been performed under Tier 5 methodology, and protocols have remained consistent for the 2010-2012 assessments.

**4 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current assessment uses a weighted average of sculpin survey biomass from the past three years in which all three BSAI surveys were performed. Alternative methods were explored, including a weighted average of the most three recent years of each survey and a random effects model, but the resulting ABC and TAC were not significantly different than that achieved with the current methodology.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/10/2013

What resource component is this review for? **GOA sculpins**  
 What sections of the PSEIS were reviewed? **Section 4.9.3**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Historically, sculpins have been managed as part of the GOA Other Species complex (sculpins, skates, sharks, squid, and octopus). Specifications for this group were set by summing the individual ABCs and OFLs for each species group to create an aggregate OFL, ABC, and TAC. In 2010, the North Pacific Fishery Management Council passed amendment 87 to the GOA Fishery Management Plan, which separated the Other Species complex into its constituent species groups. Since that time, GOA sculpins have been managed as an independent complex with its own harvest specifications.

### 2 Has the status of the resource changed?

The status of the GOA sculpin complex is similar to the status during the 2004 PSEIS, based on research survey estimates. The sculpin complex in the GOA includes 48 species, but the four largest species comprise over 95% of the total sculpin biomass (bigmouth (*Hemitripteris bolini*), great (*Myoxocephalus polyacanthocephalus*), plain (*Myoxocephalus jaok*), and yellow Irish lord (*Hemilepidotus jordani*)). These four species are also assumed to have higher catchabilities than the remaining species because smaller species are likely to pass through the net and are difficult to assess in NMFS research surveys. Estimates of the abundance of each of these species, as well as the overall sculpin complex biomass, have not changed significantly since 2004.

### 2 Is there new information regarding the impacts of the groundfish fisheries on the resource?

GOA sculpins were not assessed as a separate complex until 2010. Information on the impact of the groundfish fisheries on the resource comes directly from observer data. Two analyses performed on survey data and observer data were highly consistent: 1. length frequencies and 2. relative abundance of each species relative to the total sculpin abundance of the four species, specifically bigmouth (*Hemitripteris bolini*), great (*Myoxocephalus polyacanthocephalus*), plain (*Myoxocephalus jaok*), and yellow Irish lord (*Hemilepidotus jordani*). This suggests that data used in the assessment accurately captures the impacts of the groundfish fisheries on this resource.

### 3 Are there new methods of analysis or protocols for evaluating impacts?

Since 2010 the sculpin stock assessment has been performed under Tier 5 methodology, and protocols have remained consistent for the 2010-2012 assessments.

**4 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The current assessment uses a weighted average of sculpin biomass from the past three years in which all three GOA surveys were performed. A random effects model was recently explored as an alternative to the current methodology, but the resulting ABC and TAC were not significantly different than currently estimated.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft ~6/19/2013

What resource component is this review for? BSAI skates  
 What sections of the PSEIS were reviewed? 4.9.3

### 1 Has management of the resource changed?

In 2011, the “Other Species” category was broken up and a separate skate complex was established (<http://www.fakr.noaa.gov/sustainablefisheries/amds/95-96-87/amd87.pdf>). A single set of harvest specifications is applied to the entire skate complex. Assessment of the Alaska skate (*Bathyraja parmifera*, which constitutes over 90% of the BSAI skate biomass) is achieved using an age-structured model, allowing a Tier 3 determination of harvest specifications for that species. The remaining skate species (“other skates”) are managed under Tier 5. The Tier 3 and Tier 5 specifications are combined to create a single skate complex set of specifications.

### 2 Has the status of the resource changed?

The 2004 PSEIS documented the difficulty of studying trends in the status of skate species in the BSAI, due to a general lack of biological information on skates and a specific lack of species identification for skates in the trawl survey before 2000 (PSEIS section 3.5.3.4). Skate biomass increased dramatically in the BSAI during the 1980s, and has since then remained relatively stable. Current survey methods and catch reporting allow enhanced monitoring of skate populations in the BSAI, but the conclusions in the PSEIS regarding the status of skates remain essentially unchanged.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

The fisheries that affect skates in the BSAI remain largely the same as in 2004. Skate catches likely depend mainly on the scale of the target fisheries where they are incidentally caught, i.e. the Pacific cod and flatfish fisheries.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

The changes in BSAI skate assessment and management allow an improved monitoring of skate stock status. The Alaska skate model permits an evaluation of both overfishing and whether the population is overfished; the Tier 5 status of “other skates” permits an evaluation of overfishing. The Alaska skate stock is not in an overfished condition and no skates have experienced overfishing since the new management measures were adopted.

### 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

The 2004 PSEIS listed the potential impacts on skate stocks (as part of “Other Species”) as “unknown”. It is likely that a new analysis would be able to provide a more detailed description of such impacts. However, due to the remaining uncertainties regarding bycatch and stock status, **it is unlikely that a new analysis would reach a seriously different conclusion.** It is likely that many of the potential benefits of Preferred Alternative 2 (which included separate specifications for species groups within the “Other Species” group) will be realized under the new management approach.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

~6/19/2013

What resource component is this review for? GOA skates

What sections of the PSEIS were reviewed? 4.9.3

### 1 Has management of the resource changed?

There have been numerous changes to the management of skates in the GOA since the PSEIS was published (see the 2011 GOA skate SAFE at [www.afsc.noaa.gov/refm/stocks/2011\\_assessments.htm](http://www.afsc.noaa.gov/refm/stocks/2011_assessments.htm)). In 2004, big skates (*Raja binoculata*) and longnose skates (*Raja rhina*) were moved to a separate management category and managed together under a single TAC in the Central GOA where a directed skate fishery had emerged in 2003. The remaining skates were managed as an “other skates” species complex in the Central GOA, and all skates including big and longnose skates were managed as a single skate complex in the Western and Eastern GOA. In 2005, the current management scheme was established:

- Big and longnose skates are each managed as single stocks, with harvest specifications for each stock.
- Separate ABCs and TACs for big and longnose skates are established for each GOA regulatory area.
- Big and longnose OFLs are established on a GOA-wide basis.
- The remaining skate species in the skate complex are managed as a single “other skates” stock, with GOA-wide specifications.
- Directed fishing is prohibited for all skate species in the GOA

### 2 Has the status of the resource changed?

The 2004 PSEIS documented the difficulty of studying trends in the status of skate species in the GOA, due to a general lack of biological information on skates and a specific lack of species identification for skates in the trawl survey before 2000 (PSEIS section 3.5.3.4). In general, skate species increased during the 1980s and the various populations have remained relatively stable since then. Current survey methods and catch reporting allow enhanced monitoring of skate populations in the GOA, but the conclusions in the PSEIS regarding the status of skates remain essentially unchanged.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

The fisheries that affect skates in the GOA remain largely the same as in 2004, with the exception that directed fishing for skates is currently prohibited. A small-scale state-waters fishery was conducted in 2009 & 2010, but has been discontinued. There continues to be interest in developing a directed skate fishery in the GOA. As described in the 2004 PSEIS, incidental catches of skates in the IPHC halibut fishery continue to be a large source of uncertainty regarding total skate catches. As described in the 2011 GOA skate SAFE, an analysis that applied IPHC longline survey species composition data to IPHC halibut catch records estimated a substantial amount of halibut fishery bycatch; however this analysis was deemed insufficient for inclusion in the official catch reporting. Changes to the fishery observer program implemented in 2013 will likely enhance the accounting of skate bycatch in the GOA. Other than those changes, the information regarding potential impacts on GOA skates remains unchanged from the 2004 PSEIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Draft 18 March 2014  
compiled by IPHC staff

What resource component is this review for? Pacific Halibut

What sections of the PSEIS were reviewed? \_\_\_\_\_

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

*The most significant change has been the implementation of (1) a license limited access program for the halibut sport guided (charter) fishery in IPHC Areas 2C (southeast Alaska) and 3A (southcentral Alaska) (2011), and (2) a Catch Sharing Plan between commercial and guided recreational halibut harvesters for Areas 2C and 3A, beginning in 2014. Management measures to restrict harvest within the guided sector included both size limits and daily effort controls.*

### 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

*The resource has declined from historic high levels in the late 1990s and is now near the long-term average abundance for the stock. The decrease in abundance is largely related to the passing through the stock of extremely strong cohorts generated in the late 1980s. Subsequent recruitments have been average to below-average, resulting in the stock returning to average levels. Current status is within the range of historic assessments.*

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

*Impacts of groundfish fisheries on the halibut resource are believed to have decreased since 2004, due to reductions in estimated halibut mortality in groundfish trawl fisheries. Most of this decline is associated with improved bycatch controls in the Bering Sea/Aleutian Islands Amendment 80 trawl fleet, through the use of fishery cooperatives, which include bycatch mortality pools. The International Pacific Halibut*

*Commission conducted additional analyses of the impacts of trawl bycatch mortality on lost yield and spawning biomass for the halibut stock.*

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

*The International Pacific Halibut Commission analyses referred to item 3 helped inform the reduction in halibut PSC limits for the Gulf of Alaska, scheduled for implementation over the 2014-2016 period. That information was included in the NEPA analysis conducted as part of GOA FMP Amendment 95.*

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

*No new information concerning bycatch impacts is currently available; however, the relationship of bycatch mortality to long-term yield from the halibut resource is currently being investigated within a Management Strategy Evaluation. It is uncertain at this point whether the impact of the halibut bycatch mortality will be less or more but that evaluation is being undertaken as a part of the International Pacific Halibut Commission's ongoing research. Although the IPHC includes all sources of mortality in annual stock assessments, and therefore accounts for bycatch in estimated fishery yields, mortality of halibut <26 inches is not included in IPHC's annual limits. The degree that this source of mortality has become more influential in population trends is largely unknown; however, bycatch of all sizes currently comprises a larger fraction of the total mortality than in previous analyses (20% of the projected 2014 removals from all sources). There is the potential, even under current PSC limits, that bycatch mortality could preclude all directed fishery activities in specific regulatory areas if further declines in apportioned biomass estimates are observed.*

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

Jeff Guyon – June 10, 2013

NMFS/AFSC/ABL

What resource component is this review for? Prohibited Species

What sections of the PSEIS were reviewed? 4.9.2.2 Pacific Salmon or Steelhead Trout

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Since the 2004 PSEIS, the following fishery management plan amendments have been made regarding the salmon bycatch:

1. Amendment 91 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (implemented in 2011) and
2. Amendment 93 to the Fishery Management Plan for Groundfish of the Gulf of Alaska (implemented in 2012).

These amendments set a cap for the number of Chinook salmon that can be caught as bycatch in both the Bering Sea and the Gulf of Alaska.

### 2 Has the status of the resource changed?

The 2004 PSEIS focuses on both Chinook and chum salmon and specifically highlights issues for western Alaska. Since 2004, Yukon and Kuskokwim River Chinook salmon escapements have declined through 2011 to about a third of what they were in 2004 (2012 ADF&G Chinook Research Plan – see Figures 13 and 14 in [http://www.adfg.alaska.gov/static/home/news/hottopics/pdfs/chinook\\_research\\_plan.pdf](http://www.adfg.alaska.gov/static/home/news/hottopics/pdfs/chinook_research_plan.pdf)).

Federal commercial fishing disaster declarations have been issued for Yukon River Chinook salmon for each year through 2008-2012. Other disaster declarations have also been issued for the Kuskokwim and Cook Inlet areas.

The Upper Yukon stock of chum salmon, also known as the fall stock, is a general indicator species which is monitored for treaty purposes. Since 2004 when the run size was 614 thousand fish, the estimated run size for fall Yukon River chum salmon has varied significantly with the run peaking over 2.3 million fish in 2005, but generally trending back to 2004 levels in more recent years (The United States and Canada Yukon River Joint Technical Committee – Yukon River Salmon 2011 Season Summary and 2012 Season Outlook -Table 18 in <http://yukonriverpanel.com/salmon/wp-content/uploads/2009/03/jtc-report-summary-2011-preseason-2012.pdf>)

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2004, there was limited stock composition information available for both the Chinook and chum salmon bycatch in the Bering Sea and Gulf of Alaska trawl fisheries. Since then, there have been a number of genetic stock composition analyses completed for sample sets from the 2005-2011 Bering Sea Chinook salmon bycatch, 2010-2011 Gulf of Alaska Chinook salmon bycatch (very limited sample sets),

and 2005-2011 Bering Sea chum salmon bycatch. These analyses were completed using more refined baselines than available in 2004. In addition, coded wire tags (CWTs) recovered from Chinook salmon caught in the trawl bycatch have been analyzed each year through 2012. Additionally, for 2011, the North Pacific Observer Program instituted a systematic random sampling protocol for the collection of genetic and CWT samples in the Bering Sea. This has produced the most representative genetic sample set available to date for understanding the stock composition of the Chinook and chum salmon bycatch in the Bering Sea.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Since 2004, the impacts of the both the Bering Sea Chinook and chum salmon bycatch relative to escapement and maturity have been completed and incorporated into the associated EIS (Chinook salmon) and draft EA (chum salmon).

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

There has been a considerable amount of information learned since 2004 about the stock origin of salmon caught in the Alaska groundfish trawl bycatch. For the PSEIS, the impacts for chum salmon could be updated using the most current impact analysis drafted for the Environmental Assessment. In addition, the Gulf of Alaska salmon bycatch for both Chinook and chum salmon was thought in 2004 to be composed of a similar stock origin as that in the Bering Sea. We now know that the stock origins for Chinook salmon are very different between these two areas. Consequently, this section could be updated to include the most current information and assessments.

## Review of Conclusions in 2004 PSEIS

What resource component is this review for? **BSAI king crab**  
 What sections of the PSEIS were reviewed? **Section 4.5.2.4 and 4.9.2.4**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

The management measures regulating BSAI king crab as a prohibited species in groundfish fisheries are unchanged since 2004. BSAI king crab remains a Prohibited Species in the BSAI groundfish fisheries. However, implementation of Amendment 80 to the BSAI Groundfish FMP has had some impact on the bycatch of BSAI king crab. Amendment 80 directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-American Fisheries Act (AFA) trawl catcher/processor fleet. This was accomplished by providing the ability to form cooperatives within the newly formed Amendment 80 sector. The partitioning of PSC (prohibited species catch) among the fishery cooperatives has reduced the rate of bycatch per target catch ton.

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery to reduce impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, southern Tanner crab, and snow crab.

New overfishing definitions and total catch accounting for BSAI crab stocks were implemented in 2008 with Amendment 24. Reference points and biomass values for BSAI king crab are estimated using an assessment model and a 5 Tier system. Starting in 2011, with the implementation of Amendment 38, annual catch limits are set for BSAI crab stocks in addition to OFLs.

### 2 Has the status of the resource changed?

BSAI king crab species include red king crab (*Paralithodes camtschaticus*), blue king crab (*Paralithodes platypus*), and golden (or brown) king crab (*Lithodes aequispinus*). The status of these stocks are evaluated and reported annually in the Council's SAFE report. Although abundance has been variable since 2004, the status of the majority of these king crabs relative to the status determination criteria has not changed, with the exception of St Matthew blue king crab, which was declared rebuilt in 2009 (NPFMC 2013). Pribilof Islands blue king crab, which was subject to a rebuilding plan, failed to rebuild within the ten year time frame ending in 2011.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2012, a Council discussion paper considered the importance of trawl effort on Bristol Bay red king crab to assess the essential fish habitat of red king crab. The Council recommended continued research on

the definition of red king crab habitat at multiple life stages and also continued evaluation of existing Bristol Bay red king crab closure areas.

The Council is also assessing the historical bycatch of crab stocks by groundfish fisheries by gear and the measures currently employed under the BSAI FMP and NMFS regulations to limit the bycatch by crab stock. In February 2014, the Council reviewed a discussion paper that evaluates the existing closure areas for Bristol Bay red king crab, Bering Sea Tanner crab, Bering Sea snow crab, and St. Matthew blue king crab, including information on recent stock distribution and the distribution and amount of crab bycatch in the trawl and fixed gear groundfish fisheries. The discussion paper included review of the proportion of bycatch by trawl and fixed gear fisheries inside and outside of the closure areas and a more detailed history of the closures to help identify the fraction of historical fisheries that occurred in these areas as well as their crab bycatch. This discussion paper is intended to assist the Council in deciding what, if any, action to take to modify the existing management measures for these 4 stocks.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

No. Since 2004, the stock assessment models have improved greatly. Crab bycatch is accounted for in the estimate of total catch used in the stock assessment models and to evaluate total catch relative to the annual catch limits.

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

#### **Citations**

NPFMC. 2013. Stock Assessment and Fishery Evaluation Report for the King And Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions: 2013 Crab SAFE. North Pacific Fishery Management Council, 605 W. 4th Avenue, #306, Anchorage, AK 99501.

NPFMC. 2014. Crab PSC in the Bering Sea/Aleutian Islands Fisheries. Discussion paper. January. North Pacific Fishery Management Council, 605 W. 4th Avenue, #306, Anchorage, AK 99501.

## Review of Conclusions in 2004 PSEIS

draft 6/19/2013

What resource component is this review for? **BSAI Snow crab**

What sections of the PSEIS were reviewed? **Section 4.9.2.4**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

From the perspective of the BSAI Groundfish FMP, management of the BSAI snow crab is qualitatively unchanged. BSAI snow crab remains a Prohibited Species in the BSAI groundfish fisheries. However, implementation of Amendment 80 to the BSAI FMP has had some impact on the bycatch of BSAI snow crab. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. The partitioning of PSC (prohibited species catch) among the fishery cooperatives has reduced the rate of bycatch per target catch ton. New overfishing definitions and total catch accounting for BSAI crab stocks were implemented in 2008 with Amendment 24. Reference points and biomass values for BSAI snow crab are estimated using an assessment model and a 5 Tier system, where snow crab is a Tier 3 stock (Turnock and Rugolo 2011). ABC values are now established for BSAI crab stocks in addition to OFL starting in 2011 with the implementation of Amendment 38.

### 2 Has the status of the resource changed?

The status of the BSAI snow crab resource has changed since the 2004 PSEIS. BSAI snow crab was considered overfished prior to the 2004 PSEIS and the directed fishery for this stock was under a rebuilding plan. In 2011, the stock was declared rebuilt based on a new assessment model (Turnock and Rugolo, 2011).

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

No.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

**Citations**

Turnock, B.J. and L.J. Rugolo. 2011. 2011 Stock Assessment of Eastern Bering Sea Snow Crab. In: Stock Assessment and Fishery Evaluation Report for the King And Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions: 2011 Crab SAFE. North Pacific Fishery Management Council, 605 W. 4th Avenue, #306, Anchorage, AK 99501. pp. 37-168.

## Review of Conclusions in 2004 PSEIS

draft 6/19/2013

What resource component is this review for? **BSAI Tanner crab**

What sections of the PSEIS were reviewed? **Section 4.9.2.4**

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

From the perspective of the BSAI Groundfish FMP, management of the BSAI bairdi Tanner crab is qualitatively unchanged. BSAI bairdi Tanner crab remains a Prohibited Species in the BSAI groundfish fisheries. However, implementation of Amendment 80 to the BSAI FMP has had some impact on the bycatch of BSAI bairdi Tanner crab. The Amendment directly allocated fishery resources among BSAI trawl harvesters in consideration of their historic harvest patterns and future harvest needs in order to improve retention and utilization of fishery resources by the non-AFA trawl catcher/processor fleet. This was accomplished by extending the groundfish retention standards to all H&G vessels and also by providing the ability to form cooperatives within the newly formed Amendment 80 sector. The partitioning of PSC (prohibited species catch) among the fishery cooperatives has reduced the rate of bycatch per target catch ton.

In addition, Amendment 24 (June, 2008) to the BSAI Crab FMP established a 5-tier system for determining the status of crab stocks managed under the FMP, including BSAI bairdi Tanner crab stock. It also established a process for assigning each managed crab stock to a tier and for setting overfishing and overfished levels based on the assigned tier. BSAI bairdi Tanner crab is currently in Tier 3 and is not overfished, nor is overfishing occurring (Rugolo and Turnock, 2012).

### 2 Has the status of the resource changed?

The technical status of the BSAI bairdi Tanner crab resource has changed since the 2004 PSEIS, although its effective status remains the same. BSAI bairdi Tanner crab was considered overfished prior to the 2004 PSEIS and the directed fishery for this stock was closed (1997/98-2004/05). Subsequently, the directed fishery has been both open (2005/06-2009/10) and closed (2010/11-2011/12). In 2012, the stock was declared rebuilt based on a new assessment model (Rugolo and Turnock, 2012). However, stock abundance remains relatively low compared with historic levels and the State of Alaska did not allow a directed fishery in 2012/13.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

In 2011, a trawl sweep modification requirement was implemented for vessels participating in the Bering Sea flatfish fishery resulting in less impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Research has demonstrated that this gear modification reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

**4 Are there new methods of analysis or protocols for evaluating impacts?**

No.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No.

**Citations**

Rugolo, L.J. and B.J. Turnock. 2012. 2012 Stock Assessment and Fishery Evaluation Report for the Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions. In: Stock Assessment and Fishery Evaluation Report for the King And Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions: 2012 Crab SAFE. North Pacific Fishery Management Council, 605 W. 4th Avenue, #306, Anchorage, AK 99501. pp. 267-416.

## Review of Conclusions in 2004 PSEIS

What resource component is this review for? **GOA king and Tanner crab**  
 What sections of the PSEIS were reviewed? **Section 4.9.2.4**

### 1 Has management of the resource changed?

Crab remain a Prohibited Species in the GOA groundfish fisheries. Additionally, the Council approved an area closure in Marmot Bay in 2010, to protect Tanner crab from impacts of the groundfish trawl fisheries (implemented in 2014).

Also in 2014, a trawl sweep modification requirement was implemented for vessels participating in the GOA flatfish fishery to reduce impact of the fishery on the seafloor. Elevating devices (e.g., discs or bobbins) are now required to be used on the trawl sweeps to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor.

### 2 Has the status of the resource changed?

The GOA red king crab species remains at historically low levels, and the Tanner crab stock continues to show high variability in recruitment. Little is known about golden or blue king crab. There have been no changes to the state assessment methodology, and no regulatory changes to the harvest strategy or management structure. The prevailing conditions identified in the 2004 document that likely drive these trends remain unchanged.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There is no substantive new information regarding the impacts of the groundfish fisheries on the resources with respect to state-managed fisheries. More observer coverage is available under the federal restructured observer program. The Council analyzed impacts of the GOA groundfish fisheries on Tanner crab in two NEPA analyses, and instituted a trawl-gear area closure, and the trawl sweep modification requirement in the GOA flatfish fishery. Research has demonstrated that this gear modification reduces unobserved mortality of king and Tanner crab.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

No. There have been no changes to the state assessment methodology, and no regulatory changes to the harvest strategy or management structure.

### 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

No. The abundance of GOA crab stocks is similar to that reported in the 2004 PSEIS.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

~6/19/2013

What resource component is this review for? BSAI & GOA forage fishes  
What sections of the PSEIS were reviewed? 4.9.4

### 1 Has management of the resource changed?

Forage fish management has not changed in either the BSAI or GOA, except in the way that they are designated in the FMP: they are now listed as “Ecosystem Components” and explicitly removed from the requirement for harvest specifications. As described in the 2004 PSEIS, directed fishing for forage fishes is prohibited and there are strict limits on retention and processing. There are now forage fish reports for both the BSAI and GOA that are published on a biennial basis as appendices to the SAFE documents.

### 2 Has the status of the resource changed?

As described in the 2004 PSEIS, very little information exists regarding the status of forage fishes (section 3.5.4). While the forage fish reports have been improved with substantial amounts of new information, there remain no reliable estimates of forage fish abundance. The available evidence suggests that forage fish abundance fluctuates independent of fishery activities.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

The forage fish reports now include more detailed information regarding state-waters removals of eulachon; as estimated in the original PSEIS these removals are on a small scale. The eulachon population in the Pacific Northwest has been declared “threatened” under the Endangered Species Act (75 FR 13012). The causes of eulachon declines in the PNW are unknown but are thought to include habitat destruction, overfishing, and climate change effects. Although the threatened population is thought to be discrete from eulachon stocks in Alaska, this development emphasizes the importance of continuing the conservation measures established in the BSAI and GOA FMPs.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

No new methodologies exist for evaluating impacts. It is hoped that current research regarding forage fish abundance and distribution will provide a better understanding of forage fish populations, but it is unlikely that a reliable index of status will be available in the near future.

### 5 Would a new analysis using the latest methods and information reach a seriously different conclusion?

It is unlikely that a new analysis would reach a seriously different conclusion. Forage fishes continue to be caught only incidentally, and there are no new data to suggest that their status has changed.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/7/13

What resource component is this review for? non-specified

What sections of the PSEIS were reviewed? 4.9.5

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

There have been no changes to the management of non-specified species. Unofficial Stock Assessment and Fishery Evaluation Reports (SAFEs) have been prepared for grenadiers since 2006. These have undergone annual review by the Plan Team and SSC, but the recommendations are not used for management.

### 2 Has the status of the resource changed?

The status of unspecified species was unknown due to a lack of data in the PSEIS in 2004. In the unofficial grenadier SAFE reports conducted since 2006, catch, biomass, fishery and survey length frequencies, and indices of abundance are tracked. These data indicate that population trends are stable; catch relative to abundance is < 2%. There is disproportionate catch of females in surveys and in the fishery; however, all data indicate that catch of grenadier has not affected the stock status. Catch of giant grenadier continue to be the vast majority of the grenadier catch.

Age at maturity and natural mortality information is now available for grenadiers. Natural mortality is low, the species are long-lived (at least 58 years maximum age), and the age at which 50% of females are mature is older than most groundfish (23 years).

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Since grenadiers are caught primarily in the sablefish longline fishery and the ABCs and TACs for sablefish have decreased in recent years, the impacts of groundfish fisheries have decreased.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

In the unofficial grenadier SAFE reports catch, biomass, fishery and survey length frequencies, and indices of abundance are now tracked.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

There is no new information available currently. With the implementation of the observer restructuring in 2013, more information on catch on smaller vessels as well as catch in the Pacific halibut fishery will be available. Since catch has been very low compared to the estimated biomass for grenadier, adding these new catch estimates should not change the conclusion of no observed impact of groundfish fisheries on grenadiers.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/5/13

What resource component is this review for? Marine Mammals

What sections of the PSEIS were reviewed? Steller sea lions western and eastern population segments

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

*Yes, With regard to western dps of Steller sea lions there was a recent change in fisheries management due to the conclusions of the 2010 Ground fish biological opinion which found that the management regimes in place at the time “were likely to adversely modify the designated critical habitat for the western DPS of Steller sea lion”*

*([http://alaskafisheries.noaa.gov/protectedresources/stellers/esa/biop/final/biop1210\\_chapters.pdf](http://alaskafisheries.noaa.gov/protectedresources/stellers/esa/biop/final/biop1210_chapters.pdf)). This included new closures and restrictions on atka mackerel and Pacific cod fisheries in areas 541 – 543. There is currently a new EIS and likely a new biological opinion due out in the next six months that will again review these closures and potentially propose new fishery regulations. The most up to date source for all of this will be the draft environmental impact statement for the Bering Sea and Aleutain Islands Management Area. (<http://alaskafisheries.noaa.gov/newsreleases/2013/sslpmeis051413.htm>). Once a preferred alternative is chosen, a new biological evaluation may also be released (depending on whether the chosen alternative is different from the status quo) which will again incorporate all recent information pertinent to this topic.*

*There has not been a change in management of the eastern DPS however it should be noted that the eastern dps has been proposed for de-listing from the endangered species list (<http://alaskafisheries.noaa.gov/newsreleases/2012/ssledps041812.htm>). The final decision on this proposal is expected sometime in the summer of 2013.*

*Overall, these two documents should serve to update virtually everything in this PEIS review given that they have been put together in the last 12 months and are by far the most comprehensive and up to date sources of information for the western stock of Steller sea lions. In addition the Steller Sea Lion Recovery Plan was re-written in 2008.*

### 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

*Yes, the status has changed with regard to the abundance and regionally with regard to the trends. This is all reported in both the EIS and Biop noted above for the western DPS and in the delisting information*

for the eastern DPS. Both stocks have increased in number overall. This change in abundance will have a concurrent change in PBR (See 2012 Stock Assessment Report, Allen and Angliss, 2013, <http://www.nmfs.noaa.gov/pr/sars/pdf/ak2012.pdf>)

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

*Yes, based on the conclusions of the 2010 Groundfish Biological Opinion, the fisheries were affecting the resource differently in 2010. This may again be changing depending on the final EIS of 2013 and the subsequent Biological Opinion of 2014. Both of these documents should be used to guide this particular topic when necessary. For example, a paper by Zeppelin et al. In 2004 demonstrated that there was, "Considerable overlap (>51%) in the size of walleye pollock and Atka mackerel taken by Steller sea lions and found in scat, and the sizes of these species caught by the commercial trawl fishery" (Zeppelin et al. 2004).*

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

*There are no new methods per se but there have been more recent analyses using conventional methods since this document was written. In addition, there have been a number of publications on food habits, abundance, foraging behavior, contaminants, and vital rates since 2004. These and others are all summarized in the EIS and BiOp noted above.*

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

*Possibly, As noted previously, there has been quite a bit of information gathering completed on western DPS Steller sea lions especially since 2004 and is all summarized in the EIS and 2010 BiOp and will be again in the 2014 BiOp. I would suggest a review of those documents rather than a new analysis. A Status Review of the eastern DPS has also been completed as well as a draft Post-delisting Monitoring Plan. These documents should be sufficient for updating this particular document.*

Recent References:

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**Template for PSEIS SIR – review of conclusions in 2004 PSEIS**  
draft 6/5/12

What resource component is this review for? Marine Mammals

What sections of the PSEIS were reviewed? Northern Fur Seals

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

## 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

*No, the management program has not changed, but the population has continued to decline. The Eastern Pacific stock of northern fur seals are still considered depleted under the Marine Mammal Protection act and still declining at just under 5% annually (between 1998 – 2012; Towell et al. 2013 (<http://www.afsc.noaa.gov/nmml/pdf/2012-nfs-pup-adult-counts-pribs.pdf>). In 2007 NMFS published a new conservation plan (National Marine Fisheries Service. 2007. Conservation plan for the Eastern Pacific stock of northern fur seal (*Callorhinus ursinus*)) that summarized all relevant information to date at the time. National Marine Fisheries Service, Juneau, Alaska. In addition, the 2012 Stock Assessment Report. Subsistence harvest has declined significantly since the dates listed in the 2004 version of this document. In 2012 less than 500 sub adult males were taken for the subsistence harvest in the Pribilof Islands.*

*A recent petition to change the harvest regulations for both islands would, if approved, potentially increase the number of harvested fur seals on both islands. This is most notable by the request to harvest fur seal pups on both islands (<http://alaskafisheries.noaa.gov/protectedresources/seals/fur/analysis/ea0412.pdf>).*

## 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

*Yes, the status has changed with regard to the abundance with significant declines on both Pribilof islands in the last 15 years. This decline for the stock has been partially offset by an increase in abundance on Bogoslof Island where an annual rate of increase of 38% has occurred since 1980 and the population estimate of almost 23,000 pups now exceeds that of St. George Island (Towell and Ream, 2012, [http://www.afsc.noaa.gov/nmml/PDF/BogPupMem11\\_final.pdf](http://www.afsc.noaa.gov/nmml/PDF/BogPupMem11_final.pdf)) I cannot tell given the information provided if this change in status is within the range of variability analyzed in the 2004 PSEIS nor is there definitive information as to what may have affected this change in status or what caused it.*

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

*It is unknown if the fisheries are affecting northern fur seals differently now than in 2004 but there is additional published literature available indicating similar habitat and prey use by both consumers (see list below). To my knowledge there has not been subsequent NEPA analysis. A paper published in 2006 by C. Gudmundson et al described an analysis of northern fur seal prey habits that included scat and spew samples. This study found that prey remains from adult pollock did not appear as often in the scat as in spew samples. “The differences in walleye pollock age classes between scat and spew samples seem to indicate that size estimations of pollock consumed by northern fur seals have likely been underestimated in previous studies using G.I. tracts and scat” (Gudmundson et al. 2006). In fact the study reported that the percent overlap between age classes of walleye Pollock caught by the commercial trawl fishery and those found in northern fur seal scat on the Pribilof Islands was between 4 – 15% while it was between 89 – 95% for spews.*

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

*There are no new methods per se but there have been more recent analyses using conventional methods since this document was written. In addition, there have been a number of publications on food habits, abundance, foraging behavior, and disease since 2004 (see list below). I don’t know of any new NEPA analysis of management actions since the 2004 PSEIS.*

Would a new analysis using the latest methods and information reach a seriously different conclusion? If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

*Possibly. If an analysis were to be completed that showed a strong link between commercial fisheries and the decline of northern fur seals it would likely have some effect on management decisions. There is ongoing research looking at this topic or at least looking for correlates and associations that would lead to further examination. Currently the cause of the ongoing decline is unknown.*

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## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/24/13

What resource component is this review for? Marine Mammals

What sections of the PSEIS were reviewed? Harbor seals, Other Pinnipeds (but only the four ice-associated seals: bearded, ribbon, ringed and spotted. Not walrus, elephant seals or sea otters).

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component

### 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

**Harbor seals:** Yes, in 2010 the three previously recognized stocks of harbor seals in Alaskan waters were subdivided into twelve stocks (Allen and Angliss 2012).

**Ice-associated seals:** In October, 2006, NMFS entered into an agreement with the Ice Seal Committee, an Alaska Native Organization representing five coastal regions of communities that use ice-associated seals for nutritional and cultural purposes. Also, see #2 for the potential for critical habitat designation for bearded and ringed seals.

### 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

**Harbor seals:** Prior to subdividing the three stocks into twelve (see #1), harbor seals in Bristol Bay, the Pribilof Islands and Lake Iliamna, AK were part of a single Bering Sea stock. Harbor seals in Lake Iliamna have recently been petitioned for listing as “threatened” or ‘endangered’ under the Endangered Species Act (ESA), and the NMFS is currently preparing a Status Review of that population to aid in a listing decision. Harbor seals in the Aleutian Islands have declined substantially since the early 1980s, especially in the western Aleutians (Small et al. 2008).

**Ice-associated seals:** Mostly out of concerns about effects of climate change on sea ice habitat, all four ice-associated seal species were the subjects of petitions for listing under the ESA. The NMFS prepared Status Reviews on each of the four species and determined that:

- 1) **Ribbon seals** should not be listed under the ESA (Boveng et al. 2008). However, NMFS is currently revisiting this determination (National Marine Fisheries Service 2011) and will publish an updated Status Review and proposed decision in July, 2013.
- 2) **Spotted seals** should not be listed in Alaskan waters, but a small Asian population was listed as “threatened” (Boveng et al. 2009, National Marine Fisheries Service 2010).
- 3) The Arctic subspecies of **ringed seals** (*P. h. hispida*) including all ringed seals in Alaskan waters, was listed as “threatened” (Kelly et al. 2010, National Marine Fisheries Service 2012a). The NMFS is currently considering critical habitat designations.

- 4) The “Beringia” Distinct Population Segment (DPS) of **bearded seals**, including the Bering, Chukchi, Beaufort, and East Siberian Seas, was listed as “threatened” (Cameron et al. 2010, National Marine Fisheries Service 2012b). The NMFS is currently considering critical habitat designations.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

**Harbor seals:** Splitting the three stocks into twelve led to individual stocks with lower abundance. For example, the Pribilof Island stock of harbor seals (which used to belong to the larger Bering Sea stock) is small, with a population estimate of only 232 (Allen and Angliss 2012). Such a low population suggests the potential for groundfish fisheries to have significant impacts on this stock, but there is no new information on the issue or management plan. Declines of harbor seals in the Aleutian Islands show the same geographic pattern as declines in Steller sea lions, with the strongest declines in the west, and less severe declines to the East. Although the cause of these declines has not been determined, the geographic pattern suggests a possible connection to the mechanism(s) responsible for the sea lion decline.

**Ice-associated seals:** Although not “new” information, the Status Reviews referenced in #2 were more comprehensive summaries of the available literature on the food habits of ice-associated seals. For example, in contrast to the PSEIS, the status reviews indicate that various species of demersal/groundfish are important to both ribbon and bearded seals, at least in some areas, seasons and/or years.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

No. New and unique analyses are not required; the need is for good data. New field efforts are required.

### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

**Harbor seals:** Given the paucity of information about the foraging ecology of this species, especially in the Aleutian Islands, it is unlikely that new methods of analysis would lead to a different conclusion about the effects of groundfish fisheries..

**Ice-associated seals:** The “new” information referenced in #3 is limited (e.g., small sample sizes, little to no indication of size/age of prey taken, contrasting study results), so firm conclusions would be difficult or impossible to develop. But given the more comprehensive, and in some cases differing, reviews of food habits presented in the status reviews, a re-analysis may be warranted.

**Literature cited**

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## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/4/13

What resource component is this review for? Marine Mammals  
 What sections of the PSEIS were reviewed? Killer whale (transients), Other toothed whales, Baleen whales

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

No

### 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

#### Killer Whale (Transients):

In January 2004 the North Gulf Oceanic Society (NGOS) and the National Marine Mammal Laboratory (NMML) held a joint workshop to match identification photographs of transient killer whales from this population. That analysis of photographic data resulted in the following minimum counts for ‘transient’ killer whales belonging to the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient stock. A total count of 552 individual whales have been identified in the Gulf of Alaska, Aleutian Islands, and Bering Sea transient killer whale stock (Allen and Angliss, 2013). Line transect surveys from 2001-2003 estimated transient killer whale abundance at 249 (CV = 0.50), with 95% confidence interval of 99-628 (Zerbini et al. 2007). Unclear how this new information would affect the analysis in the 2004 PSEIS.

AT1 transients: At least 11 animals were alive in 1998, but it appears that as of 2009, only 7 individuals remain alive. The AT1 group has been reduced to 32% (7/22) of its 1984 level (Matkin et al. 2008). This should not change the conclusions reached in the 2004 PSEIS.

#### Other Toothed Whales:

The Alaska Resident stock of killer whales in general continues to increase in population size. However, a few pods in Prince William Sound have declined by a few animals (i.e., AB25, AE, AN20, AS30, AY: Allen and Angliss, 2013). Unclear how this new information would affect the analysis in the 2004 PSEIS.

Harbor porpoise: Because the most recent abundance estimates are 11-13 years old and information on incidental harbor porpoise mortality in commercial fisheries is not well understood, all Alaska stocks of harbor porpoise (Gulf of Alaska, Bering Sea, and Southeast) are classified as strategic stocks. Unclear how this new information would affect the analysis in the 2004 PSEIS.

In the 2004 PSEIS, Cook Inlet belugas were listed as depleted under the MMPA. The population has continued to decline. Cook Inlet beluga whales were listed as a Distinct Population Segment under the Endangered Species Act in 2008 and Critical Habitat was designated throughout much of Cook Inlet in 2011. This change in status may require reanalysis.

The Bristol Bay beluga stock continues to increase in size. The Alaska Department of Fish and Game and the Alaska Beluga Whale Committee conducted beluga surveys in Bristol Bay in 1999, 2000, 2004 and 2005, with maximum counts of 690, 531, 794, and 1,067 (Lowry et al. 2008). Using the correction factors described above and the maximum counts for 2004 and 2005 gives population estimates of 2,455 and 3,299 (L. Lowry, University of Alaska Fairbanks, pers. comm.).

No new information on Pacific white-sided dolphins, Dall's porpoise, sperm whales, or beaked whales (Allen and Angliss, 2013).

#### Baleen Whales:

Humpback whales: A large-scale study of humpback whales throughout the North Pacific was conducted in 2004-06 (the Structure of Populations, Levels of Abundance, and Status of Humpbacks (SPLASH) project). Initial results from this project (Calambokidis et al. 2008, Barlow et al. 2011), including abundance estimates and movement information, have been reported in Baker et al. (2008), and are also summarized in Fleming and Jackson (2011); however, these results are still being considered for stock structure analysis (Allen and Angliss, 2013). This may require reanalysis.

North Pacific right whales were relisted under the ESA as a species in 2008 and Critical Habitat was designated in the Bering Sea and Gulf of Alaska in 2006. Abundance estimates as of 2008 indicate fewer than 60 whales in Alaska waters (Wade et al., 2011). This change in status should not affect the conclusions reached in the 2004 PSEIS.

The Western Arctic bowhead whale stock has been increasing in recent years; the estimate of 12,631 (in 2004) is between 22% and 124% of the pre-exploitation abundance (estimates ranging roughly from 10,000 to 55,000), and this stock may now be approaching its carrying capacity (Brandon and Wade 2004, 2006). This should not affect the conclusions reached in the 2004 PSEIS.

For Eastern North Pacific gray whale, the most recent estimate of abundance is from the 2006/2007 southbound survey, or 19,126 (CV=7.1%) whales (Laake et al. 2009). Because of observed interannual differences in correction factors used to correct for bias in estimating pod size (Rugh et al. 2008), the time series of abundance estimates dating back to 1967 was reanalyzed. Laake et al. (2009) developed a more consistent approach to abundance estimation that used a better model for pod size bias and applied their estimation approach to reestimate abundance for all 23 surveys. This reanalysis did not change the current status of Eastern North Pacific gray whales which is continuing to increase at about 3.2% per year (Punt and Wade 2010). This should not affect the conclusions reached in the 2004 PSEIS. However, three gray whales from the western North Pacific that were tagged with satellite transmitters (one in 2010, two in 2011) migrated from Russian waters crossing the Bering Sea and Gulf of Alaska after passing through Unimak and Umnak passes, following eastern North Pacific gray whales during their southbound migration to Mexico (see Mate et al. 2011; Mate and Ilyashenko, unpublished data, <http://mmi.oregonstate.edu/sakhalin2010Map>). On the northward migration, the one whale still transmitting locations followed the coastline from Mexico to Alaska before entering the Bering Sea

through Unimak Pass then returning along the ice edge to Russian waters. Since this discovery additional photographic matches have been found between whales observed off Sakhalin Island, Russia, and in the Mexico lagoons. The western population of North Pacific gray whales (WGW), once thought extinct, is now estimated at 130 individuals and feeds primarily off northeastern Sakhalin Island, Russia, during summer.

No new information on fin whales, sei whales, minke whales (Allen and Angliss, 2013) or blue whales (Carretta et al. 2012).

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?

#### Killer Whale (Transients):

In previous assessments, there were six different federal commercial fisheries in Alaska that could have had incidental serious injuries or mortalities of killer whales and were observed. In 2004, the definitions of these fisheries were changed to reflect target species; these new definitions have resulted in the identification of 22 observed fisheries that use trawl, longline, or pot gear. Of these fisheries, there were two which incurred serious injury and mortality of killer whales (any stock) between 2007 and 2009: the BSAI flatfish trawl and the BSAI Greenland turbot longline. The mean annual (total) mortality rate for all fisheries for 2007-2009 was 1.5 (CV =0.19) (note: This does not include the AT1 pod with a known range limited to waters of Prince William Sound and Kenai Fjords where there are no federally managed commercial fisheries). Unclear how this new information would affect the analysis in the 2004 PSEIS.

#### Other Toothed Whales:

Over the past few years, observers have collected tissue samples of many of the killer whales which were killed incidental to commercial fisheries. Genetics analyses of samples from the killer whales have indicated that the mortalities incidental to the BSAI flatfish trawl and the BSAI Pacific cod fisheries are of the “resident” type, and mortalities incidental to the BSAI pollock trawl fishery are of the “transient” type (M. Dahlheim, pers. comm., National Marine Mammal Laboratory, Alaska Fisheries Science Center, 7600 Sand Point Way, NE, Seattle, WA 98105). The mean annual estimated level of serious injury and mortality of Alaska resident killer whales is 1.49/year (Allen and Angliss, 2013). There are many reports of killer whales consuming the processing waste of Bering Sea groundfish trawl fishing vessels (Perez 2006). However, the ‘resident’ stock of killer whales is most likely to be involved in such fishery interactions since these whales are known to be fish eaters, while ‘transient’ whales have only been observed feeding on marine mammals. Recently, several fisheries observers reported that large groups of killer whales in the Bering Sea have followed vessels for days at a time, actively consuming the processing waste (Fishery Observer Program, unpubl. data, Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA 98115). On some vessels, the waste is discharged in the vicinity of the vessel’s propeller (NMFS unpublished data); consumption of the processing waste in the vicinity of the propeller may be the cause of the propeller-caused mortalities of resident killer whales in the BSAI flatfish trawl fishery. Unclear how this new information would affect the analysis in the 2004 PSEIS.

One harbor porpoise mortality was observed in 2007 in the Bering Sea/Aleutian Islands flatfish trawl, which is the only harbor porpoise mortality observed during the 2007-2010 period. Therefore, the mean

annual (total) mortality rate resulting from observed mortalities was 0.53 (Allen and Angliss, 2013). Because the abundance estimates are 13 years old and information on incidental mortality in commercial fisheries is sparse, the Bering Sea stock of harbor porpoise is classified as a strategic stock. Unclear how this new information would affect the analysis in the 2004 PSEIS.

Between 2007 and 2010, there was one observed serious injury of a sperm whale in the Gulf of Alaska sablefish longline fishery (Allen and Angliss, 2013). This animal was designated as seriously injured because it became caught in the gear, and was released alive with trailing gear. Unclear how this new information would affect the analysis in the 2004 PSEIS.

There were no serious injuries or mortalities incidental to observed commercial fisheries reported for Pacific white-sided dolphins, beluga whales, or any of the beaked whales (Perez 2006; Allen and Angliss, 2013). However, for Bristol Bay belugas it is unknown whether the U. S. commercial fishery-related mortality level is insignificant and approaching zero mortality and serious injury rate (i.e., 10% of PBR; less than 4.9 per year) because a reliable estimate of the mortality rate incidental to commercial fisheries is currently unavailable. Similarly, current observer data on fisheries within Cook Inlet are lacking; however, no mortalities in U. S. commercial fisheries have been reported for this beluga stock. Thus annual mortality levels are considered insignificant and approaching zero mortality and serious injury rate, although the lack of recent fisheries data is a concern for this small population.

#### Baleen Whales:

Humpback whales: For the Western North Pacific stock, the estimated human-related mortality rate based solely on mortalities that occurred incidental to U. S. commercial fisheries is 0.37; therefore, the estimated fishery mortality and serious injury rate exceeds 10% of the PBR (0.2) and cannot be considered insignificant and approaching zero (Allen and Angliss, 2013). This may require reanalysis.

No mortalities or serious injuries by groundfish commercial fisheries were reported for fin whales, minke whales, North Pacific right whales, bowhead whales (Allen and Angliss, 2013), gray whales, or blue whales (Carretta et al. 2012). However, there is little information on western gray whales that may migrate through Alaska waters during the winter months.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?

No

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.

Potentially for Cook Inlet beluga whales now listed as a DPS under ESA.

Also, Bering Sea harbor porpoise, Western North Pacific stock of humpback whales, western gray whales, and killer whales (see notes above).

### Citations

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Rugh, D.J., Muto, M.M., Hobbs, R.C. and J.A. Lerczak. 2008. An assessment of shore-based counts of gray whales. *Mar. Mammal Sci.* 24: 864-880.

Wade, P. R., A. Kennedy, R. LeDuc, J. Barlow, J. Carretta, K. Sheldon, W. Perryman, R. Pitman, K. Robertson, B. Rone, J. Carlos Salinas, A. Zerbini, R. L. Brownell, Jr., and P. Clapham. 2011. The world's smallest whale population. *Biol. Letters* 7:83-85.

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## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

What resource component is this review for? Marine Mammals – Sea otters

What sections of the PSEIS were reviewed? 4.9.8.9

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Yes. On August 9, 2005, U.S. Fish and Wildlife Service (USFWS) published a final rule (70 FR 46366) to list the southwest Alaska Distinct Population Segment (DPS) of the northern sea otter (*Enhydra lutris kenyoni*) as threatened under the Endangered Species Act.

On October 8, 2009, the USFWS published a final rule designating 15,164 square kilometers (5,855 square miles) as critical habitat for the southwest Alaska DPS of the northern sea otter (74 FR 51988). The critical habitat rule became effective on November 9, 2009. The critical habitat is designated in five units: the Western Aleutian Unit; the Eastern Aleutian Unit; the South Alaska Peninsula Unit; the Bristol Bay Unit; and the Kodiak, Kamishak, Alaska Peninsula Unit. Within these units, critical habitat occurs in nearshore marine waters ranging from the mean high tide line seaward for a distance of 100 meters, or to a water depth of 20 meters. While sea otter critical habitat predominately occurs within state waters, DOI has designated some critical habitat within federal waters where water depth is 20 meters or less.

On September 6, 2013, the USFWS announced the availability of the recovery plan for the southwest Alaska DPS of the northern sea otter (78 FR 54905). The recovery plan describes the status, current management, recovery objectives and criteria, and specific actions needed to enable us to delist the southwest Alaska DPS of the northern sea otter (USFWS 2013a).

### 2 Has the status of the resource changed?

Yes. The southwest Alaska DPS of the northern sea is now listed as threatened under the Endangered Species Act. However, based on the most recent comprehensive assessment of the northern sea otter status in the 2013 Recovery Plan, the population abundance and trends have generally not notably changed since the early 2000s (USFWS 2013a).

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

Yes. In 2006, NMFS and the USFWS consulted on the southwest Alaska DPS of the northern sea otter and the consultation concluded that the groundfish, crab, and scallop fisheries are not likely to adversely affect sea otters.

In response to the designation of critical habitat, NMFS reinitiated Section 7 consultation. The biological assessment evaluated the potential effect of the BSAI Groundfish and GOA Groundfish FMPs on the southwest Alaska DPS of the northern sea otter and its critical habitat. The analysis concluded that the Alaska federally managed fisheries authorized by the FMPs and State of Alaska parallel groundfish

fisheries are not likely to adversely affect the southwest Alaska DPS of the northern sea otter or its designated critical habitat. On July 10, 2013, the USFWS concurred with NMFS's determination that authorization of the specified fisheries is not likely to adversely affect the southwest Alaska DPS of the northern sea otter and will not result in adverse modification of sea otter critical habitat (NMFS 2013, USFWS 2013b).

**4 Are there new methods of analysis or protocols for evaluating impacts?**

No.

**5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. NMFS conducted a new analysis for the Biological Assessment and arrived at a practically similar conclusion (NMFS 2013).

**6 References:**

NMFS. 2013. Biological Assessment of the Effects of the Federal Fisheries, State Parallel Groundfish Fisheries and Pacific Halibut Fisheries on the Southwest Alaska Distinct Population Segment of the Northern Sea Otter and Its Designated Critical Habitat. URL:  
<http://alaskafisheries.noaa.gov/protectedresources/seaotters.htm>

USFWS. 2013a. Southwest Alaska Distinct Population Segment of the Northern Sea Otter (*Enhydra lutris kenyoni*) - Recovery Plan. U.S. Fish and Wildlife Service, Region 7, Alaska. 171pp. URL:  
<http://www.fws.gov/alaska/fisheries/mmm/seaotters/pdf/Recovery%20Plan%20SW%20AK%20DPS%20Sea%20Otter%20Aug13.pdf>

USFWS. 2013b. Letter Re: Statewide NMFS groundfisheries (Consultation Number 2011-0180). From Ellen W. Lance, Endangered Species Branch Chief, to NMFS. URL:  
[http://alaskafisheries.noaa.gov/protectedresources/seaotters/usfws\\_groundfishdetermination0713.pdf](http://alaskafisheries.noaa.gov/protectedresources/seaotters/usfws_groundfishdetermination0713.pdf)

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

*draft 7/17/13*

What resource component is this review for? *Seabirds*

What sections of the PSEIS were reviewed? *Short-tailed Albatross; Laysan and Black-footed Albatross; shearwaters; Northern fulmars; Species of management concern (Red-legged Kittiwakes, Marbled and Kittlitz’s murrelets); Other piscivorous species (most alcids, gulls, and cormorants); other planktivorous species (Storm-petrels and most Auklets); Spectacled Eiders and Steller’s Eiders*

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### **1 Has management of the resource changed?**

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

The primary management action affecting seabird resources was the requirement for longline vessels to use seabird mitigation measures (i.e., streamer lines). This was implemented in February 2004, just before release of the PSEIS. The Freezer Longline fleet had largely adopted the practice of deploying streamer lines in 2002, taking advantage of free streamer lines supplied first by the US Fish and Wildlife Service and later by NOAA Fisheries. Use of seabird avoidance gear has likely reduced overall bycatch by 100,000 birds since implementation (Fitzgerald, pers comm). An analysis of the reduced overall bycatch and reduction in bycatch rates is currently underway at the AFSC in partnership with Washington Sea Grant Program. Another management change – implementation of the restructured observer program in 2013 – will allow a better evaluation of total fishery impacts on the resource in the future.

### **2 Has the status of the resource changed?**

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

Status of the various seabird species groups remains unchanged. The short-tailed albatross population continues to grow at an ca 7.5% rate and is currently estimated to be 4,023 individuals (STAL Recovery Team information). The USFWS and Japanese counterparts have spent 5 years rearing and fledging translocated Short-tailed albatross chicks on Mukojima Island. The project translocated 70 chicks and 69 fledged. In 2012/13 one nesting attempt occurred but failed. This was a 2008 bird. Re-establishing a colony on the island is a goal of the Short-tailed albatross recovery team. The USFWS was petitioned to list the Black-footed albatross at threatened under the ESA. A review was completed on 7 October, 2011 where the FWS determined that listing was not warranted at the time (Federal Register Vol 76, No. 195: 62504-62565). Populations of other birds, such as Northern Fulmars, are extremely difficult to survey and assess due to the remote locations and difficult terrain of their colonies. Trend information for many of these species is not available.

## Review of conclusions in 2004 PSEIS SIR

~6/19/2013

What resource component is this review for? Habitat

What sections of the PSEIS were reviewed? 3.6, 4.1 4.4

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?

Substantial changes to the management of habitat have included implementation of regulations to protect habitat that provides structural relief and gear modifications to limit adverse impacts of trawling on the seafloor. In 2005 in the Aleutian Islands, closure areas that prohibit all bottom trawling in the Aleutians, except in small discrete “open” areas were implemented, and Habitat Conservation Zones with high density coral and sponge habitat were closed to all bottom-contact fishing gear. In 2008 in the Bering Sea, measures were enacted to conserve benthic fish habitat by “freezing the footprint” of bottom trawling by limiting trawl effort only to those areas more recently trawled. A deep slope and basin area and three habitat conservation areas around St Matthew Island, St Lawrence Island were closed to bottom trawling. In 2005 in the Gulf of Alaska several new HAPCs were implemented; the Slope Habitat Conservation Areas, Seamount Habitat Protection Areas, and the Gulf of Alaska Coral Habitat Protection Areas. In 2011 for the Bering sea flatfish fishery elevating devices (e.g., discs or bobbins) are required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor.

For more information see

<http://alaskafisheries.noaa.gov/npfmc/conservation-issues/habitat-protections.html>

and

<http://alaskafisheries.noaa.gov/npfmc/conservation-issues/gear-mods.html>

### 2 Has the status of the resource changed?

Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?

The status or condition of habitat described in the PSEIS was rated as “conditionally significant adverse”. This status was based on the conclusion that, coupled with historical impacts, impacts to long-lived slow growing species (i.e. corals) could cause long-term damage and possibly irreversible loss of living habitat. The word “conditionally” was used to indicate that a significant impact is based on credible scientific information and professional judgement, but more complete information is need for certainty. The current status of habitat is the same as in the 2004 PSEIS because long lived slow growing species have

likely not recovered from the impacts of historical fishing and impacts continue in areas that are open to bottom trawling.

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

As mentioned in the PSEIS, a separate analysis of Essential Fish Habitat (EFH) overlapped PSEIS development. This analysis, resulting in the 2005 EFH EIS, carried out many of the overarching policies anticipated in the preferred alternative. It updated and detailed the designation of EFH for all species managed under the Management Plans, established a process for considering proposed habitats for designation as Habitats of Particular Concern (HAPC), analyzed the effects of fisheries on EFH, and proposed precautionary actions to minimize those effects. That analysis and its subsequent reconsideration in 2009 clearly represent new information regarding the impacts of groundfish fisheries on habitat.

#### **Some additional research on effects of fishing**

Additional research on the habitat requirements of different species  
EFH funded habitat research – e.g., flatfish juvenile habitat

Research and development of modifications to trawl gear to reduce effects on habitat  
Bottom trawl sweep modifications to reduce effects on structure and epifauna, implemented through regulations for Bering Sea and GOA flatfish fisheries.

Limited additional research on the recovery of habitat from damage due to trawl gear  
Some EFH funded research  
Revisiting sites that were trawled 13 years ago in the eastern Gulf of Alaska to evaluate long term effects of trawling on sponge habitat

Improved resolution of data on the distribution of fishing effort due to broader implementation of VMS in Alaska fisheries.

Vast majority of fishing effort is now tracked with VMS, providing much higher resolution of the footprint of those efforts. Full use of such data would likely indicate more area unaffected by fishing but fished areas having higher fishing intensities over analyses based on averaging effort over larger spatial scales. The net effect would be a lowering of LEI estimates, albeit likely small.

Additional information on the distribution of habitat types and features  
Efforts to provide better technology for characterizing habitats  
Detailed habitat mapping in the Gulf of Alaska and Aleutian Islands in the vicinity of fishing activities and for studies of corals

Development of an Alaska Essential Fish Habitat Research Plan (Sigler et al 2012)

Consideration of the EFH EIS analysis resulted in a number of precautionary management actions to reduce the effects of fishing on habitat. This included a number of new areas closed to fishing, particularly bottom trawling, and modifications to fishing gear, specifically trawl sweeps. The existence of those actions will also affect any new analysis of the effects of fishing on habitat.

### **4 Are there new methods of analysis or protocols for evaluating impacts?**

The 2005 EFH EIS included a detailed analysis of the effects of fishing on EFH of Alaska marine species managed under FMPs. This analysis, described in Appendix B of the EIS, included 1) an analysis of the

distribution and intensity of the effects of fishing on classes of features that function as habitat for fish (infaunal prey, epifaunal prey, biological structure and non-living structure) and 2) expert assessments of the potential for that distribution of effects to affect the life history functions of spawning, breeding, feeding, and growth to maturity for each of the managed species. Those assessments were made against the standard of whether they exceeded effects that were ‘more than minimal and not temporary’.

The effects of fishing analysis was based on a model developed by Jeff Fujioka (Fujioka 2006), that considered the combination of fishing intensity, sensitivity of habitat features to fishing, and recovery rates of habitat features to estimate a long-term effects index (LEI), representing the proportional reduction in the habitat feature from the unfished state should that fishing intensity be continued indefinitely. The spatial distribution of LEI values for each habitat features class provided a useful and accessible description of fishing’s effects on habitat, which could then be considered by experts on each managed species to assess the potential for significant effects on life-history processes. A significant limitation on this assessment was the lack of comprehensive data to map the distribution of functional habitat features or the distribution of their use by each life-history stage of the species. These limited the assessment to use of a map of the proportional reduction of such features (LEI) and expert knowledge of the biological needs of each species.

Although this methodology for evaluating impacts is different from that used in the PSEIS, it is important to note that the scope of PSEIS is broader than the EFH EIS. The EFH EIS considered impacts of fishing on benthic marine habitat from the perspective of managed species that are dependent on habitat features. The scope of the PSEIS was broader and considered adverse impacts to marine benthic habitat from the perspective of ecosystem structure and function, as well as managed species.

Other models for the effects of fishing have been proposed and applied in different areas. Such models either provide less specific information or require information that is not available for Alaska fisheries e.g., distribution of habitat features or growth rates of such features). At this point, the Fujioka model remains a good fit for analysis of the effects of Alaska’s fisheries on EFH. Nevertheless, the next cyclical reassessment of the EFH EIS analysis has just begun and may identify an improved or superior model.

Fujioka, J.T. 2006. A model for evaluating fishing impacts on habitat and comparing fishing closure strategies. *Can. J. Fish. Aquat. Sci.* 63:2330-2342

## **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

By and large, analyses and research subsequent to the PSEIS have confirmed its general conclusions. In fact, the PSEIS used much of the same fishing data and an early version of the Fujioka model in its analyses. Both the PSEIS and the EFH EIS identified that fishing reduced habitat features.

The EFH EIS also assessed whether the distribution and intensity of those effects matched with life-history requirements of managed species in a way that indicated that their habitat was affected in a way that was more than minimal and not temporary. That assessment, and a subsequent reassessment in 2009, identified few places indicating that standard had been exceeded. (A specific area of concern for red king crab in the Amak Island area is receiving further review). Appropriately, many assessments indicated substantial uncertainty, primarily due to lack of specific knowledge of the distribution of fish use of habitat features, particularly for juveniles and spawning concentrations. This uncertainty motivated precautionary management actions to reduce fishing effects on habitat. Those actions, and a general reduction in fishing intensity, if anything, may result in some reduction of the estimated effects on reanalysis.

In a similar way, further research studies on the processes that underlie the effects of fishing on benthic habitat, while increasing the specificity and certainty of knowledge, have not demonstrated any

substantial errors in the information used in the 2005 EFH EIS or the PSEIS analysis. A subsequent analysis will provide more specific estimates with less uncertainty, but is not likely reach seriously different conclusions.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/5/13

What resource component is this review for? Socioeconomics

What sections of the PSEIS were reviewed? 4.9-235 through 4.9351; Table 4.10-2b; Table 4.9-6; Table 4.2-2

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

*Have there been substantial changes in the management program that have affected the resource, since the 2004 PSEIS (e.g., species is now managed independently, rather than as part of a complex; implementation of catch share privileges or closure areas affecting fisheries targeting resource)?*

The document (Section 4.9, Socioeconomics pages 235-351, in particular) makes references to increasing the number of fisheries that will be rationalized in the coming years. Since 2004, we have seen the rationalization of AM80 groundfish, the rockfish fishery, and the P. cod freezer longliners. BSAI crab has also been rationalized, though it is obviously not part of the groundfish FMP, but references are made to crab stocks at points throughout this resource component and to excess capacity in the crab fisheries (now essentially gone). As such, much of the speculation about potential rationalization programs, or unrealized benefits or costs of such programs, can be better articulated at this time. Accordingly, statements about unrealized benefits and the amount of those benefits should probably be toned down a bit, as fishery rationalization has already occurred in many fisheries and there is not nearly as much unexplored territory as back in 2004.

Bycatch management in this document could be updated to reflect the new Chinook salmon bycatch IPA's and hard cap as well as Steller sea lion closures.

### 2 Has the status of the resource changed?

*Is the status of the resource different than described in the 2004 PSEIS, and if so, how? What has affected the change in status? Is the current status within the range of variability analyzed in the 2004 PSEIS?*

The document makes reference to projected trends in particular species repeatedly in different parts of this section (there are too many instances to mention; this document restates much of the same information and conclusions in each section of the Socioeconomics portion). Basically, you'll need to read through the specific references to species trends and see if the projected trends based upon the information in 2004 have played out. Similarly, references are made to the impacts of climate change and I believe we have seen more of the impacts of climate change since this document was published.

Specific statements that appear repeatedly and should be checked include:

- \*Downward trends in salmon and crab fisheries
- \*Significant decreases in sablefish and rockfish
- \*Large increases in catch of P.cod expected

### **3 Is there new information regarding the impacts of the groundfish fisheries on the resource?**

*Are the fisheries affecting the resource differently than described in the 2004 PSEIS? Is this difference within the range of variability analyzed in the 2004 PSEIS? Has the difference been analyzed in a subsequent NEPA analysis (e.g., the difference in impact is the result of a management change for which an EA or EIS was written)? Is there new scientific information or research indicating or suggesting a change in our understanding of the impact of the fisheries on the resource?*

There are some impacts that the document doesn't address which have become issues of concern for the public and considered by the Council. For example, in the analysis of the preferred alternatives in Section 4.9.9.1.1, there is no discussion of the impacts of rationalization on crew and the concerns that have arisen about the way in which high lease rates affect the financial return or average daily wages for crew members aboard vessels. Sections about "Employment and Payments to Labor" assume impacts are insignificant. It is sort of assumed that crew are not adversely impacted but I think we have seen many crew feel as though their compensation has decreased per day. This may be true and it may be due to excess crew labor relative to boats on the water, but it should be addressed in the document or at least acknowledged.

This section repeatedly makes reference to "model results" that predict changes in vessel landings, by species, with accompanying estimates of changes in catch and revenue. It seems as though whatever model generated these predictions could be updated to reflect data covering the last 7 or so years. I doubt any of the specific estimates (e.g., P.cod is expected to increase by about 29%, 44% or 49% -- different numbers are given in two paragraphs on page 4.9-301 and on page 4.9-321) are likely to be accurate today (errors notwithstanding). It's probably worthwhile noting that the P.cod longline CP fleet has been rationalized.

Comments are also made about decreases in ex-vessel value occurring with rockfish and sablefish, but this doesn't appear to be accurate. There is no recognition of rockfish being rationalized.

Comments are made on 49-308 about what will happen if head-and-gut fisheries are rationalized (and they were through AM80) and one should check to see if the species-specific predictions listed there are accurate or can be updated.

4.9-313 comments about significant reductions in excess capacity among CPs seems overstated, as nearly all CPs are rationalized at this point.

Impacts of salmon closures on Average Cost sections of the document should be included/addressed.

The entire section on Regional Socioeconomic Effects beginning on page 4.9-325 makes very specific statements about community impacts coming from a model. I would recommend running this model with newer data to see if the same trends arise. Given the specificity here, it's likely to be stale.

#### **4 Are there new methods of analysis or protocols for evaluating impacts?**

*Has a new methodology been developed for better understanding or evaluating impacts of the fisheries on the resource? Has that methodology been used in NEPA analyses of management actions affecting the resource, since the 2004 PSEIS?*

You may want to check with AKR staff, but I believe Ben Muse has developed economic impact models for the most recent Steller sea lion closures. The Biop has also been released. There are also published papers describing the impacts of crab rationalization:

Abbott, Joshua K.; Garber-Yonts, Brian; Wilen, James E.; Marine Resource Economics, 2010, v. 25, iss. 4, pp. 333-54

Matulich, Scott C.; Marine Resource Economics, 2009, v. 24, iss. 2, pp. 187-93

Matulich, Scott C.; Marine Resource Economics, 2008, v. 23, iss. 3, pp. 253-71

I recognize that crab is not part of this PSEIS, but there are interesting insights into effects of rationalization on various groups.

#### **5 Would a new analysis using the latest methods and information reach a seriously different conclusion?**

*If new information is available, consider whether taking that information into account would cause you to reach a different conclusion about the effect of the groundfish fisheries on the resource. Provide a rationale if you conclude that it would not, or some discussion if you think this issue needs further investigation. We are not asking for the new analysis to be undertaken, only for you to provide a discussion of whether it is merited.*

I don't believe the fundamental impacts of rationalizing fisheries or closing areas to fishing are incorrect in this document. I believe that the Council has essentially slowly implemented many of the policies laid out in this document and that the basic understanding of the effects of rationalization on overcapacity, efficiency, and the nature of the jobs is correct. However, the document seems to reflect the understanding a decade ago of who would win and lose as a result of rationalization; there are some relatively specific predictions about regional economies and how crew and vessel owners will be affected. There are also very specific model results and statements about species trends that could be updated. I believe that given the number of rationalization programs that have been implemented we don't need to rely on those predictions as heavily today, and could likely appeal to actual results rather than predictions. I think the magnitude of the benefits of the preferred alternatives is likely much smaller today given how much of the fishery has already been rationalized, and we also have a better idea of the economic costs of spatial closures due to work done by regional economists estimating, for example, the costs of Steller sea lion closures.

## Template for PSEIS SIR – review of conclusions in 2004 PSEIS

draft 6/6/13

What resource component is this review for? Ecosystems

What sections of the PSEIS were reviewed? 4.9.10

Please answer the following questions with respect to the resource component in question.

- Please provide rationale and discussion of your response, while at the same time keeping it fairly succinct.
- Where appropriate, reference other documents where analysis can be found in detail.
- Responses can be written out, or in bullets.
- In most cases, we are expecting something in the range of 2-5 pages for a particular resource component.

### 1 Has management of the resource changed?

No.

### 2 Has the status of the resource changed?

The Ecosystem Indicators of status, including energy flow, diversity, aggregate top predators, and forage fish have been monitored through the annual publication of the Ecosystem Chapter in the SAFE (e.g. Zador et al. 2012). This has monitored short-term changes in properties – for example, forage fish biomass was significantly below average for 2004-2008, and has since returned towards average. There is no evidence that these variations are outside short or medium-term (3-5 year) range of natural variability as measured over the last 30 years.

### 3 Is there new information regarding the impacts of the groundfish fisheries on the resource?

There has been substantial new world-wide research (e.g. comparisons between ecosystems) on energy flow within ecosystems, for example, the importance of trophic structure or necessary minimum forage fish biomass required to feed top predators within ecosystems. However, this information does not suggest that impacts of the groundfish fishery on the Alaska ecosystems specifically (BSAI and GOA) have significantly changed. Impacts on ecosystems have been analyzed in multiple EAs on specific management changes and no significant differences have been noted in those EAs.

### 4 Are there new methods of analysis or protocols for evaluating impacts?

Significant improvements have been made to monitoring critical aspects of the ecosystem through the development of annual Ecosystem Assessments and Report Cards (e.g. Zador et al. 2012). Furthermore, these improvements have been carried forward into Management Strategy Analyses (MSEs) of the impacts of management strategies on different ecosystem aspects. The ecosystem research is currently being developed within the Alaska Fisheries Science Center as an extended Integrated Ecosystem Assessment (IEA) program to provide data for 'end to end' models that connect climate variability to groundfish and salmon (Chinook and chum; prohibited species catch) recruitment. The modeling effort and ecosystem data provide a formal method for evaluating climate impacts on Alaska's large marine ecosystems.

**5      Would a new analysis using the latest methods and information reach a seriously different conclusion?**

No. The new research and information will enable improved monitoring of the ecosystem research, but to date does not suggest that the conclusions of section 4.9.10 would differ substantially.

Ref: Zador et. al. 2012. Ecosystem Considerations. *In*: Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands regions. North. Pac. Fish. Mgmt. Council, Anchorage, AK.