Marine Conservation Alliance

promoting sustainable fisheries to feed the world

Seattle Office
4005 20th Avenue W, Suite 115
Seattle, WA 98199

Juneau Office
2 Marine Way, Suite 227
Juneau, AK 99801

(907) 523-0731 phone
(206) 260-3639 fax

October 1, 2012

ATTENTION: Wesley Patrick

National Marine Fisheries Service, NOAA

1315 East-West Highway

Room 13436

Silver Spring, Maryland, 20910

RE: Comments on Advanced Notice of Proposed Rulemaking for revisions to National Standard 1 Guidelines

Dear Mr. Patrick,

The Marine Conservation Alliance (MCA) would like to express its gratitude to the National Marine Fisheries Service for the recent Advance Notice of Proposed Rulemaking (ANPR) regarding the National Standard 1 Guidelines. We appreciate the opportunity to comment and applaud the agency for asking for input on this important and very complex matter.

MCA is a broad based coalition of seafood harvesters, processors, fishing dependent coastal communities, and western Alaska Community Development Quota (CDQ) organizations involved in the Federal groundfish and shellfish fisheries off Alaska. MCA was formed to promote the sustainable use of North Pacific marine resources by present and future generations. MCA supports research and public education regarding the fishery resources of the North Pacific, and seeks practical solutions to resource conservation issues.

In the analysis attached to this cover letter we have addressed most of the questions outlined in the ANPR in addition to other matters we feel should be addressed. We have also taken it upon ourselves to offer up what we believe are suggestions which could clarify and simplify the existing guidelines. We hope that our recommendations and accompanying analysis are helpful.

Sincerely,

Merrick Burden
Executive Director

Contents

1. Executive Summary

The existing National Standard 1 Guidelines are rooted in the intention of preventing overfishing. The guidelines argue that the only way to truly prevent overfishing is to account for the uncertainty that exists in science and in management, and that acceptable fishing levels must be reduced in the face of this uncertainty. The resulting construct is a management framework which appears to prevent a Council from ever achieving the goal of Optimum Yield.

The problems that arise from the existing framework appear to start with some confusion over the definition of certain terms, including the definition of overfishing. Adequately defining overfishing is critical to the structure of the National Standard 1 Guidelines since this definition creates one of the principle (and arguably most important) standards by which fisheries management shall be based.

As outlined in their paper "When is Overfishing Underfishing", Cunningham and Whitmarsh (1981) conclude that

> *"Overfishing by one definition may be underfishing by another, and it is concluded therefore that anyone using the term overfishing ought, as a matter of course, to define it."*

It appears that the existing National Standard 1 Guidelines create a perfect case study supporting these conclusions from several decades ago. The guidelines essentially define overfishing as knowingly or unknowingly exceeding the OFL specified for one year, while the MSA states that overfishing is a rate of harvest that jeopardizes the ability to generate MSY. The two definitions are not the same. The MSA definition can essentially be thought of as a level of harvest that is too high over several years rather than one year.

By establishing that the OFL is a one year level of harvest that can never be exceeded, catch tends to default to a level over time that is less than the OFL. By extension then, catch is less than the MSY over time. When the existing approach to reduce catch in the face of uncertainty is layered on top of the "thou shalt not exceed the OFL" policy, catch over time becomes even less than the MSY. In other words, the existing guidelines create a situation of underfishing when the MSA definition of overfishing is used. While this is not necessarily bad per se, it is important context when considering the role of uncertainty. It is also important context depending upon the level of harvest which generates OY. Depending upon how uncertainty is

dealt with and where the OY has been established, the existing guidelines may create a situation where OY cannot be attained.

The hyper-sensitivity that exists toward exceeding the OFL – either knowingly or unknowingly – in the existing guidelines leads toward a complex framework for dealing with uncertainty in one year. The complex framework which exists in the current guidelines does not appear necessary and appears to be based upon two principle assumptions which ought to be reconsidered. If corrected, these two foundational issues could allow for many of the other issues which NMFS has raised to be addressed constructively. The two foundational principles which ought to be reconsidered include:

1. The assumption that MSY, OY, and overfishing are annual events rather than long term average or multi-year events
2. The assumption that the only way to address uncertainty in this one year approach is to reduce catch.

If these two founding principles are reconsidered, it appears possible to prevent overfishing, attain OY, and also deal with uncertainty that exists in science and management – and perhaps deal with it more effectively. Catch need not be reduced in order to deal with uncertainty. Similarly, the tension between the goal of achieving OY and preventing overfishing that is in the current guidelines does not need to exist.

In addition to commenting on the concept of overfishing and uncertainty, we also provide several comments on the cases where fishing is not the driver of stock status, and cases of rebuilding where no apparent causal link appears to exist between fishing mortality and rebuilding time. In these cases, existing policy holds the industry accountable for stock status and rebuilding success even when it has no apparent role in either case, leading to negative economic impacts which do not appear necessary or warranted. We suggest that NMFS convene a panel to explore harvest control rules for cases like these, in addition to other matters.

In the next several sub-sections we outline some of our basic recommendations for modifying various aspects of the existing guidelines. Detail describing how these recommendations were arrived at follow this executive summary.

1.1. Point 1: NMFS Needs to Reconsider and Revise Definitions Related to Overfishing

Maximum Sustained Yield and Optimum Yield are defined as long term averages for the fishery. Overfishing is defined as a level of fishing which jeopardizes the ability to maintain MSY over time. This means that *true* overfishing is better thought of as the compounded effect of harvest levels that are too high over time rather than an annual event.

Based on text within the existing guidelines, the current framework could lead to a situation where the following conditions could hold:

$$MSY = OY = OFL = ABC = ACL = MFMT = ACT$$

This is problematic as this definition forgets that MSY and OY are long term averages, while the other factors are annual events. A more appropriate construct would be to separate these terms like the following:

Long Term Averages	Annual Thresholds
MSY OY	OFL ABC ACL MFMT ACT

When thought of in this way, the definition of overfishing is corrected so that it is viewed as being more akin to a multi-year issue than an annual one. Similarly, the role that uncertainty plays in the context of unknowingly overfishing – and what to do about that uncertainty – changes and can be thought of differently.

- To remedy many of the issues NMFS has raised, definitional issues related to overfishing need to be corrected.

1.2. Point 2: Acknowledge that Uncertainty can be Dealt With in Many Ways

There are many possible ways to deal with uncertainty, including the one way that the guidelines describe dealing with it. However, since the existing guidelines forget to distinguish between annual and long term average measures of acceptable fishing levels, it is difficult to consider these other methods. When this issue is corrected, as is described above, it becomes easier to deal with uncertainty in a variety of ways. The result is that catch need not be foregone to deal with uncertainty, tools can be developed with are better in both an economic and biological sense, and the conflict that exists in the current guidelines regarding preventing overfishing and achieving OY can be avoided.

- NMFS should abandon the singular method of dealing with uncertainty that is currently in the guidelines in favor of a suite of methods to be used for addressing uncertainty.

1.3. Point 3: The Management Construct Should be Simplified

By acknowledging that there are several ways of dealing with uncertainty, management can be fine-tuned to deal with that uncertainty and avoid conflicts between preventing overfishing and achieving OY. Furthermore, the management regime can be simplified in a way that may resemble the following:

Long Term Averages	Annual Thresholds
MSY OY	OFL ABC TAC

- After correcting for definitional issues and recognizing that uncertainty can be dealt with in many ways, NMFS should simplify the number of management thresholds in the guidelines.

1.4. Point 4: Stocks in a Fishery and Stocks Complexes are Related to the Risk of Overfishing

Stocks that may need to be incorporated into an FMP can be boiled down to those stocks where a risk of overfishing a stock in the absence of management may exist. Management for other stocks may also be warranted, such as those stocks which play an ecological role such that management may be necessary for ecosystem-based conservation measures, but these stocks need not be in an FMP. Guidelines which direct Councils to incorporate stocks within an FMP based on the risk that overfishing could occur would provide a simple and straightforward approach and would tie the existence of management measures to standards within the MSA. Other scenarios exist such as stocks which are not targeted but which may play an important role in the ecosystem, or stocks which are caught as bycatch and are included in another FMP. Each of these examples may need management measures of some kind, though they may not need to be placed in an FMP, or in the FMP of the fishery that is not targeting them.

- It is the risk of overfishing a stock which ought to determine whether it is in an FMP, not whether it is retained. Secondly, stocks which may play an important role in the ecosystem, or which are found in another FMP, may need some conservation and management measures and the guidelines should allow for that.

1.5. Point 5: A Multi-Year Approach may be Appropriate if it is Formulaic

Considering overfishing in the context of a multi-year average conceptually makes sense as true overfishing is better thought of as a multi-year event than it is an annual one. However, when considering a multi-year approach there is a need to protect mankind from itself so that he is not tempted to overharvest year after year with the promise that catch will average down the next year.

- A formulaic method may be one approach to a multi-year management system. One good example is a quota roll over in an IFQ program.

1.6. Point 6: Guidelines Should be Modified to Better Allow for EFPs

The existing guidelines cause the fishing industry to essentially choose between fishing or research. This has not always been the case. In the past, the North Pacific process debited EFP catch from the subsequent year's assessment and this model was widely deemed to be sustainable. The current approach takes EFP fish out of the ACL, causing the industry to choose between research or fishing activity. Reducing research activity, such as that done through EFPs, threatens to slow down the development of new technology and with it advancements to sustainable fishing practices.

One alternative to considering the allocation of fish for EFP purposes is to ask the SSC to consider approving such allocations of fish in a separate decision from the TAC specification process. In this consideration, the SSC would consider whether such EFP allocations would appreciably increase the risk of overfishing. Another alternative is to return to the method of debiting EFP fish from the subsequent year's assessment.

- NMFS should reconsider how EFP fish are counted so as not to stymie further innovations in fisheries management. One approach is to ask the SSC whether EFP allocations appreciably

increase the risk of overfishing. Another is to debit EFP catch from the subsequent year's assessment.

1.7. Point 7: ACLs Should be Applied Differently for Highly Variable and Environmentally-Driven Stocks

Certain conditions exist where fishing cannot be considered the driving factor which determines stock status. These include stocks which are highly variable, and stocks which are driven substantially more by environmental factors than fishing. In these cases, fishing might be thought of as an opportunistic activity that capitalizes on yield when it is available. An appropriate approach here might be to consider a population minimum for these stocks where everything above that minimum is yield to the fishery. Such an approach has been taken in Alaska salmon where escapement up river systems is the management goal and populations above those escapement levels are viewed as yield. Alternative methods should be explored for managing species such as these to determine whether a better approach exists.

- NMFS should convene a panel to explore alternative harvest control rules for highly variable and environmentally driven stocks.

1.8. Summary Comments on Rebuilding Progress

Progress toward rebuilding can deviate from expectations due to factors outside a Council's control or due to projections of stock rebuilding time that prove to be inaccurate. In cases like these where rebuilding has not occurred according to expectations, rather than faulting a Council for inadequate rebuilding progress, Councils should be asked to revisit their rebuilding plans based on new scientific information.

Requiring that rebuilding take place within 10 years if it can is arbitrary and will – at some point – cause a fishery (or fisheries) to be completely closed because available science says rebuilding within 10 years is possible. This will be an economic disaster and yet one rationale for this 10 year standard is a perceived economic benefit. The rebuilding standard should be modified to link back to the biology of the species rather than an arbitrary ten year standard. The concept of Tmax is one such example.

The lack of policy guidance for rebuilding beyond ten years essentially begs for perpetual litigation to occur. Rebuilding is mandated to occur, partially due to the assumption that economic benefits will accrue from rebuilding. In extraordinarily long rebuilding times, this economic benefit simply does not exist. Policies for rebuilding in these extremely long cases should be thought of differently.

In cases where fishing has very little or no impact on the success or rate of rebuilding, NMFS should develop a policy whereby a Council merely needs to show that impacts to that stock are de minimus. Forcing a Council to revise rebuilding plans when there is no apparent causal link between fishing and rebuilding success does not make sense.

1.9. Comments on Issues Specific to the Alaska Region

In the Alaska region the Groundfish FMP contains a policy where the fishing rate that determines the OFL automatically declines toward zero when B/Bmsy is less than one. This "kinked OFL" policy results in an OFL that is different (less than) than the maximum allowable fishing level that would be identified by an assessment. The term "OFL" in this case takes on a different definition than the definition that exists in the guidelines. This definition created from

this kinked OFL policy is better thought of as a rebuilding strategy for stocks with abundance levels that are less than desirable rather than a harvest level that – if exceeded – would cause the stock to decline. We suggest that the agency acknowledge when this kinked OFL harvest policy is being used to define the OFL. Exceeding an OFL established under this policy may not be the same thing as overfishing.

Finally, TACs specified to keep BSAI groundfish fisheries under the 2 million ton cap should not be confused with ACLs established to prevent overfishing. Often times TACs set in accordance with the cap are substantially lower than the OFL specified by an assessment and as a result exceeding one does not pose an overfishing risk. TACs set in accordance with an OY goal should not be confused with ACLs designed to prevent overfishing.

2. Our Main Concerns and How the Document is Organized

While we greatly appreciate the opportunity to respond to the ANPR on NS 1, we feel that NMFS should consider other issues that are in addition to the questions posed in the Federal Register Notice. First and foremost, we believe that NMFS should reconsider some definitional issues related to overfishing and MSY, and secondly, we believe NMFS should then reconsider the manner in which uncertainty can and should be dealt with.

Our comments start with a review of the Legal and Policy context, including relevant Congressional history, which appears to indicate that the agency has not appropriately designed the NS 1 guidelines according to Congressional intent. We follow this Legal and Policy context section with an analytical review of what "overfishing" truly is and how uncertainty can be dealt with more optimally than the current guidelines allow. The result is a simpler management construct than currently exists in the guidelines.

By correcting several definitional issues and acknowledging that uncertainty can be dealt with much more broadly, many of the questions NMFS has raised can be easily addressed. Our recommendations regarding how to do so follow.

3. The Legal and Policy Context

The Congressional purpose in enacting the MSA was to protect U.S. fisheries from overfishing by foreign fleets operating off our coasts and to develop the U.S. fishing industry. See S. Rep. 416, 94th Cong., 1st Sess.; H. Rep. 445, 94th Cong., 1st Sess. Nowhere in the Committee reports or the floor debates is there any indication that fisheries were to be managed except for the purpose of protecting resources so as to benefit the U.S. fishing industry. The MSA has been amended over the years, but its fundamental purposes set forth in Section 2(b), 16 U.S.C. §1801(b), remain the same. Those purposes include "to promote domestic commercial and recreational fishing," to provide for the implementation of fishery management plans ("FMPs") that "will achieve and maintain ... the optimum yield from each fishery," and "to encourage the development by the United States fishing industry" of underutilized fisheries. 16 U.S.C. §1802(b)(3), (4), (6). Congress later amended the MSA to add a purpose of promoting the protection of essential fish habitat in order to conserve fish resources for use. 16 U.S.C. §1801(b)(7).

Similarly, the MSA National Standards provide that FMPs shall prevent overfishing while achieving optimum yield from each fishery "for the United States fishing industry." 16 U.S.C. §1851(a)(1). The definition of OY confirms the fundamental purpose of the MSA by providing that fish stocks should be at "a level consistent with producing maximum sustainable yield" in

the fishery. 16 U.S.C. §1802(33)(C). The MSA does not define maximum sustainable yield ("MSY"). However, the National Standard 1 Guidelines define MSY as "the largest long-term average catch that can be taken...." 50 C.F.R. §600.310(e)(1)(i)(A). In other words, the MSA is focused on achieving sustainable harvests and preventing overfishing.

3.1. Legal Issues Related to the National Standard 1 Guidelines

The Advance Notice of Proposed Rulemaking ("ANPR"), 77 Fed. Reg. 26238 (May 3, 2012), requests comments on 11 issues. However, the National Standard ("NS") 1 Guidelines require a more fundamental review of their underlying premises and provisions.

The Preamble to the Final Rule implementing the revised NS 1 Guidelines ("Preamble") states the purpose of the revisions is to incorporate into the Guidelines the new requirements in the Magnuson-Stevens Fishery Conservation and Management Act ("MSA") regarding annual catch limits ("ACLs") and accountability measures ("AMs"). 74 Fed. Reg. 3178 (Jan. 16, 2009). The Preamble states the revised Guidelines will also clarify the relationship between acceptable biological catch ("ABC"), maximum sustainable yield ("MSY"), optimum yield ("OY"), and other reference points. Id. The revised NS 1 Guidelines fail to clarify these relationships, instead introducing standards for which there is no support in the statute or its legislative history.

3.2. The Statutory Definitions

The NS 1 Guidelines define OY by referencing the statutory definition that OY is the amount of fish that:

- will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;
- is prescribed as such on the basis of the maximum sustainable yield from the fishery as reduced by any relevant economic, social, or ecological factor; and
- in the case of an overfished fishery, provides for rebuilding to a level consistent with producing maximum sustainable yield in such fishery.

16 U.S.C. §1802(33), cited at 50 C.F.R. §600.310(e)(3)(i)(A). The Guidelines clarify that OY "is a long-term <u>average</u>" catch such that the NS 1 requirement that FMPs "achieve[], on a continuing basis, the optimum yield from each fishery" means producing "a long-term series of catches such that the <u>average</u> is equal to the OY...." 50 C.F.R. §§600.310(e)(3)(i)(B) and 600.310(e)(3)(ii), citing 16 U.S.C. §1853(a)(1) (emphasis added).

The MSA does not define MSY. However, "[t]he legislative record ... indicates the 'maximum sustainable yield' refers to a scientific appraisal of 'the safe upper limit of harvest which can be taken consistently year after year without diminishing the stock....' H.R. Rep. No. 94-445, at 48 (1975)." *Western Sea Fishing Co. v. Lock,* 722 F.Supp.2d 126, 140 (D. Mass. 2010). The NS 1 Guidelines define MSY as "the largest long-term <u>average</u> catch or yield that can be taken" from a stock or stock complex. 50 C.F.R. §600.310(e)(1)(i)(A) (emphasis added).

After passing the MSA in 1976, Congress amended it to clarify that fishery management plans ("FMPs") shall prevent overfishing. The MSA defines overfishing as a harvest level "that jeopardizes the capacity of a fishery to produce the [MSY] on a continuing basis." 16 U.S.C.

§1802(34). The NS 1 Guidelines then provide that the overfishing limit ("OFL") is the "catch level above which overfishing is occurring." 50 C.F.R. §600.310(e)(2)(i)(D).

3.3. The NS 1 Guidelines Definitions

OY, MSY, OFL, ABC, and ACL

The MSA provides OY is MSY as reduced by any relevant economic, social, or ecological factors. However, the Preamble states: "In some cases, the amount of reduction may be zero...." 74 Fed. Reg. at 3184 (response to comment 8). Thus, OY can equal MSY. The Preamble depicts the OY, MSY, OFL relationship in a graph that shows OFL "corresponds with MSY." 74 Fed. Reg. at 3180. If OY can equal MSY, then OY can also equal OFL. The graph in the Preamble also states that OFL can equal ABC and ABC can equal ACL. *Id.* In other words, under the Guidelines it is possible and allowed that OY = MSY = OFL = ABC = ACL.

Exacerbating the definitional issues in which NMFS uses different terms to describe what is effectively the same thing, is the existence of NMFS' contradictory statements. As noted above, the Preamble begins with a graph that OY can equal ABC. Subsequently, the Preamble states "OY does not equate with ABC" because OY is a different concept. 74 Fed. Reg. at 3189 (response to comment 33).

The NS 1 Guidelines include other terms which also are, or can be, the same thing. Thus, having defined OFL as "the catch level above which overfishing is occurring," the revised NS 1 Guidelines define maximum fishing mortality threshold ("MFMT") as the annual harvest level above which overfishing is occurring. 50 C.F.R. §600.310(e)(2)(i)(B)-(D). However, the Guidelines also state the OFL is the harvest level "that corresponds" to MFMT. 50 C.F.R. §600.310(e)(2)(i)(D). Thus, OY = MSY = OFL = ABC = ACL = MFMT. This definitional jungle can and should be simplified.

Compounding the problem of using multiple terms for the same concepts is the fact that NMFS' definitions create internal inconsistencies. Thus, the Preamble expresses NMFS' belief that overfishing must be prevented on "an annual basis" with the setting of annual limits for OFL and MFMT. 74 Fed. Reg. at 3184 (response to comment 8)(emphasis added). *See also* 74 Fed. Reg. at 3188 (response to comment 28). However, both MSY and OY are long-term average numbers. Inherent in an average is that there will be numbers, *i.e.*, annual harvests, that are higher than and lower than the long-term average. By defining OFL and MFMT as equal to MSY and OY, NMFS has created the definitional inconsistency that the average harvest is the same thing as one year within that average. By conflating annual and average, NMFS compounds the definitional confusion, creating an internally inconsistent management structure. Any review of the NS 1 Guidelines should consider all of these definitional issues. We provide our recommendations about how to resolve these matters in the subsequent section describing an alternative management approach.

3.4. Uncertainty

After providing that OY can equal MSY, OFL, ABC, ACL, and MFMT, the Preamble states NMFS will likely "presume" that overfishing is not prevented if a Regional Fishery Management Council ("RFMC") recommends an FMP in which ACL = ABC = OFL unless the RFMC provides "sufficient analysis and justification." 74 Fed. Reg. at 3180. Under the NS 1 Guidelines, that analysis and justification boils down to how the RFMC addresses uncertainty.

Thus, the Preamble states "NMFS believes that fishery managers cannot consistently meet the requirements of the MSA to prevent overfishing and achieve ... OY unless they address scientific and management uncertainty." 74 Fed. Reg. at 3190 (response to comment 34). However, just as the definitional structure in the NS 1 Guidelines is convoluted, so too is the manner in which uncertainty is addressed.

The graph in the Preamble provides that scientific uncertainty is addressed in setting the ABC such that the "distance" between the OFL and ABC depends on how scientific uncertainty is addressed. 50 C.F.R. §600.310(f)(2)(ii). Consequently, it would appear that the Guidelines are saying OFL = ABC = ACL = MFMT = OY = MSY only if there is certainty in the data. The Guidelines then devote significant attention to how data uncertainty is to be addressed, including both scientific and management uncertainty. The NS 1 Guidelines provide that uncertainty of any description must be dealt with repeatedly, and at multiple levels, effectively dictating "how" a Council and SSC uses the science in front of it, not "whether" they base their decisions on that science.

The effort to graft a specific uncertainty factor or factors onto the best scientific evidence standard is unnecessary. The manner in which uncertainty is best dealt with is a matter of policy preference left to the respective Councils. As discussed below, these "uncertainty" standards set forth in the revised NS 1 Guidelines are nowhere found in the statute or its legislative history.

3.5. P.L. 109-479

P.L. 109-479 created the requirement in the MSA for the specification of an annual catch limit ("ACL") for each fishery. 16 U.S.C. §1853(a)(15). The legislative history is instructive regarding what was intended. The purpose of ACLs is to further the objective of preventing overfishing. The Committee equated the new ACL requirement with the well established and understood concept of total allowable catch ("TAC"). Id. at 6. The Committee was also clear that ACLs should be based on scientific information. Id. at 7. The House Committee Report also stated that catch levels should be based on science. H. Rep. 567, 109th Cong., 2d Sess., at 23. This Congressional intent is reflected in statutory language providing that ACLs may not exceed the level recommended by the Scientific and Statistical Committee of a Regional Fishery Management Council. 16 U.S.C. §1852(h)(6).

The NS 1 Guideline revisions issued in 2009 were in response to P.L. 109-479 which, among other things, added section 303(a)(15), 16 U.S.C. §1853(a)(15), to the MSA. This new section required that FMPs establish a mechanism for specifying ACLs at a level such that overfishing does not occur, including measures to ensure accountability. Neither the statute, nor its legislative history, introduces the concepts of scientific or management uncertainty. Instead, Congress spoke about the need to base decisions on sound science.

The House Committee Report states the legislation would "push fishery managers to take new steps to achieve sustainable fisheries using science-based management...." H. Rept. 567, 109th Cong., 2d Sess., at 25. Similarly, the Senate Committee Report states ACLs "should be set ... based on the best scientific information available." S. Rept. 109-229, 109th Cong., 2d Sess., at 21. As to accountability measures, those too were to be "based on the best scientific information available." *Id.* at 23. The House Report amplified that the objective was to have "a level of harvest that the biomass of the fishery can sustain." H. Rept. 109-567 at 25. Again, that level was to be based on "what the fishery can scientifically sustain...." *Id.* Nowhere is there a suggestion that Congress was creating a system driven by accounting for every conceivable type

of "uncertainty" at multiple levels. What Congress intended was a decision process based on the best science available. Confirming that intent, the House Report stated that a central purpose of the legislation:

> *is to provide a scientific basis for setting harvest levels. This is accomplished by using the example of the North Pacific Fishery Management Council. Under this model and this legislation, all Councils would be required to set their harvest levels based on the recommendation of their Science and Statistical Committees (SSCs). Each SSC would recommend an Acceptable Biological Catch level based on the scientific information presented to the panel.*

Id.[1] There is no statutory purpose or intent for a separate multi-step accounting for data uncertainty. Congress wanted science-based decision making. The model was the process used by the North Pacific Fishery Management Council ("NPFMC"). Rather than follow that model, NMFS created a new model in the NS 1 Guidelines based on data uncertainty. Given the tension between Congressional intent and the NS 1 Guidelines on this point, it may be worth pausing for a moment to consider the legal status of the guidelines.

The MSA is clear the guidelines "shall not have the force and effect of law." 16 U.S.C. §1851(b). Indeed, the Preamble states: "the guidelines are advisory only.... Pursuant to MSA Section 301(b), the guidelines do not have the force and effect of law." 74 Fed. Reg. at 3182 (response to comment 3). Courts have agreed. In *Stinson Canning Co. v. Mosbacher,* 731 F. Supp. 32, 37 (D. Me. 1990), the Court found "[t]he Act states explicitly ... that the guidelines shall not have the force and effect of law. Failure of Defendants specifically to address each of the factors is not, therefore, a violation of law." Other courts addressing issues outside the MSA have also held that the failure to abide by advisory guidelines does not render an action arbitrary or capricious. *E.g., Pharoan v. Bd. of Governors of Fed. Reserve Sys.*, 135 F.3d 148, 156 (D.C. Cir. 1998)(rejecting a claim that the agency's failure to follow advisory guidelines rendered the action arbitrary and capricious); *Duckworth v. United States*, 705 F.Supp.2d 30, 49 (D.D.C. 2011)(ALJ did not abuse discretion by not following NOAA's penalty schedule advisory guidelines because "Defendants have no obligation to justify any departures from them").

In sum, RFMC's are not bound by the NS 1 Guidelines. That is particularly true if the RFMC's are making science based decisions following the NPFMC model envisioned by Congress.

---

[1] Indeed, in the Senate debate over the bill that became P.L. 109-479, the floor manager of the bill, Senator Stevens, stated: "It is important to note the [MSA] has worked well and provided for the effective conservation and management of U.S. fishery resources. For instance, the fisheries managed by the North Pacific Council, which both the U.S. Commission on Ocean Policy and the Pew Oceans Commission lauded as an example for proper fisheries management, does not have an overfished stock or endangered species of fish. It consistently sets an optimum yield far below the acceptable biological catch and as a result the fisheries in its jurisdiction have remained sustainable and productive." 152 Cong. Rec. S6050 (daily ed. June 19, 2006). Upon introducing the bill that was the subject of this floor debate, Senator Stevens used almost these exact words about the North Pacific Council process adding that "[o]ur goal is to build upon this success and ensure sustainability of this resource for generations to come." 151 Cong. Rec. S12851 (daily ed. Nov. 15, 2005).

4. An Alternative Management Foundation

The problem with the existing construct comes down to two key issues:

1. Definitional issues concerning overfishing, and
2. The treatment of uncertainty.

This creates a complex construct of multiple terms and management targets, and at times may virtually guarantee that OY will not be attained. An alternative foundation can be developed which "prevents overfishing" without creating the conflict with OY, while also acknowledging that uncertainty is present and that managing for it is desirable. Here we offer up some alternative definitions as well as an alternative method for dealing with uncertainty. Many of the questions posed by NMFS flow easily from revising these definitions, starting with Question 3 where we offer up a clarification on OY and ACLs.

4.1. Differentiate Long Term Average Yield from Annual Catch Limits

The existing NS 1 guidelines spend a substantial amount of time focusing on the prevention of exceeding the OFL specified for the current year. This heightened sensitivity toward the possibility of exceeding the OFL, or in having a misspecified OFL, is based on the failure to differentiate between the annual specification in a stock assessment and catch rates which threaten MSY over the long term. When combined with uncertainty, the result is a system which can never attain OY.

An alternative management process which clearly distinguishes between annual catch and long term average yield would go far in simplifying management and removing the conflict between attaining OY and preventing overfishing. If it is acknowledged that annual limits are specified as a means to protect the long term ability to generate MSY, then the management approach can be simplified. When combined with a different approach to dealing with uncertainty, the results are simplified even further.

- Long term averages: MSY and OY
- Annual Catch Limits: OFL, ABC, ACT, and/or TAC

4.2. Managing for Uncertainty

The NPFMC has a history of considering uncertainty in its decision making. However, rather than addressing uncertainty in response to National standards or guidelines, the manner in which the NPFMC addressed uncertainty was arguably a matter of policy preference. This preference was based on the best available science and the Council's decision about how to use it.

The current guidelines specify that Council decisions shall always be risk averse and shall be addressed by reducing catch. Herein lies a tension that exists in the existing NS 1 guideline framework. Making decisions based upon the best available science – and perhaps choosing to be risk averse – is a policy choice that is different than specifying how a Council shall use that information and that a Council shall always take a risk averse path by reducing catch from the OFL. The latter effectively acknowledges that the best available science exists, but restricts the Council and the SSC from using it in the best manner possible. This cannot be what Congress intended.

By framing the issue of uncertainty and risk aversion as a matter of policy preference, we can identify factors a Council ought to consider when thinking about how much risk and uncertainty

it is comfortable with and the costs of being wrong in the face of that uncertainty. Some relevant considerations for a Council in regards to its management of uncertainty and the level of risk it deems acceptable include:

1. The level of harvest relative to the OFL over time (does it appear that the fishery actually takes enough fish to cause concern?)
2. The frequency at which the stock will be assessed over time. Frequent assessments allow managers to make a course correction if it is decided that harvest policies are too aggressive
3. The productivity of the stock and the ability of that stock to recover in the face of unexpected mortality events, or fishing mortality that is unknowingly too high
4. The role of the species in the ecosystem (is it an important stock for other predators, or does it play an important predatory role?)
5. The long term economic importance of the stock to the fishery (is this a stock the fishery relies heavily on over a long term period?)

The current guidelines could be improved by asking Councils to consider a variety of factors as they contemplate how to deal with uncertainty present in the data. In the sections below we recommend several ways to consider dealing with uncertainty. This includes more explanation of some of the five factors identified above.

4.3. Acknowledge that there are more ways to deal with uncertainty

The existing guidelines specify that uncertainty can only be dealt with by reducing catch from the OFL. This appears to be driven by the hyper-sensitivity toward the possibility of unknowingly exceeding the OFL specified for that year, or the possibility that the OFL is misspecified. Regardless, there are more ways to deal with uncertainty. Some of these ways are undoubtedly superior tools in some instances. At least three ways for dealing with uncertainty are:

- Avoidance: reduce catch from the OFL, as is described in the existing guidelines
- Adaptation: prioritize assessment resources toward those stocks that experience relatively high fishing levels compared to the OFL. This allows the Council to adapt fishing mortality levels more quickly should a stock begin to decline, and avoid jeopardizing the ability to generate MSY
- Resilience: utilize tools that enhance a stocks resilience to unacceptably high levels of fishing pressure, or exogenous shocks which reduce populations

Another possible tool is the use of Decision Theory, an approach which looks at values, probabilities, and other factors relevant to a decision and seeks to identify the optimal outcome.

What is most important is that the tool used for addressing uncertainty be a match to the sources of that uncertainty and possible implications of being wrong. Therefore, it is important that the Councils are able to use a variety of tools for addressing uncertainty rather than being limited to only one tool.

4.4. Manage for Uncertainty when it Matters

Often times catch is well below the estimated OFL year after year. In these cases, the ability to generate MSY due to the compounding effect of exceeding a misspecified OFL doesn't exist.

Therefore dealing with uncertainty is not necessary because the fishery is not catching fish at a level that justifies concern. It is cases where the fishery routinely approaches or meets the OFL that taking uncertainty into account matters.

4.5. Question 3: ACLs and OY (Simplification of Management Thresholds)

The existing guidelines create a system where the following conditions could hold:

OFL = ABC = ACL = MFMT = OY = MSY = ACT

This complex system of six different thresholds creates complexity and confusion which is not necessary. It is also arguably inaccurate when one considers that some of the terms above are long term averages, while others are better described as annual targets or thresholds. In the table below we separate which of these terms are better considered as long term averages and which are better considered annual concepts.

Long term average concepts	Annual concepts
• MSY • OY	• OFL • ABC • ACL • MFMT • ACT

Variation will occur around the long term mean and therefore the annual harvest targets will almost always be different than the long term average. The OFL could be described as the output from a given stock assessment where that output is the maximum harvest level that could be deemed sustainable in that year. However, since the outputs from an assessment will undoubtedly change each year due to a wide array of factors that may be independent of fishing, the OFL will also change each year even though the long term average MSY may not. In the existing guidelines, each of the other factors in the right hand column is related to OFL in some way, and therefore they are also annual concepts.

Each of the thresholds on the right side of the table above are annual thresholds which are designed to limit catch in some way. One could say then that they can generally be described as "Annual Catch Limits" of some kind. However, the main difference between them is the manner in which they deal with uncertainty if one follows the existing guidelines. What is perplexing however is that the MSY and OY are established long term average goals for the fishery, but – aside from the OFL - the current definition of those factors on the right side of the table does not appear to line up with either of these concepts. In other words, while the OFL is the simply the annualized version of the MSY, a similar concept does not appear to exist for OY.

Consider that uncertainty can be dealt with in several ways, especially when MSY and overfishing are thought of as long term averages rather than annual events. Accordingly, uncertainty and the implications of it can be thought of on a longer term basis. When this is done, risk and uncertainty can be dealt with through several different vehicles. This allows for a simplification in the management thresholds that are defined for the fishery:

Long term average concepts	Annual concepts
• MSY • OY	• OFL • ABC • TAC

In the table above, ACL and MFMT have been dropped. MFMT has been dropped because it is redundant; the ACL concept has been dropped because OFL, ABC, and TACs are defined as annual limits.

New Definitions:

> OFL: An annual catch limit that is the result of a stock assessment's estimate of maximum permissible fishing mortality. This measure is the annual equivalent of the MSY.
>
> ABC: An annual catch limit that is equal to or lesser than the OFL and is reduced for the presence of scientific uncertainty if it is deemed desirable to do so. This calculation relies on stock assessments being risk neutral and transparent and in the clear identification of sources of uncertainty.
>
> TAC: A level of harvest that may be less than or equal to the ABC and is reduced for social, economic, or ecological reasons.

4.6. Recommendations

- Reconsider the definitions of overfishing, MSY, and OY particularly as they relate to long term average concepts rather than annual ones.
- Acknowledge that there are more ways to deal with uncertainty than simply a reduction in catch.
- Consider a simplified management approach which could have the following definitions and which are intended to remove the conflict between preventing overfishing and achieving OY:

Long term average concepts	Annual concepts
• MSY • OY	• OFL • ABC • TAC

New Definitions:

> OFL: An annual catch limit that is the result of a stock assessment's estimate of maximum permissible fishing mortality. This measure is the annual equivalent of the MSY.
>
> ABC: An annual catch limit that is equal to or lesser than the OFL and is reduced for the presence of scientific uncertainty, should the Council elect to reduce catch when faced with uncertainty. This calculation relies on stock assessments being risk neutral and transparent and in the clear identification of sources of uncertainty.

TAC: A level of harvest that may be less than or equal to the ABC and is reduced for social, economic, or ecological reasons. This measure is intended to be the annual equivalent of the OY.

5. Question 1: Stocks in a Fishery

Stocks identified as being "in a fishery" should relate to whether there is a risk of overfishing that stock. The ability to specify an ACL, or the fact that retention is occurring are not sufficient justification.

There is almost a default presumption that when and if an individual species' ACL can be specified, it shall. In a world where management practicability and economic impacts don't matter, specifying ACLs for every species would be a fair goal. However, these factors do matter and therefore we must consider the ACL management construct with management practicability and economic flexibility in mind.

Management practicability and economic flexibility that is necessary for the fishing industry are affected by the number of individual ACLs established for a given fishery. As the number of ACLs grows the complexity of the management system increases. This places additional burden on managers and additional resource draw out of the management agencies. As the number of ACLs grows, the industry also deals with a similar complexity. Industry also faces the added prospect of having a premature fishery closure due to the potential inability to stay within those multiple ACLs and/or reaching or exceeding an ACL. In other words, the more ACLs are specified, the greater the chances of a fishery reaching one of the limits, which leads to a reduction in economic returns to the fishery even in cases where overfishing is not occurring.

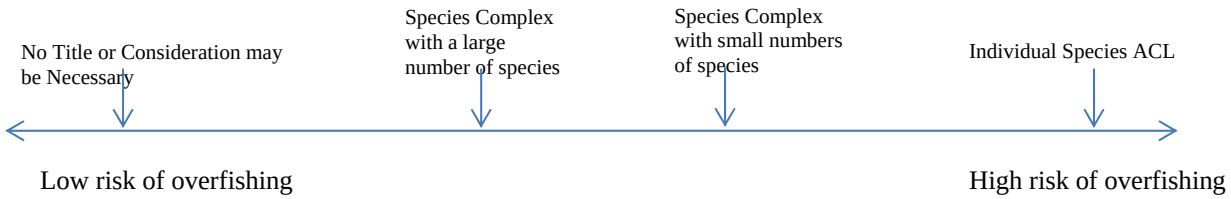
Whether or not the fishery should have a species-specific ACL implemented for that species depends upon the risk of overfishing occurring in the absence of one. Conceptually speaking, the lower the risk of overfishing occurring in the absence of management measures, the fewer number of management measures are necessary to control the catch of that species in the fishery. Inversely, as the risk of overfishing grows, more management measures are needed for that species. With these factors in mind, it makes sense to develop a policy construct which has the effect of limiting the number of ACLs while simultaneously working to prevent overfishing.

5.1. Ecosystem Components, Stock Complexes

The risk of overfishing maps directly to the stock management units that are contemplated in NS 1 guidelines (ecosystem component, stock complexes, individual species ACLs). This concept can be illustrated in the figure below. In this figure, the lowest risk of overfishing is on the left while the highest risk of overfishing is to the right. Where there is essentially no risk of overfishing occurring, management may not need to specify any label at all. For these species there is effectively no risk of overfishing and there is effectively no need for direct management of the species. The exception may be a species that plays an important role in the ecosystem which justifies conservative management of some kind. In this case, the stock may not be "in the fishery" but may deserve some protection for ecological reasons. Those species could be called "Ecosystem Components" and subjected to management even though they are not considered "in the fishery."

As the risk of overfishing a stock grows it becomes necessary to fold that species in to the FMP and establish a management system to control catch, starting with relatively loose measures and growing in to more stringent measures. Where there are slight risks of overfishing occurring,

managing at a group or complex level might be appropriate. As the risk grows somewhat, management tightens and the number of species in that complex becomes smaller either by splitting that complex in to smaller complexes or by removing individual species from that complex. At the highest level of overfishing risk, management specifies ACLs at the individual species level.



5.2. Geographic Separation of Individual Species

The concept described above can also apply to individual species that are being considered for splitting apart on a finer geographic scale. One approach is to specify a single OFL for that species, but to establish finer scale TACs due to ecological reasons such as concern over localized depletion, predator prey interactions, or concern over the stock as prey for another species (Steller Sea Lions and cod for example). The size of the TAC could be based upon the rate of production in each area plus the rate of immigration from another area in to the initial area.

Another approach is to specify two OFLs, two ABCs, and a single TAC. The idea here is that there may be information which indicates there are two different stocks of fish (possibly through genetics for instance), so there is a desire to prevent overfishing on that stock and this requires the identification of an OFL in order to know whether fishing mortality will exceed this level. However, when one looks at the fishery there appears to be a low risk of reaching the OFL or the ABC for any individual stock in either geographic area and therefore a management specification can be implemented across both areas in the interest of management and economic practicability. The two concepts are outlined in the table below.

One OFL, one ABC, two different TACs	**Two OFLs, two ABCs, one TAC**

The approach might be appropriate when the following conditions hold:
- The stock can be defined as a single stock across broad geographic areas
- Ecological concerns exist over geographic exploitation, such as:
  o Localized depletion
  o Role of that species as prey for a predator of concern in a particular geography
TAC specification should not exceed the
	This approach might be appropriate when the following conditions hold:
	- Two stocks are identified, possibly by genetics or similar research
	- The risk of overfishing any one of the sub-stocks is low
	- The combined TAC from both areas is set low enough so as to substantially limit the ability for the fishery to hit any one of the individual ABCs
	As the TAC grows, the need to specify two

productivity of the stock in each geographic area plus the rate of migration from one area to another.	TACs to prevent overfishing either of the individual stocks also grows.

5.3. Recommendations

- Incorporate stocks within an FMP when there is a risk that overfishing will occur in the absence of that incorporation. The ability to specify an ACL, or the fact that retention of a species is occurring, is not sufficient rationale to justify incorporation into an FMP.
- Stock complexes are important tools to retain a manageable number of species management units. Develop stock complexes for those stocks which have a low risk of overfishing. As the risk increases, reduce the size of the complex or specify a species-specific ACL. The ability to specify an ACL should not be seen as a need to do so.
- Allow for the development of management measures for species which appear to play an important role in the ecosystem even when those species are not part of the FMP. Also, allow for the development of management measures for stocks which may be in a different FMP and for which management may be necessary.

6. Question 2 and 7: Overfishing, Multi-Year Impacts, and ABC Control Rules

The definition of overfishing is a rate of harvest which jeopardizes the ability to generate MSY. MSY is a long term average. This means that overfishing is better described as a rate of harvest that is too high over a multi-year period than it is an annual event. In other words, it is the compounded effect of exceeding a stock assessment's maximum allowable fishing estimate that jeopardizes the ability to generate MSY. However, this is not universally true. One year's harvest could be so large as to jeopardize the ability to continue to generate MSY, or the life history of the species is such that one year's catch effects to the ability to generate MSY. Still, it is more often that overfishing is better thought of as a multi-year issue than an annual issue.

The fact that overfishing is truly more of a multi-year concept rather than an annual one creates complexities when it comes to determining whether a stock is "experiencing overfishing" or not. Defining what a "long term average" is for a stock is most likely case specific. For instance, the long term average for a species of fish that live for 80 years will be different from the long term average for a species of fish that lives 3 years. Determining whether a rate of harvest is occurring which jeopardizes the ability of a stock to generate MSY on a case specific basis would simply be impractical. Therefore determining whether "overfishing" is occurring on a case by case basis is impractical. It makes sense to examine catch next to the stock assessment's estimate of maximum allowable fishing mortality as a measure of management performance, as is done now. However, it is important to note that exceeding a stock assessment's estimate of OFL in one year may not be truly "overfishing." This annual definition and measurement is entirely a man-made, regulatory construct.

6.1. A Multi-Year Approach

Conceptually, managing on a multi-year basis could make sense as MSY is a long term average so examining fish harvests on a long term average could be appropriate. However, establishing a management construct which allows for consideration of multi-year impacts rather than annual impacts introduces a policy equation which is not present in the current management (which holds managers to an annual fishing mortality standard). Under a multi-year impact management system, it is not hard to imagine a Council allowing the fishery to exceed the annual estimate of

the OFL with the promise that harvests will go below the OFL in the following year in order to ensure that fishing mortality is, on average, below the level which would jeopardize the ability to generate MSY. This creates a scenario where the sustainability of the fishery relies on the good faith of management to average down the following year and on the ability to hold firm to political pressure that may run counter to that. By holding fishery mortality to annual thresholds, this same policy dynamic does not exist and the default implication is that catch does not exceed the annual OFL or the long term OFL.

6.2. Rollovers as a Means of Allowing for a Multi-Year Approach

However, there may be certain instances where a multi-year approach can be "hard-wired" in a manner that eliminates the "manage-in-good-faith" requirement and ensures that fishing mortality is at or below the OFL on average over time. One can imagine a rather formulaic control rule where, if the fishery exceeds an OFL in one year, then deductions are automatically taken from the fishery the following year. One good example is the concept of a "quota rollover" in a catch share program. For instance, a rollover could allow the unharvested yield from one year to roll into the second year. This may cause the fishery to exceed the annual estimate of the OFL, but the two year catch average would be at or below the sum of the two year's OFLs. Biologically speaking, this occurrence will likely not have impacted the ability of the stock to generate MSY since the average harvest is still at or below the OFL and in this way a multi-year perspective does not lead to "overfishing". Indeed, the PFMC SSC recently stated that rollovers of up to 10% that are done in this manner would have no biological impact on the stock.

The important difference in this example is that the amount of quota rolled over to the fishery is formulaic and that formula must be fixed and not subjected to political whims which may change over the short term. In this formulaic instance, there is arguably more rigidity in the size of the quotas granted to the fishery and this rigidity is tied back to a scientifically acceptable level of fishing mortality. Under this formulaic construct a multi-year perspective may be more durable and management may be able to resist the temptation to exceed an OFL year after year.

6.3. Recommendations

- Consider a multi-year definition of overfishing, but only in cases where it is tied to a formulaic approach that is not subjected to political pressures where managers exceed the OFL one year with the promise of averaging down the next, only to exceed the OFL year after year. One example of an acceptable formulaic approach is a rollover in an IFQ program.

7. Question 5: Scientific Uncertainty and Management Uncertainty

Uncertainty can't be dealt with properly until long term average and annual concepts are differentiated. The ANPR requests comment on how to deal with scientific and management uncertainty, where scientific uncertainty is related to the uncertainty of calculating the true OFL and management uncertainty is the uncertainty of controlling catch so that the catch limit is not exceeded. The premise of this approach guarantees that the attainment of OY will not be achieved. This approach confuses the concept of the OFL (which is an annual concept) with the concept of overfishing (which is a rate of harvest that jeopardizes the ability to attain MSY, a long term average concept). The OFL is arguably an "annual catch limit" which is designed to prevent jeopardy toward the ability to attain MSY, a long term average concept. Establishing the

OFL as a hard limit which shall not be exceeded creates the default effect of limiting harvest to below the OFL, therefore restricting catch levels to less than what is described as "overfishing." Furthermore, uncertainty can be dealt with in many different ways and acknowledging these different methods can be beneficial as it allows management to tailor the uncertainty response to the situation at hand. Mandating that uncertainty only be dealt with through a reduction in allowable catch virtually guarantees a sub-optimal social and economic outcome and may very well result in sub-par biological outcomes in the face of that uncertainty.

7.1. Ways of Dealing with Risk and Uncertainty

It is often desirable to acknowledge uncertainty and to deal with it accordingly. Uncertainty can come from many different factors including uncertainty about a stock assessment model's ability to estimate the OFL, the ability of management to stay within the OFL, and unexpected environmental shifts which may impact the abundance of the stock. The NS 1 guidelines take a very narrow view of uncertainty factors by examining those which are effectively controlled by managers (either the accuracy of the assessment or the control over the fishery). In reality, dealing with uncertainty requires a suite of tools, including the examples mentioned previously. There are policy tradeoffs inherent in each approach, however. One might prefer lower harvests, essentially trading higher harvests over time for longer term stability in harvest; alternatively, one might prefer higher harvests over time which trades fishery stability for wider swings in stock status.

Each approach responds to risk and uncertainty in some manner, but the way in which it is done is based upon a policy preference. The NS 1 guidelines effectively prevent that decision making process.

7.2. When to Consider Risk and Uncertainty

Risk and uncertainty are always present, but in the case of fisheries management, uncertainty matters when catch rates consistently approach the OFL. Uncertainty matters little when catch is consistently well below the OFL. When catch rates are consistently close to the OFL, this raises the prospect that harvests are unknowingly too high and a compounding overfishing effect is occurring which threatens the ability to generate MSY. The compounding risk effect doesn't exist when harvest rates are consistently well below an estimated OFL. The implications are that some species may need to be managed with uncertainty taken into account, while other species do not. Uncertainty does not need to be considered for every species due to management and economic practicability.

7.3. Scientific Neutrality and Transparency

The amount of risk that is acceptable to the fishery is ultimately a policy call. When it comes to the amount of risk aversion that is appropriate in the face of uncertainty, the fishery management Council members need to make the decision. This requires full transparency of sources of uncertainty and the degree of uncertainty. Unfortunately it is too often that stock assessment scientists and agency analysts make precautionary calls that are out of sight of the public and decision makers. This results in application of several layers of precaution, typically unknowingly to council members and the public. To truly manage for uncertainty, stock assessments must be risk neutral and transparent.

Some examples include the specification of selectivity, the estimate of natural mortality, and other parameters. Oftentimes, stock assessment authors or review panels prefer to set factors at a

level such that a precautionary estimate of stock abundance, or stock growth, results from the stock assessment. In order for uncertainty to be dealt with appropriately, these estimates should be risk-neutral and clearly identified for the SSC, the Council, and the public.

7.4. Recommendations

- Acknowledge that there are many ways to deal with uncertainty in addition to the method outlined in the existing NS 1 guidelines.
- Acknowledge that uncertainty doesn't always need to be addressed, especially when a fishery catches far less than the specified OFL.
- We recommend that NMFS implement a policy regarding neutrality and transparency in stock assessment processes and fully document areas of uncertainty. This transparency and documentation will assist managers and the public in grappling with the true tradeoffs that exist and in making the most well informed decision possible.

8. Question 8: Catch Accounting (Experimental Fishing Permits)

Experimental Fishing Permits (EFPs) are used to support research but strict application of Annual Catch Limits (ACLs) has unnecessarily constrained the use of EFPs. These constraints are unnecessary when the proposed EFP does not appreciably increase the probability of overfishing.

EFP research generally promotes important goals of the MSA such as gear modifications that assist in avoiding bycatch and in reducing impact to vulnerable habitat. EFPs have also been used in the development of on-board camera monitoring that allows increased and cost-effective catch accounting. These innovations cannot occur without experimental field testing and modification. are time consuming and often require vessels to fish in areas they would normally avoid and therefore cannot be done as part of normal fishing operations. The agency should rethink its application of ACLs when considering EFPs so that exceeding an ACL (especially when it is set below max-ABC) is permissible based on approval by the SSC when the EFP does not appreciably increase the probability of overfishing.

Currently, the agency requires that an EFP be subtracted from the ACL. This can be problematic for two reasons: 1) If the Annual Catch Target (ACT) is set at the ACL (aka TAC set at ABC) and the fishery is fully subscribed, the EFP allocation will have to be funded from fish that would otherwise have been allocated to fishermen. This will likely diminish support for EFP funding from the fishing community; 2) If the EFP proposal process is not synchronized with the TAC-setting process, the research effort will be delayed, reducing the timeliness of the work.

The focus of our comments will be on NS 1 Guidelines Sections (f) (2) (ii) and (f)(3) which describe the specification of ABC (ACL) as follows:

(f)(2) (ii) Acceptable Biological Catch (ABC) is a level of stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty (see paragraph (f) (3) of this sections), and should be based on the ABC Control Rule.

(f)(3)*ABC may not exceed OFL (see paragraph (e)(2)(1)(D) of this section). Councils should develop a process for receiving scientific information and advice used to establish ABC. This process should: Identify the body that will apply the ABC control rule (i.e., calculates the ABC), and identify the review process that will evaluate the resulting ABC. The SSC must recommend*

the ABC to the Council. An SSC may recommend an ABC that differs from the result of the ABC control rule calculation, based on factors such as data uncertainty, recruitment variability, declining trends in population variables and other factors, but must explain why…

To avoid confusion let's be clear on some definitions as used in the MSA and as applied in North Pacific region:

ABC = ACL and TAC= ACT. MSA requires that a Regional Fishery Management Council's (RFMC) Science and Statistical Committee (SSC) set the ABC and that the Council set TAC at or below ABC to avoid the probability of reaching the Overfishing Limit (OFL). The 1996 amendments to the MSA defined the terms "overfishing" and "overfished" to mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield (MSY) on a continuing basis.

Acceptable Biological Catch (ABC) is defined in section (f)(2) (ii) of the NS 1 Guidelines as follows: *ABC is a level of a stock or stock complex's annual catch that accounts for scientific uncertainty (see paragraph (f)(3) of this section), and should be specified based on the ABC control rule.*

The ABC control rule used in the North Pacific was revised and is defined in Amendment 56 of the BSAI and GOA FMPs. It requires that the ABC (as a target) shift below the MSY (i.e., the catch when fishing at Fmsy) to account for scientific uncertainty. The MSY (or proxy) was then specified as the OFL rather than a target. However, implementation of the ABC relative to the TAC as a maximum limit ensures that the average catches remain below the ABC and that the "target" is always above the actual catches. By extension, this practice results in catches that are substantially more conservative than the OFL limit. Amendment 56 to the Bering Sea Groundfish FMP also revised the default fishing mortality rates for species categorized as tiers 2-6 (which reflect varying degrees of data paucity), making them more conservative and establishing a buffer between ABC and OFL.

The point to be made here is that the regional management councils manage ABC/OFL differently. In the North Pacific, there is precaution to avoid overfishing at many levels resulting in generally large buffers between ABC and OFLs. Strict catch accounting measures in the North Pacific, further enhanced in catch share programs, ensure that ABC overages rarely occur. Requiring EFPs to be counted against TACs when set at ABC would discourage needed research to protect habitat, avoid bycatch and improve catch accounting.

8.1. Recommendations

- Allow EFPs to be funded from fish outside the TAC setting process. Possible methods include:
    - Utilizing the expertise of the SSC and ask them to consider whether funding an EFP appreciably increases the risk of overfishing.
    - Allow the ACL to be exceeded to fund an EFP as long as it does not exceed max-ABC.
    - Include estimates of fishing mortality caused by EFPs within stock assessments. In this way the OFL would be established having already accounted for that possible impact in the biomass estimate.

9. Question 10: ACL Exceptions

The ANPR invites comments on the guidance for exceptions to ACLs. The exceptions outlined in the existing guidelines deals with stocks which reproduce in a year and stocks which are subject to international agreement. While we do not have comments on these two factors, we feel that due consideration is needed for at least two other situations which include:

- When fishing is not the driver of stock status; and
- Highly variable stocks

While a complete exemption from the concept of a catch limit may not make sense in these cases, we believe a sound argument exists to consider these situations differently and to outline a more appropriate method of managing fisheries in these cases rather than assuming some average state of nature exists, and that fishing mortality is the primary factor impacting stock status.

9.1. When Fishing is not the Primary Driver of Stock Status

The existing policy guidance approaches fishery management as if fishing induced mortality on a stock is the driving influence over the population or status of the stock. Certainly, in all cases there is some harvest level which can be a significant determinant of stock status, but in many cases the range of harvest levels being contemplated do not play a significant part in the future population of that stock, or in the current trajectory of that stock's population.

The existing approach to fishery management still places the burden of conservation on the industry, even when the population of the stock is not affected by the harvest rates being considered. A different approach is necessary in these instances that acknowledge that a stock can swing wildly, even shrinking in size dramatically, as part of its natural fluctuation. Indeed, literature is available which indicates that natural variation in a stock can lead to a stock status that is labeled as "overfished" even in the absence of fishing. This is problematic as the industry is burdened with the effort to rebuild a stock when it has had no role in that stock's decline. The industry is doubly harmed by the label that a stock is "overfished" when consumers avoid it in the marketplace. Where a stock has declined due to non-fishing factors, it would be more appropriate to define it as "depressed" rather than "overfished" since the latter title subjects the industry to economic and political harm even when not responsible for the stock's status.

Well known examples of this include sardine, anchovy, crab, and Pacific whiting stocks. Research regarding sardines off the coast of California show huge swings in population over hundreds of years even during times of no fishing. Environmental factors are obviously driving this stock. Under the current policy framework, a natural decline in the population of sardines could result in an "overfished" label, though that decline has had little or nothing to do with fishing at all. The industry is burdened with the mandate to rebuild even though fishing restrictions will have no consequence.

In cases such as these, the concept of a long term average MSY, or OY, is perplexing at best. Similarly, the concept of "overfishing" based upon assumptions regarding the role of fishing in the status of the stock is also perplexing. In such cases, the role of fishing might be better thought of as responding to yield when it is available (i.e. when favorable environmental conditions cause the stock to increase) and capitalize on that yield opportunistically rather than

thinking about a relationship between fishing mortality and productivity. If considered in this way, the concept of an appropriate catch limit and the concept of overfishing becomes different from a stock where fishing is the primary driver of that stock's population. Some type of an exception or variation to the concept of Annual Catch Limits would be necessary to accommodate this type of a reality.

9.2. Highly Variable Stocks and the Concept of Overfishing

Certain types of species exhibit extreme swings in abundance due to natural conditions. The concept of a long term average MSY for these species is perplexing as they are better described as not having an average and not having a measureable unfished biomass level. In these cases, the management approach needs to be thought of differently.

Perhaps rather than aiming for a long term average yield called the MSY, management could focus on a population minimum for these species where any population above that size is yield to the fishery. This would acknowledge that an average yield is not an appropriate benchmark, but a minimum population size would prevent stock depletion while also providing enough spawning biomass to produce yield to the fishery. Such an approach is used in Alaska salmon management where managers target a minimum escapement level up individual river systems and populations above that level become available as yield to the fishery. This approach has been considered a sustainable model of fishery management for decades.

Commercial crab stocks in the Bering Sea are another good example of highly variable stocks. As seen in the charts below, crab stocks exhibit a poorly fitting stock recruitment curve where many strong recruitment events occur from low biomass and many poor recruitment events occur from large biomass. This obviously confounds the setting of reference levels for a stock such as OY, Bmsy and MSST as the years chosen as the "average" for a particular stock are very important. This, coupled with the fact that specific climatic regimes can be positive or negative for crab species helping or hindering productivity create additional complexities.

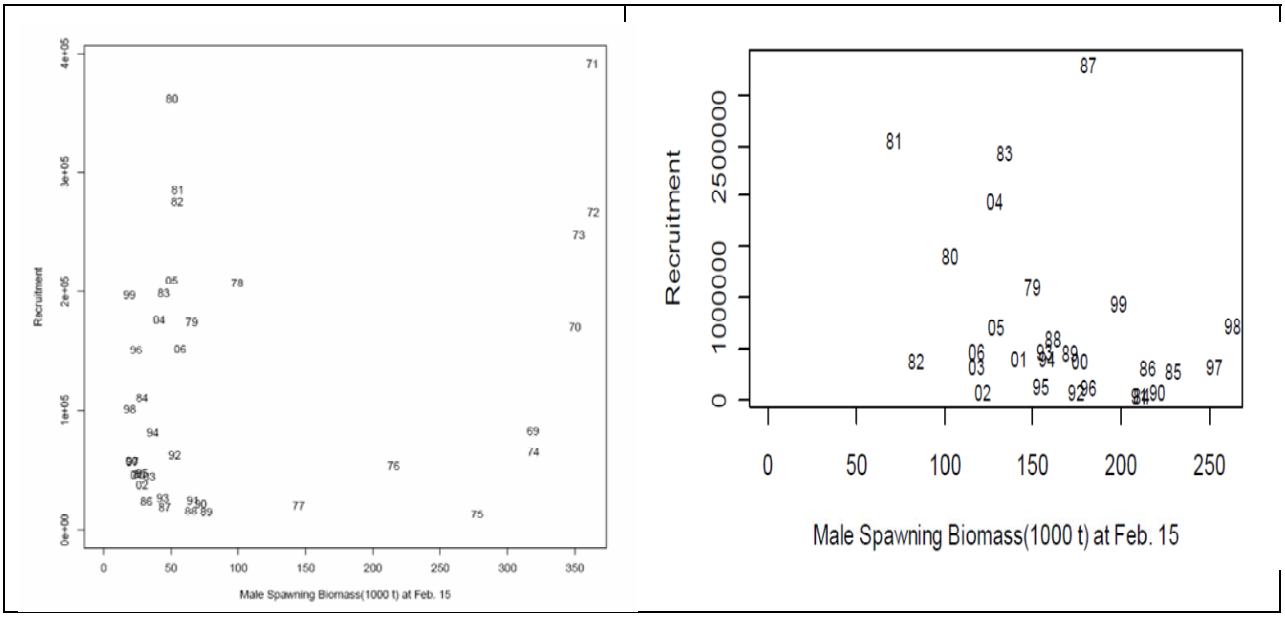


Figure: Male Spawning Biomass vs Recruitment for Bairdi crab (left) and Opilio crab (right)

Managing on the basis of achieving a long term average yield (or MSY) for highly variable stocks is a significant challenge and begs the question of whether that strategy is the best from an economic and biological basis. Other approaches may be better at achieving management goals, such as the concept of a population minimum and a yield that is reflected as a population size that is above that minimum. This approach has been used successfully in other species, like Alaska salmon. However, the idea of a management strategy for a species like crab that ensures the population does not drop below a level that can generate a successful recruitment event is an idea that would require further exploration from the scientific community. For instance, is long term yield to the fishery stabilized under such an approach when compared to status quo? Do additional biological risks become introduced under this approach? And, how does this alternative approach compare to the current way of managing for highly variable stocks? It would be helpful to have a panel of stock assessment modelers analyze this sort of approach on several stocks with high variability to determine if it is a more successful approach.

9.3. Recommendations

- Explore alternative management strategies for stocks that exhibit wide variations in abundance irrespective of fishing, and for stocks which have a population that is largely determined by factors which are exogenous to fishing.
    - One possible concept includes the establishment of a population minimum that would be defined as the minimum population necessary to capitalize on favorable environmental conditions when they present themselves.
    - Questions that could be explored include the biological and economic risks that are posed by this approach compared to the status quo.
- We recommend a panel of scientists and management staff be convened to explore these types of alternative methods for these kinds of stocks.
- We also recommend that an alternative term be used to describe stocks which have a reduced population from a factor other than fishing. We propose the use of the term "depressed" rather than "overfished."

10. Question 11: Rebuilding Progress and Revising Rebuilding Plans

10.1. Changes in Rebuilding Target as a Result of a New Assessment

The term "inadequate rebuilding progress" is not a simple matter to define. The MSA states that Council's shall rebuild as quickly as possible, taking into account the short term needs of fishing communities and the role of the species in the ecosystem. This means that the appropriate speed at which a stock should rebuild is a balance between the biological capacity of the species to rebuild, the needs that fishing communities have in the short term, and the role the species plays in the ecosystem. A Council will make a decision regarding the appropriate rebuilding time based upon the forecasted rate of recovery, and the economic impact of restricting fisheries to foster that recovery. It is almost always the case that the economic impact is easier to define and forecast than the rate of stock recovery.

What is implied in the term "inadequate rebuilding progress" is that the stock has not rebuilt according to the forecast. What is lost in this determination is that the target rebuilding time is about the balance between short term needs of communities and the speed at which a stock can rebuild. It is not just about the speed of rebuilding. In other words, if a stock is not rebuilding at

a rate that was originally expected even though fishing has been successfully constrained to help rebuild the stock, NMFS may wish to ask the Council to reconsider the balance originally struck between speed of rebuilding and the needs of communities. Faulting a council for "inadequate rebuilding progress" when it has successfully managed the fishery based upon the science originally provided would arguably be inappropriate. What is appropriate is to ask the Council to reconsider its policy if the science changes and the original forecast proves wrong.

Related to the term "adequate rebuilding progress" is the event where a stock assessment retrospectively discovers that a stock is overfished, or retrospectively discovers that a stock was never overfished to begin with. Currently NMFS errs on the side of conservation where a stock will remain in overfished status even if new science shows that label was never warranted. This practice is questionable when considering the use of "best available science." NMFS should remove a species from the overfished list if new science shows that an overfished status is unjustified. Similarly, NMFS should place a stock in a rebuilding status if a new assessment shows a stock was overfished and has not yet recovered to "rebuilt" status.

10.2. Rebuilding When Fishing is not the Driver of Stock Status

Implied by existing rebuilding policy language is the fact that fishing is the primary driver of stock status. Oftentimes stock status is determined by factors outside of fishing, such as oceanographic conditions, a loss of habitat, or other factors. In cases like these, following the MSA's guidance to balance the needs of communities against rebuilding time simply cannot be done because the cause and effect relationship between fishing mortality and rebuilding time does not exist. In these instances, NMFS should consider an alternative policy that directs Councils to reduce fishing mortality to a level where it is not substantially contributing to the status or trajectory of the stock rather than asking Councils to make a decision based on the erroneous assumption of there being a causal relationship between fishing mortality and rebuilding success.

One particular example is the Pribilof Island Blue King Crab (PIBKC) stock which has been subject to conservation measures for several years, yet the stock has not rebuilt. According to NMFS' own statements, this stock is driven by environmental conditions and successful rebuilding will depend on those conditions becoming favorable.

> *"Although it is often assumed that a fish stock is overfished due to too much fishing, many other factors can influence the health and abundance of a fish stock. These factors can include natural mortality, disease, natural population cycles, habitat degradation, and environmental changes such as climate, ocean acidification, and land-based pollution. For example, the fishery for Pribilof Island blue king crab has been closed to directed fishing since 1999 and a number of other measures have been implemented to protect this resource, but the stock has made no progress towards rebuilding. This failure to recover is likely due to environmental conditions that are unfavorable to the blue king crab's reproduction and survival rates."*

In examples where fishing mortality has been substantially controlled and any existing mortality is deemed to be de minimus, it may make sense to allow a rebuilding plan to simply be extended, rather than exerting limited resources to a revise a plan that will have little to no impact on stock recovery anyway.

10.3. The Ten Year Rebuilding Requirement

The current ten year rebuilding requirement is problematic for many stocks as it is quite arbitrary. While this is a standard that exists within the MSA rather than the guidelines, we feel the need to comment on this matter here.

The ten year rebuilding standard is not linked to a basic biology of a species. In addition, some of the rationale for this standard deals with the economic assumption that rebuilding quickly makes economic sense. This economic argument is sometimes true at best, but not always. One example is a case where available science shows that a species can rebuild in 9.999 years if all fishing is ceased. Under the existing law, a Council would be required to rebuild that stock and shut down all fisheries that encounter that stock. This would be an economic disaster.

A more appropriate rebuilding standard would be one linked to the basic biology of the species. One example that has been developed is the concept of Tmax, which is described as being "plus one mean generation time." In other words, the time to rebuild is linked to the biological growth of the species rather than an arbitrary 10 year standard. While we do not necessarily fully endorse the Tmax concept, approaches like this one which are linked to the biology of a species should in general be far superior to arbitrary timelines such as the existing 10 year standard.

10.4. Rebuilding Beyond Ten Years

There is very little guidance about how to rebuild in cases where the best available science says it will take more than 10 years. This is problematic in several cases:

- The risk of perpetual litigation as Councils and courts have very little to go on; and
- Where fishing is not the primary driver of stock status, yet is expected to shoulder a conservation burden as if it is.

In the North Pacific we have experience with the Pribilof Island Blue King Crab stock. This stock is not projected to rebuild within 10 years regardless of the amount of fishing that occurs. The available science also shows that varying harvest levels have a very slight impact on the ability of that stock to rebuild. Successful rebuilding will depend upon the presence of favorable environmental conditions, most likely in the form of a cold water regime change brought about by a shift in the Pacific Decadal Oscillation. In this case, the stock may very well continue to decline year over year until favorable conditions present themselves.

While fishing mortality needs to be restricted when the stock is depressed, it is unreasonable to place the entire burden of rebuilding on the industry when a causal relationship between fishing mortality and rebuilding success does not exist.

Secondly, the rationale that rebuilding makes economic sense is unlikely to exist in cases where rebuilding takes significantly longer than 10 years. One example is the case of Pacific groundfish where some stocks are not expected to rebuild for 50 years or more, yet the policy guidance and case law indicates that rebuilding is to be prioritized in the interest of economics. To foster rebuilding, fisheries have been restricted to the point of being declared an economic disaster. Put simply, the economic rationale for rebuilding does not exist in cases where rebuilding will take decades. This is not to say that rebuilding should not occur. Policies intended to rebuild should occur in every case, however extraordinary rebuilding times – and the policies around them – ought to be thought of differently. NMFS should convene a panel to discuss the policy tradeoffs and approaches which might be taken for extraordinarily long

rebuilding times.

10.5. Recommendations

- Rather than faulting a Council for "inadequate rebuilding progress" when management has adhered to management goals, ask the Council to reconsider its rebuilding plan if the underlying science has changed and original projections of stock growth prove to be inaccurate.
- When a stock assessment retrospectively indicates that a stock was never overfished, remove that species from the list of overfished stocks; alternatively, if an assessment retrospectively indicates a stock was overfished and has not yet recovered, place it under a rebuilding plan. Simply put, use the best available science rather than simply defaulting to a precautionary stance.
- In cases where fishing is not contributing to the decline or status of a stock yet it is labeled as "overfished", consider an approach where fishing mortality is deemed to be de minimus rather than asking a Council to develop a rebuilding plan based on the notion of there being a causal link between fishing and rebuilding success which doesn't exist.
- Consider life history characteristics, such as age to recruitment and a Tmax approach as discussed above, as part of a rebuilding plan instead of a strict 10 year window for all stocks.
- Consider the likelihood of a stock rebuilding under current environmental conditions as part of a rebuilding plan, instead of a strict 10 year window for all stocks.
- Convene a panel to discuss the policy tradeoffs and approaches which might be taken for species with extraordinarily long rebuilding times.

11. Topics Particular to the North Pacific Region

11.1. The Kinked OFL Harvest Policy

The Groundfish FMP contains a policy where the fishing rate that defines the OFL declines when the ratio of B/Bmsy is less than one. That rate reaches zero when B/Bmsy is equal to 0.05. In other words, the fishing rate that defines the OFL ramps down when B/Bmsy is less than one, finally reaching zero when that fraction is equal to 0.05. This policy is more akin to a rebuilding strategy than it is a policy that defines a sustainable fishing level. As the acceptable fishing mortality rate is adjusted downward in accordance with this kinked OFL harvest policy, the fishing rate is becoming less than the level which would actually be deemed to be sustainable according to a stock assessment. This means that exceeding the OFL that has been set when B/Bmsy is less than one may not actually mean that "overfishing" is occurring. We recommend that the agency acknowledge when an OFL set in accordance with this kinked OFL policy is different from the level that would be considered "overfishing."

11.1.1 Recommendations

- Acknowledge when OFLs set in accordance with the "kinked OFL policy" is less than the fishing level that would be considered overfishing.

11.2. The "2 Million Ton Cap" and Preventing Overfishing

In 1982, the North Pacific Fishery Management Council adopted Amendment 1 to the Bering Sea and Aleutians Islands FMP, which established a target harvest range of 1.4 to 2 million metric tons (mt) for the BSAI groundfish complex. The OY range was calculated as 85 percent of the cumulative FMP groundfish MSY (1.7 – 2.4 million mt). The 15 percent reduction was

indented to reduce "the risks associated with relying upon incomplete data and/or models which incorporate inaccurate or contestable assumptions." Therefore, the record created for adoption of the 2 million mt OY indicates that risk and uncertainty are addressed not only within the stock assessment process, but also by creating a harvest strategy that further reduces overfishing risks. More recent studies by Mueter sought to estimate a similar figure and arrived at a maximum Bering Sea OY of approximately 2.5 million metric tons, further supporting the notion that the existing OY range is a conservative harvest strategy.

The 2 million mt BSAI OY has also been described as an ecosystem management tool that limits the amount of overall groundfish removals from the BSAI ecosystem. However, individual species TACs are set and managed in a manner that prevents the ability to achieve this 2.0 million ton limit.

Due to the multi-species nature of many Bering Sea fisheries, the TAC specified for any given stock is almost always different from the amount of fish actually needed to achieve OY. Changing environmental and market conditions dictate actual realized harvest ratios.

The Council establishes annual TACs based (in part) on expected harvest amounts relative to other FMP species. However, environmental conditions are often different than expected by the Council, resulting in underharvest of some species, and limiting directed fisheries for others. In other words, during any given year, low TAC amounts for a single species could limit harvests of many others. As complexes are broken into individual species management and individual TACs are set under the OY limit (as is the trend), these problems are exacerbated.

Underestimating TAC needs or intentionally setting low TACs to accommodate other species under the OY cap also results in increased bycatch. As TACs are anticipated to be reached for some species, NMFS managers close these fisheries to directed fishing. If closed species are harvested while prosecuting other fisheries, vessel captains are forced to discard them.

The problems described in this section are the result of constraints imposed on the fishery by NS 1 guidelines that fail to accommodate BSAI OY requirements. The MSA dictates that Councils shall "attain OY while preventing overfishing." However, the current suite of NS 1 guidelines restrict Councils' ability to attain OY and, because TACs set under the OY limit are not necessarily intended to reduce risk of overfishing, unnecessarily result in conflicting mandates.

11.2.1. Recommendations

- Acknowledge that TACs established in conjunction with the 2.0 million ton cap are not the same as ACLs established to prevent overfishing and therefore adhering to a TAC as strictly as an ABC that is designed to prevent overfishing is not appropriate.
- Consider allowing TACs to be established at a more aggregated level, like a stock complex, in order to provide for fishery flexibility while at the same time limiting catch to within 2.0 million tons and working to prevent overfishing.
- Consider that treating these TACs as rigorous as an ACL or ABC increases discards, decreases economic yield to the fishery, and works against attainment of OY, meaning such treatment is in conflict with several National Standards.

12. List of Acronyms

Acronym	Definition
ABC	allowable biological catch: a catch level that is equal to or less than the OFL and is reduced for scientific uncertainty
ACL	annual catch limit: a catch level that is equal to or less than the ABC as reduced for management uncertainty
ACT	annual catch target: a catch level that is equal to or less than the ACL
Bmsy	The population size that generates the largest yield over the long term
BSAI	Bering Sea and Aleutian Islands
EFP	Experimental Fishing Permit
FMP	Fishery Management Plan
Fmsy	The fishing level that generates the largest yield over the long term
GOA	Gulf of Alaska
IFQ	Individual Fishing Quota
MFMT	maximum fishing mortality threshold: see overfishing level
MSA	Magnuson Stevens Act
MSY	Maximum Sustainable Yield: the long term maximum yield that is possible for a stock
NMFS	National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council
NS 1	National Standard 1
OFL	overfishing level: the annual result of a stock assessment's estimate of maximum acceptable fishing mortality
OY	Optimum Yield: a level of harvest that may be less than the MSY due to social, ecological, or economic factors
PFMC	Pacific Fishery Management Council
PIBKC	Pribilof Island Blue King Crab
POP	Pacific Ocean Perch
SAFE	Stock assessment and fishery evaluation
SSC	Scientific and Statistical Committee
TAC	total allowable catch: the allowable level of catch that has been specified for the fishery by the fishery management council
Tmax	A limit on the time allowed to rebuild a stock that is defined by biological factors
Tmin	The shortest time possible to rebuild a stock based on its biology