

Discussion Paper on the FMP for the Salmon Fisheries in the US EEZ off the Coast of Alaska

North Pacific Fishery Management Council

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1 Introduction

Council staff has prepared this discussion paper on the North Pacific Fishery Management Council's (Council) *Fishery Management Plan for the Salmon Fisheries in the United States Exclusive Economic Zone (EEZ, 3-200 nmi.) off the Coast of Alaska* (Salmon FMP) in consultation with the National Marine Fisheries Service (NMFS) and the Alaska Department of Fish & Game (ADF&G). Though the Salmon FMP has been amended nine times, no comprehensive consideration of the management strategy, scope of coverage, or subsequent fisheries data has occurred since 1990.¹ In addition, State fisheries policies and Federal and international laws affecting Alaska salmon have since changed that are not reflected in the current Salmon FMP.² For example, the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the National Standard 1 guidelines (NS1) now require, in most instances, Annual Catch Limits (ACL) and accountability measures (AM) for target species managed under an FMP.³ Therefore, Council staff is preparing the Council to comprehensively review the Salmon FMP in order to consider various options for the direction the Council would like to take with respect to the role of its Salmon FMP.

This discussion on the current Salmon FMP is an amalgamation of extensive input from ADF&G, the State of Alaska Department of Law, NMFS Alaska Region, and NOAA General Counsel. This discussion paper focuses on the following areas:

1. Possible options for Council consideration of the future scope of the Salmon FMP: 1) maintain the existing geographic scope of the FMP; 2) repeal the FMP entirely; 3) maintain the FMP in the East Area EEZ only; or 4) modify the FMP to specifically exclude three historical net commercial salmon fishing areas in West Area EEZ from the FMP.⁴
2. Possible Federal legislation to amend the MSA to affirmatively authorize State regulation of Alaska salmon fishing in the EEZ in the absence of an FMP.⁵
3. Satisfying MSA and NS1 guidelines using the State's salmon management program in areas where the Salmon FMP applies.⁶
4. Exempting the stocks managed under an international fishery agreement from the ACL/AM requirements for Chinook salmon harvests under the Pacific Salmon Treaty (PST) in the East Area EEZ.⁷

¹ See *infra* **Table 1** of the amendments to the Salmon FMP.

² Specific examples include: the repeal of the International Convention for the High Seas Fisheries of the North Pacific Ocean/North Pacific Fisheries Act of 1954 (1992); the Sustainable Fisheries Act (SFA, 1996); the Sustainable Salmon Fisheries Policy for the State of Alaska (2001); and the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA, 2006).

³ MSA § 303(a)(15).

⁴ The North Pacific EEZ is divided into two distinct management areas at Cape Suckling (143°53'36" W.), the East and West Areas.

⁵ MSA § 306(a)(3)(C).

⁶ Council staff requested the State provide input on how state salmon management meets an "alternative approach" (50 C.F.R. § 600.310(h)(3)) for satisfying the NS1 requirements of the MSA (July 31, 2010). The State provided its response (Aug. 31, 2010). **Attached.**

⁷ MSA § 303(note); 50 C.F.R. § 600.310(h)(2)(ii) applies to stocks or stock complexes managed under an international fishery agreement such as the Pacific Salmon Treaty (PST). These stocks or stock complexes,

5. Obtain regulatory clarification from NMFS that Alaska salmon fisheries will not be subject to the ACL/AM requirements of the MSA and the NS1 guidelines
6. Updating the Salmon FMP to meet the MSA required provisions in section 303(a) for an FMP.

The MSA is the primary domestic legislation governing management of the nation's marine fisheries.⁸ The MSA requires an FMP to be consistent with a number of provisions, including ten National Standards (NS), with which all FMPs must conform and which guide fishery management.⁹ In addition to the MSA, Federal fisheries management must be consistent with the requirements of other Federal laws; for example, the Endangered Species Act (ESA).¹⁰

1.1 Scope of the Salmon FMP

The fishery management unit of the Salmon FMP is comprised of all waters of the EEZ off the coast of Alaska and the salmon fisheries that occur there.¹¹ The original Salmon FMP (1979) established Federal authority over salmon fisheries in the EEZ but excluded that portion of the EEZ west of 175° E. long.¹² Amendment 3 (1990) extended the jurisdiction of the FMP to the area of the EEZ west of 175° E. long. and expressly deferred regulation of the sport fishery and the Southeast Alaska (SEAK) commercial troll salmon fishery to the State.¹³ Though the Council and NMFS are removed from routine management of salmon fisheries in the EEZ, the FMP asserts and reserves Federal authority and general NMFS and Council participation in and oversight of salmon management in the EEZ.

The FMP includes all five species of Pacific salmon in the EEZ:

1. Chinook salmon (king), *Oncorhynchus tshawytscha*;
2. Coho salmon (silver), *Oncorhynchus kisutch*;
3. Pink salmon (humpy), *Oncorhynchus gorbuscha*;
4. Sockeye salmon (red), *Oncorhynchus nerka*; and
5. Chum salmon (dog), *Oncorhynchus keta*.

The FMP establishes two management areas within its fishery management unit, the East Area and the West Area. The border between the two areas is at the longitude of Cape Suckling, at 143°53'36" W. Sport (or recreational) salmon fishing is allowed in both the East and West Areas. Regulations for salmon fisheries in the EEZ are promulgated by the State.¹⁴ The FMP addresses commercial salmon fisheries differently in the East and the West EEZ, as described below.

however, are required to have status determination criteria (SDC) and a maximum sustainable yield (MSY), which is addressed in the Salmon FMP through the Amendment 6. *See infra* **Table 1**.

⁸ 16 USC. § 1801 et seq.

⁹ MSA § 301(a)(1-10).

¹⁰ 16 USC. § 1531 et seq.

¹¹ Salmon FMP, Section 2.1.

¹² **Figure 1**.

¹³ **Figure 7**; Salmon FMP, Section 2.2. E.g., coho salmon runs in many parts of Alaska are important sport fisheries and have grown substantially in the last few decades. *See* 2009 SEAK/Yakutat Salmon Troll Fisheries AMR.

¹⁴ Salmon FMP, Section 2.2.

1.2 The East Area

The only commercial fishery currently managed in the East Area is the SEAK commercial salmon troll fishery. The SEAK commercial troll fishery in the EEZ is a mixed-stock, mixed-species fishery that primarily targets Chinook and coho salmon; with pink, chum, and sockeye taken incidentally. The FMP sets forth the Council's management goals and objectives for the salmon fisheries in the East Area, which accordingly focuses on the SEAK commercial troll fishery.¹⁵ The FMP defers management of the SEAK troll fishery to the State.¹⁶ **Figures 2 and 3.** Commercial salmon fishing with net gear is prohibited in the East Area.

1.3 The West Area

The West Area is the area of the EEZ off the coast of Alaska west of Cape Suckling. It includes the EEZ in the Bering, Chukchi, and Beaufort Seas, the Arctic Ocean, and North Pacific Ocean west of Cape Suckling. The FMP prohibits commercial salmon fishing in the West Area, except in three historical net areas. The FMP describes these areas in Section 2.2.2 and Appendix C of the Salmon FMP as the Cook Inlet, the Prince William Sound area, and the Alaska Peninsula area, referring to the Cook Inlet, Copper River, and False Pass (South Peninsula) fisheries that are delineated as described below. These three net fisheries are conservatively managed by the State, historically have no record of overfishing, and have not been deemed to require federal conservation and management.

The FMP is vague on the function of the FMP in these areas. Though the FMP broadly includes these three areas and the salmon and fisheries that occur there within the fishery management unit and states that management of these areas is left to the State under other Federal law, the FMP does not explicitly defer management of these salmon fisheries to the State.¹⁷ The FMP does not contain any management goals or objectives for these three areas or any provisions with which to manage salmon fishing. The FMP only refrains from extending the general fishing prohibition to those areas, where, as the FMP notes, fishing was authorized by other Federal law, specifically the International Convention for the High Seas Fisheries of the North Pacific Ocean (High Seas Convention) implemented by the North Pacific Fisheries Act of 1954 (1954 Act).¹⁸ On October 29, 1992, Congress repealed the 1954 Act and implemented the North Pacific Anadromous Stocks Act of 1992 (1992 Stocks Act).¹⁹ The 1992 Stocks Act implements the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean (Conservation Convention), which replaced the High Seas Convention. However, the 1992 Stocks Act and the Conservation Convention do not specifically authorize State managed net fishing in these three areas as previously authorized under the 1954 Act. Therefore, the FMP's reference to "other Federal laws" may no longer be fully effective.

¹⁵ Salmon FMP, Section 4.2, including subsections.

¹⁶ The Southeast Alaska (SEAK) fishery includes waters in State Region 1 and Federal waters east of Cape Suckling. The State Districts where commercial salmon fishing is allowed in the EEZ are: 150, 152, 154, 156, 157, and 189. **Figures 2 and 3.**

¹⁷ Salmon FMP, Section 2.2.2.

¹⁸ Salmon FMP, Section 2.2.2.

¹⁹ The North Pacific Anadromous Stocks Act of 1992, Public Law 102-567, is codified at 16 USC. §§ 5001-5012.

1.3.1 Cook Inlet

Upper Cook Inlet – Central and Northern Districts

The historical net fishing area in the Cook Inlet EEZ includes waters within the State Central Cook Inlet District. The demarcation of the EEZ waters in the net fishing area is three miles seaward from 59°46'15" N. lat., running east to the opposite shore from Anchor Point, north of Homer, Alaska. The State statistical areas that contain Federal waters where commercial salmon fishing is allowed are: 245-80, 245-90, 244-60, and 244-70. **Figure 4.**

Lower Cook Inlet – Kamishak Bay, Southern, Barren Island, and Outer Districts

State regulations prohibit commercial salmon fishing in Federal waters in the Lower Cook Inlet.

1.3.2 Prince William Sound area

Copper River and Bering River Districts

The Prince William Sound historical net fishing area includes waters in the State Copper and Bering River Districts. The demarcation of the EEZ waters in the net fishing area is a line three miles seaward from Cape Suckling to the southernmost tip of Pinnacle Rock, to the tip of Hook Point on Hinchinbrook Island. The State statistical areas that contain Federal waters where commercial salmon fishing is allowed are: 212-15, 212-25, and 212-35. **Figure 5.**

1.3.3 Alaska Peninsula area

False Pass, Area M – Unimak and Southwestern Districts

The historical net fishing area in EEZ waters in the south Alaska Peninsula, the False Pass area, includes waters in the State Unimak and Southwestern Districts. The demarcation of the EEZ waters in the net fishing area is three miles seaward from a line between Cape Lutke, 54°26'45" N. lat., and the west side of Sanak Island, 162°53' W. long. The State statistical areas that contain Federal waters where commercial salmon fishing is allowed are: 285-40, 285-30, 285-20, 284-90, 284-75, and 284-70.

Figure 6.

1.4 State salmon management

On July 31, 2010, the Council requested that the State provide its staff with information on the State's salmon management program, specifically how the State's program could provide an "alternative approach" for satisfying the requirements of the MSA's NS1.²⁰ The State provided its response on August 31, 2010. **Attachment.**

The State has many decades of sustainable salmon management, utilizing escapement goals and inseason management decisions by local managers. Alaska salmon fisheries are conservatively managed by allowing fishing with specific gears, in specific areas, at specific times. Alaska salmon fisheries generally occur in areas terminal or near-terminal to natal spawning systems, where the fish are highly

²⁰ 50 C.F.R. § 600.310(h)(3). See *infra* Section 3.1, State Salmon Management as an Alternative Approach.

concentrated. Generally, run times are consistent and predictable from one year to the next; salmon run sizes, however, are highly variable.

Under State management, salmon fishery openings are set pre-season through regulations adopted by the Board or inseason through management authority that has been delegated to ADF&G. Salmon seasons are managed and adjusted inseason through emergency orders in response to escapement goal level and run size. State escapement enumeration programs are in place with direct or indicator stock escapement monitoring for most Chinook, sockeye, coho, and pink salmon, and for chum in the Arctic-Yukon-Kuskokwim region. Fishing is allowed to continue only if inseason assessment of run strength indicates a harvestable surplus; the level of fishing depends on the strength of the inseason run. Local area managers, under authority delegated by the Commissioner of ADF&G, open and close the fisheries in response to inseason assessments of the strength and timing of runs. Weak salmon runs do occur and are unavoidable. Inseason, emergency order management strives to avoid the main principle of overfishing threat: intense fishing activity during weak runs.

1.4.1 The Sustainable Salmon Fisheries Policy and Board of Fisheries

ADF&G manages salmon fisheries under management plans adopted by the Alaska Board of Fisheries (Board), which has the authority to allocate salmon available for harvest among user groups. Regulations for Alaska salmon are made by the Board, consistent with State laws, and with Federal laws and the PST where they apply. ADF&G reviews salmon escapement goals and stock status for each salmon management area on a three-year cycle, consistent with the Board's regulatory review cycle. Escapement goal and stock status reviews are prepared prior to Board review. The Board's sustainable salmon fisheries policy is an integral part of its tri-yearly review of State salmon fisheries.²¹ The policy contains five fundamental principles for sustainable salmon management, each with criteria used to evaluate salmon fisheries and to address conservation issues. The five fundamental principles of the policy are:

1. Wild salmon populations and their habitats must be protected to maintain resource productivity;
2. Fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning;
3. Effective salmon management systems should be established and applied to regulate human activities that affect salmon;
4. Public support and involvement for sustained use and protection of salmon resources must be maintained; and
5. In the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats must be managed conservatively.

The Sustainable Salmon Fisheries Policy requires that ADF&G describe the extent to which salmon fisheries and habitats conform to the policy's explicit principles and criteria. In response, the Board must review fishery management plans or draft new plans. If a concern with a particular salmon stock is identified in the course of this review, an action plan with measures that include needed research, habitat improvements, or new regulations, must be developed to address the concern. The Sustainable Salmon

²¹ 5 AAC 39.222.

Fisheries Policy is implemented by the Board and ADF&G in the course of the Board’s normal regulatory cycle.

1.5 Amendments to the Salmon FMP

The original Salmon FMP (1979) established Federal and Council authority over salmon fisheries in the EEZ, but excluded that portion west of 175° E. long. **Figure 1.** Amendment 3 to the FMP (1990) extended jurisdiction of the FMP to the entire West Area EEZ. **Figure 7.** Each amendment to the Salmon FMP is detailed below:

Table 1. Amendments to the Salmon FMP.

Amendment	Date	Title	Pertinent Function(s)	Final Rule
Original FMP, and Amendments 1 and 2	1979 - 1981	<i>FMP for the High Seas Salmon Fisheries off the Coast of Alaska East of 175 Degrees East Longitude</i>	<ul style="list-style-type: none"> Establishes Council and NMFS authority over the salmon fisheries in Federal waters from 3 to 200 miles seaward. Excluded waters west of 175°E. long. from FMP. 	See Figure 1.
3	1990	<i>FMP for the Salmon Fisheries in the EEZ off the Coast of Alaska</i>	<ul style="list-style-type: none"> Extends jurisdiction of FMP to EEZ west of 175°E. long. Defers regulation of sport and commercial fisheries to state. Effectively removes Council and NMFS from routine management but expressly maintained Federal participation, oversight, and final authority. 	55 FR 47773
4		<i>Fourth Amendment of the Salmon FMP with the EA and Federal Assessment</i>	<ul style="list-style-type: none"> Provides a definition of overfishing (OFL), as required by NOAA regulations at 50 CFR 602. 	---
5 (superseded by 7)	1998	<i>Amendment Five to the Salmon FMP</i>	<ul style="list-style-type: none"> Implements EFH provisions contained in the MSA and 50 CFR 600.815. Describes and identifies EFH fish habitat for anadromous fish. Describes and identifies fishing and non-fishing threats to salmon EFH, research needs, habitat areas of particular concern, and EFH conservation and enhancement recommendations. 	65 FR 20216
6	2002	<i>Amendment Six to the Salmon FMP to Revise Definitions of Overfishing, MSY, and OY</i>	<ul style="list-style-type: none"> Updates the FMP with new definitions of overfishing in compliance with the MSA, consistent with the NS guidelines and State and Federal cooperative management, and based on the State’s salmon management and the PST. Implements an MSY control rule, fishing mortality rate (F), MFMT, MSST for Chinook and coho in SEAK troll fishery 	67 FR 1163
7 and 8	2006	<i>Amendments Seven and Eight to the Salmon FMP</i>	<ul style="list-style-type: none"> Amendment 7 supersedes Amendment 5 Updates descriptions of EFH and Habitat Areas of Particular Concern (HAPC) within the FMP²² Makes conservation and enhancement recommendations for EFH and HAPCs Identifies and authorizes protection measures for EFH and HAPCs 	71 FR 36694
9	2008	<i>Amendment Nine to the Salmon FMP</i>	<ul style="list-style-type: none"> Revises the boundaries of the Aleutian Islands Habitat Conservation Area (AIHCA) described in 	73 FR 9035

²² MSA sec. 303(a)(7) requires an FMP describe and identify EFH, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other measures to promote the conservation and enhancement of EFH. See *infra* **Table 2.**

			the FMP	
10	Under Secretarial Review	N/A	<ul style="list-style-type: none"> • "Permit Fees" • Combined Council FMP Amendments 101/92/36/14/10 	N/A

2 Options for the Scope of the Salmon FMP

The scope of the Salmon FMP directs how the requirements of the MSA and NS guidelines could be addressed; necessary updates to the FMP to meet these requirements, such as ACL/AMs, would be based on the FMP's scope. The following are brief descriptions of possible options for the Council's consideration for the future scope of its Salmon FMP that have been identified at this stage of the process: 1) maintain the existing geographic scope; 2) repeal the FMP in the EEZ off Alaska; 3) maintain the FMP in the East Area EEZ only; or 4) modify the FMP to specifically exclude the three historic commercial salmon net fishing areas in West Area EEZ. These possible options are generally discussed regarding how the option would function, and the identification and highlight of certain important aspects of each option.

2.1 Maintain the existing geographic scope of the FMP

Under this option, the Council would maintain the current "status quo" scope of the FMP as described in Section 1.1, Scope of the Salmon FMP, and the Council would analyze options to update the FMP as needed to meet MSA requirements and NS guidelines.²³ The State's escapement goal-based salmon management program is managing salmon conservatively, as evidenced by relatively healthy salmon runs, which could in turn be support for continuing deferred management for sport fisheries and the SEAK troll fishery. Clarification, however, of management authority and objectives for commercial fisheries in the West Area would be necessary.

2.2 Repeal the FMP entirely

Under this option, the Council would withdraw the FMP in its entirety and would no longer assert management authority over Alaska salmon fisheries in the EEZ. The Council would need to consider whether continued Federal oversight is necessary for the conservation and management of the Alaska salmon fisheries. If not, the Council would need to provide the rationale that an FMP is no longer necessary for continued conservation and sustainable management of Alaska salmon. The Council has not been actively involved in salmon management for the last two decades, which could indicate that Federal oversight of salmon fisheries management in the EEZ is no longer needed. In evaluating this option, the Council also should consider that salmon harvested in the commercial salmon fisheries are taken predominantly within State waters. In addition, repeal could eliminate possible redundant management structures between the Federal and State salmon management programs.²⁴

This option is countered by other points, however, indicating that FMP coverage may still be necessary. Under the MSA, the State may not be able to regulate vessels not registered with the State that are fishing

²³ A "no action" option is different from this "status quo" option. Under a "no action" option, the Council would make no changes to the Salmon FMP—no updates for the requirements of the MSA or NS guidelines, no modifications to management approach, etc. As a result, the FMP would remain in its current state, which is not a viable option.

²⁴ See 50 C.F.R § 600.340, National Standard 7 (NS7), Costs and Benefits (directing for minimizing costs and avoid duplication). Further, NS7 supports the valid conclusion that not every fishery requires an FMP.

for salmon in the EEZ.²⁵ Further, the FMP serves important ESA and international treaty functions in the East Area.²⁶ If the Salmon FMP is repealed, the existing ESA Section 7 consultation for listed salmon stocks may no longer be applicable. International agreements, and the ability to provide comments on EFH, may also be factors in favor of keeping an FMP in place.

2.3 Maintain the FMP in the East Area EEZ only

Under this option, the scope of the FMP would be modified to maintain coverage in the East Area and remove the West Area EEZ from the FMP. Maintaining the FMP in the East Area would leave existing management structures in place, recognizing the application of the PST biological opinion and the associated incidental take permit. Removing the West area from the FMP would remove the FMP's prohibition on commercial salmon fishing in the West area. The Council could then consider whether to maintain the existing management approach and continue to defer management of the sport and SEAK troll fishery to the State. The Council would also need to update the FMP for the East Area to meet MSA requirements and NS guidelines, but Federal requirements would no longer apply to the West Area EEZ.

2.4 Modify the FMP to exclude the three historical fishing areas in the West Area

Under this option, the FMP would continue to extend management authority over salmon in the EEZ of the East Area and West Area, but the scope of the FMP would be modified to exclude from Federal management the three historical net areas identified in Section 1.3, The West Area. The Council would consider whether to continue to close commercial salmon fisheries in the West area EEZ and whether to continue to defer management of the SEAK troll fishery and sport fishery to the State. With this tailored approach, concerns with unregulated fishing vessels would be reduced because the opportunity for fishing without being detected and regulated would be limited. To remove these three areas from the FMP, the Council would need to provide a rationale for why federal conservation and management are not necessary in these three areas of EEZ waters, consistent with the MSA.

National Standard 3 provides guidelines on structuring appropriate management units for stocks and stock complexes. A fish stock, to the extent practicable, must be managed as a unit throughout its range, and interrelated stocks must be managed as a unit or in close coordination. Excluding the three net fisheries in the West Area from the scope of the FMP would allow the State to manage salmon stocks seamlessly throughout their range, rather than imposing dual management, as would happen if the FMP were retained in these areas. A management unit that is less than the range of the stock may be justified if: complementary management exists; or is planned for a separate geographic area or a distinct use of the stocks; or if the unmanaged portion of the resource is immaterial to proper management.

2.5 Issues with Repealing the Salmon FMP

In considering whether to repeal in part, in whole, or modify the scope of the FMP, the Council will need to determine whether continued Federal oversight is needed for salmon conservation and management. Without an FMP, there is a risk that vessels not registered with the State could harvest salmon in the EEZ without regulation. The assessment of risk is largely dependent on the modification being considered: the Council, NMFS, and the State would have to understand the risk associated with removing the Salmon

²⁵ MSA 306(a)(3)(C).

²⁶ An ESA Section 7 consultation was conducted in 2008 on the US adoption of the PST fishing regime, and applies to the salmon fisheries in the East Area, including the Council's decision to defer management of this fishery to the State. The biological opinion also includes an ESA Section 10 incidental take permit for these fisheries. The PST regime, biological opinion, and incidental take permit are anticipated to be in place until 2018.

FMP in the entire EEZ, the entire West Area, or only those areas where the historical net fisheries occur. Removing the FMP could create an economically attractive opportunity for unregulated fishing activity, such as an unregistered domestic fishing vessel capable of avoiding any contacts with the State. The primary concern is with the possible entry into the EEZ of a catcher processor or other processing platform that could support several partner catcher vessels. If this occurred, the primary recourse would likely be for NMFS to close salmon fishing in the EEZ through emergency rulemaking. It is important for the Council to consider and weigh these risks under the options for repeal.

2.6 Amending the MSA

If the FMP is repealed, the State's inability to act against unregistered vessels in the EEZ could be addressed by a change to the MSA. MSA § 306(a)(3)(C) allows the State of Alaska to regulate a fishing vessel that is not registered with the State and that is operating in a fishery in the EEZ off Alaska, if no FMP was in place on August 1, 1996 for the fishery in which the vessel is operating. In addition, the Secretary and the Council must find that Alaska has a legitimate interest in the conservation and management of the fishery.²⁷ The Salmon FMP was in place on August 1, 1996. Modification to §306(a)(3)(C) removing the phrase "on August 1, 1996" could provide the State with the authority to regulate non-state registered vessels commercially fishing for salmon in the EEZ, which would, in turn, reduce the concern regarding unregulated fishing if the FMP were withdrawn in whole or in part. While it is clear that the intent of Congress is to provide Alaska with the authority to regulate non-state registered vessels in the absence of an FMP and Secretarial and Council recognition of the State's legitimate interest in the fishery, the relevance of the August 1, 1996 date to this authority is not clear.

3 Updating the Salmon FMP

Staff have begun to discuss options for updating the Salmon FMP with the requirements of the MSA and NS guidelines and are also pursuing a discussion of options to alleviate the necessity of setting ACL/AMs for Alaska salmon, cognizant that the Salmon FMP would still need to be updated for other MSA requirements.²⁸ The options currently identified are: State salmon management as an "alternative approach" to meet the NS1 requirements of the MSA; use of the international fishery agreement exemption for Chinook salmon in the SEAK troll fishery subject to the PST; and regulatory clarification that Alaska salmon fisheries will not be subject to the ACL/AM requirements of the MSA and the NS1 guidelines. For the other MSA 303(a) required provisions, options would need to be developed to address the areas where the FMP should be amended.

3.1 State salmon management as an "alternative approach"

Compliance with the MSA requires the Council to establish mechanisms for specifying ACL/AMs to prevent overfishing while achieving optimum yield (OY).²⁹ The NS1 guidelines contemplate limited circumstances where the standard approaches to specification of reference points and management measures detailed in the guidelines may not be appropriate. Pacific salmon is cited in the guidelines

²⁷ This management issue is not limited to Alaska salmon—the MSA § 306(a)(3)(C) "August 1, 1996" date poses problems for any species that was part of an FMP on August 1, 1996 but has subsequently been removed.

²⁸ See MSA § 303(a).

²⁹ MSA § 303(a)(15) ("[E]stablish a mechanism for specifying [ACLs] in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability").

specifically as an example of stocks that may require an “alternative approach.”³⁰ Under this flexibility within the guidelines, the Council may propose an alternative approach for satisfying the requirements of NS1 other than those set forth in the guidelines. The guidelines require that the Council document its rationale for proposing an alternative approach in an FMP amendment and document its consistency with the MSA. To that end, Council staff requested ADF&G provide input on how State salmon management could be an alternative approach for meeting the MSA requirements.

In a July 31, 2010 letter, Council staff requested that ADF&G provide it with assistance in evaluating the State’s salmon management program by describing in detail how the State’s escapement goal- and abundance-based salmon management program could serve as an “alternative approach” and satisfy the requirements of the MSA. ADF&G provided a summary of the State’s salmon management program in response to the Council’s request, which is summarized below (August 31, 2010).³¹ **Attachment.** The State’s response describes how its salmon management program represents an alternative approach to prevent overfishing while achieving OY. If the Council and NMFS determine that the State’s management represents an alternative approach that satisfies the requirements of the MSA, then implementing ACLs through the Salmon FMP in the manner described within the NS1 guidelines would not be necessary.

3.1.1 The State’s evaluation

NMFS has promulgated implementing guidelines to facilitate compliance with NS1 objectives for fisheries managed under an FMP. The guidelines expressly consider possible alternative approaches for Pacific salmon. The alternative approach to meet the requirements of the MSA may be invoked for the management of Pacific salmon off Alaska, where the spawning potential for a stock is spread over a multi-year period. The State’s salmon management program is based on scientifically defensible escapement goals and inseason management measures to avoid overfishing. The State asserts that developing a quota-based management system based on preseason forecasts in order to implement ACLs could result in greater risks of overfishing and levels of un-harvested stocks which may prevent the achievement of OY on a continuing basis. According to the State’s response, specifying a catch quota based on pre-season abundance forecasts is not as appropriate as salmon management based on monitoring inseason of abundance and escapement. With the exceptions of the SEAK troll fishery and Area M June net fisheries, catch quota-based fishery management has not been used in State salmon fishery management.³²

ADF&G expressly states that its salmon management system has been and is a successful and appropriate system for meeting the requirements of the MSA and NS guidelines to prevent overfishing while achieving on a continuing basis the OY from each salmon fishery for the fishing industry. Further, inseason abundance-based management has been adopted by the Pacific Salmon Commission to manage

³⁰ 50 C.F.R. §600.310(h)(3), Flexibility in application of NS1 guidelines (“There are limited circumstances that may not fit the standard approaches to specification of reference points and management measures set forth in these guidelines. These include ... stocks with unusual life history characteristics (*e.g., Pacific salmon, where the spawning potential for a stock is spread over a multi-year period*). In these circumstances, Councils may propose alternative approaches for satisfying the NS1 requirements of the [MSA] other than those set forth in these guidelines. Councils must document their rationale for any alternative approaches for these limited circumstances in an FMP or FMP amendment, which will be reviewed for consistency with the [MSA]”) (emphasis added).

³¹ Also referenced in the State’s response are the State’s policies for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) and for Statewide Salmon Escapement Goals (5 AAC 39.223).

³² Catch quotas for Area M were discontinued in June, 2003; Treaty Chinook salmon are allocated through the PST.

and conserve shared salmon resources. ADF&G gives the following reasons in support of the more appropriate utilization of an alternative approach for the management of Alaska salmon fisheries:

1. Salmon are semelparous, reproducing once during their life cycle;³³
2. The harvestable surplus of salmon consists of new recruits and the catch is comprised of mature salmon;
3. The productivity of each year class cannot be improved by limiting the catch amount in subsequent years;
4. Foregone catch cannot be recaptured in subsequent years; and
5. Salmon abundance cannot be estimated effectively in advance.

Thus, the State concludes that its program of inseason abundance estimates using contemporaneous data, with appropriate monitoring for achievement of escapement goals, is the most effective way to lessen the risk of overfishing while achieving OY on a continuing basis.

3.2 The International Agreement exception and Chinook salmon

In recognition that applying ACL/AMs requirements to stocks covered by an international fishery agreement may unfairly impact the US component of these fisheries, the MSA provides an exception for those stocks.³⁴ The NS1 guidelines generally require that FMPs establish ACL/AMs for all stocks and stock complexes in the fishery, but recognize the statutory exception from the requirement for stocks or stock complexes that are managed under an international fisheries agreement in which the US participates. Under MSA § 3(24), an international fishery agreement is “any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the [US] is a party.”

The Pacific Salmon Treaty (PST, 1985) clearly meets the criteria related to international fishery agreements. The PST is a bilateral treaty between the US and Canada established an international management regime to address the conservation and harvest of salmon originating in one country that contribute to fisheries in the other. Terms and provisions of the PST are negotiated through the Pacific Salmon Commission (Commission).

Chinook salmon harvested in SEAK predominately originate from streams in the Pacific Salmon Treaty area, which stretches from central Oregon, northwest through Canada, to Cape Suckling. All Chinook harvested in the SEAK, other than certain production from Alaska hatchery facilities, are subject to catch limit provisions of the PST. An annual abundance-based harvest limit for Chinook in the SEAK is established through Commissions and the PST process. The permitted salmon harvest is allocated to fisheries and stakeholders in accordance with regulations adopted by the Alaska Board of Fisheries (Board).³⁵

³³ A species is considered semelparous if it reproduces a single time in its lifetime; iteroparous if it has many reproductive cycles over the course of its lifetime.

³⁴ MSA § 303(note); 50 C.F.R. § 600.310(h)(2)(ii).

³⁵ The Chinook winter troll fishery is managed so as not to exceed 45,000 fish under the PST. Any Treaty Chinook not harvested in the winter fishery are available for the spring and summer fisheries. *See* ADF&G Report to the NPFMC, June 2010. *See also* 5 AAC 29.080, the Board’s winter troll management plan.

3.3 Regulatory clarification of NS1 guidelines as pertaining to Alaska salmon fisheries

Staff have discussed whether a regulatory clarification of NS guidelines would be possible. Language in the reauthorized MSA requiring ACL/AMs was developed largely on the practices used in North Pacific groundfish fisheries for over three decades. While MSA § 303(a)(15) states that FMPs must establish mechanisms for specifying ACL/AMs in the FMP, implementing regulations, or annual specification at a level such that overfishing does not occur in the fishery, MSA § 302(h)(6) requires the Council to “develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its SSC or the [established] peer review process.” While the Council’s salmon FMP manages very limited aspects of the salmon fisheries, neither the Council nor NMFS actively manage salmon under the FMP and have questioned whether ACLs (or status determination criteria or OFLs, for that matter) must be developed for fisheries, like Alaska salmon, that are not actively managed under the FMP.

A straightforward solution to the ACL/AM (and potentially other NS1) requirements could be to request NOAA to issue clarifying guidelines through rulemaking and regulation which would: 1) specifically pertain to Alaska salmon fisheries; 2) fully recognize that the Council and NMFS do not actively manage salmon under the current FMP; and 3) acknowledge that the State's management program for these fisheries fully satisfies the intent of NS1. Such a revision would require a determination by NOAA that the current State salmon management program meets applicable MSA and NS1 requirements. Though a similar determination would be required to use the “alternative approach” clause of the existing guidelines (as is the suggested approach throughout this discussion), a direct regulatory determination, if adopted, could provide a clearer basis for establishing that the current State salmon management program meets National Standards. This regulatory approach would require a specific, direct request from the Council to NMFS leadership and presumes that the Council does not desire a greater role in salmon fisheries management (i.e., setting of ACL/AMs). While this approach could eliminate any need for the Council to amend the FMP relative to the ACL/AMs requirement, the Council would still need to amend the FMP to fulfill other federal requirements.

3.4 Specific FMP requirements

As discussed above, implementation of ACL/AMs and other MSA requirements hinge on the future scope and nature of the FMP. Specific measures for the Council to consider in updating the Salmon FMP would be developed once the Council provides direction on: 1) its preferred scope of the FMP; 2) whether to maintain the deferred management of the SEAK troll and sport fisheries; 3) whether to maintain the closure of the EEZ in the West Area; and 4) the FMP’s role in the three historical net areas in the West Area EEZ. Various requirements of the MSA and associated NS guidelines are addressed within the text of this discussion paper, in the footnotes to the text, and are generally summarized below in **Table 2**.

Table 2 is a list of items that MSA § 303(a) requires for an FMP, though it is not exhaustive; it is an effort to summarize in a very general way, in order to inform the Council of the breadth of issues that will need to be addressed in updating the FMP.³⁶ In general, an FMP must: include a description of the fishery and its potential yield; include a description of the economic consequences of the fishery’s conservation and management; adhere to data collection requirements; include conservation and management measures to

³⁶ Please note that **Table 2** is not legal guidance, is not intended as legal opinion, does not carry the weight of regulatory text, and is not specific to the management of Alaska salmon fisheries.

ensure sustainable harvest and prevent overfishing, and include the associated reference points; assess and minimize bycatch; protect the safety of human life at sea; and must fairly and equitably allocate the fishery resources among participants. The NS guidelines at 50 C.F.R. §§ 600 Subpart D provide guidance on how the MSA provisions should be addressed and implemented within an FMP, and should be closely considered when developing options for meeting the MSA requirements or determining which requirements are satisfied in the current FMP.³⁷

Table 2. Required contents and provisions of an FMP, generally.³⁸

MSA § 303(a)	FMP Requirement	MSA Specification(s)	Elements	Applicable to: ³⁹
(1)	Conservation and management measures	Shall contain:	<ul style="list-style-type: none"> • Necessary and appropriate measures; • Any discretionary measures (described in §(b)); • Consistent with NS, MSA, any international recs., and any other applicable law(s); • To prevent overfishing, rebuild, and to restore fishery long-term health and stability; • While achieving on continuing basis Optimum Yield (OY). 	US and foreign fishing vessels
(2)	Description of the fishery(ies) – and the potential yield	Shall contain a description of, but not limited to, and utilizing the best scientific information available at the time of preparation, the:	<ul style="list-style-type: none"> • Number of vessels involved; • Type and quantity of fishing gear used • Species involved and location(s); • Likely management cost; • Actual and potential revenues; • Any recreational interests; and • Nature and extent of foreign fishing and Indian Treaty fishing rights, if any. 	Fishery(ies) covered under the FMP
(3)	Present and probable future condition of the fishery – MSY and OY	Assess and specify, and include a summary of the information used, the:	<ul style="list-style-type: none"> • Maximum Sustainable Yield (MSY); and • Optimum Yield (OY). 	Fishery(ies) covered under the FMP
(4)	Capacity and extent of Optimum Yield (OY)	Assess and specify, fairly and equitably and on an annual basis, the:	<ul style="list-style-type: none"> • OY harvest by US vessels; • Un-harvested OY available to foreign vessels; and • US processors that will process the US OY harvest. • Allocation of fishing privileges must be fair and equitable, reasonably calculated to promote conservation, 	US and foreign fishing vessels

³⁷ Please note that the current FMP reflects some new MSA requirements, such as OFLs for the East Area EEZ and Essential Fish Habitat (EFH) descriptions for Alaska salmon species.

³⁸ Please note that **Table 2** is intended for illustrative purposes only. It does not capture the nuances and details of subsequent implementation of the MSA FMP requirements.

³⁹ 50 C.F.R. § 600.325(b) (“An FMP may not discriminate among US citizens, nationals, resident aliens, or corporations on the basis of their state of residency. An FMP may not incorporate or rely on a state statute that discriminates against residents of another state”).

			and must avoid excessive shares.	
(5)	Pertinent data submitted to the Secretary of Commerce (Secretary)	Specify the pertinent data for commercial, recreational, charter, and processors for:	<ul style="list-style-type: none"> Type, quantity of gear used; Catch by species #s or weight; Fishing areas, time of fishing, and # of hauls, and necessary economic information; and the Estimated and actual processing capacity of US processors. 	Submitted to the Secretary
(6)	Temporary adjustments	Consider and provide, after consultation with USCS and fishery users, for:	<ul style="list-style-type: none"> Access to the fishery because of weather or other conditions affecting safe conduct; also Adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants. 	US vessels otherwise prevented from harvesting
(7)	Essential Fish Habitat (EFH)	Describe and identify, based on the [NS] guidelines, and minimize to the extent practicable the:	<ul style="list-style-type: none"> Adverse effects by fishing; and Other actions to encourage conservation and enhancement of EFH. 	Fish species or complexes covered under the FMP
(8)	Scientific data	Assess and specify the nature and extent of:	Data needed for effective implementation of the FMP, for an FMP submitted after 1/1/91 under 50 USC. § 1854(a) or prepared by the Secretary.	Fishery(ies) covered under the (qualifying) FMP
(9)	Fishery Impact Statement (FIS)	Assess, specify, and analyze the likely effects, if any, of:	<ul style="list-style-type: none"> The cumulative conservation, economic, and social impacts, of the conservation and management measures on; and Possible mitigation measures for; Also, participants' safety of human life at sea. 	Fishery(ies)' participants; fishing communities; and adjacent fisheries;
(10)	Condition of the fishery(ies) – determining whether stocks are overfished or whether overfishing is occurring	Specify and identify, using objective basis and measurable criteria:	<ul style="list-style-type: none"> Analysis of how criteria determined and stocks relationship to reproductive potential; or where The Secretary determined a stock is approaching overfished/ is overfished; Contain conservation and management measures to prevent/ end overfishing and rebuild. 	FMP-covered, overfished fishery(ies); and Permitted Council or Secretary FMPs covering US EEZ, salmon, or high seas vessels, or US first processors
(11)	Bycatch	Establish, assess, and include:	<ul style="list-style-type: none"> Standardized reporting methodology; Amount and type of bycatch occurring in the fishery(ies); Conservation and management (and monitoring) measures – to the extent practicable in the following priority: avoid where practicable, minimize bycatch, and minimize mortality of unavoidable bycatch. 	Fishery(ies) covered under the FMP
(12)	Fishing Mortality	Assess type and amount of fish:	<ul style="list-style-type: none"> Caught and released alive during recreational fishing; and Mortality, including conservation and 	Recreational fishing, under catch and

			management measures that, to the extent practicable; <ul style="list-style-type: none"> • Minimize mortality; and • Ensure extended survival. 	release management programs
(13)	Participating sectors within the fishery(ies)	Include a description of the sectors':	<ul style="list-style-type: none"> • Economic impact; and • Quantify trends in landings of managed fishery resource, to the extent practicable. 	Commercial, recreational, and charters
(14)	Rebuilding plans or other conservation and management measures, if necessary	Reduce the overall harvest, if necessary, and suitably allocate and take into consideration:	<ul style="list-style-type: none"> • The economic impact of harvest restrictions or recovery benefits; • Allocated reductions fairly and equitably among commercial recreational, and charter fishing sectors 	Participants in effected fishery(ies)
(15)	Preventing overfishing	Establish mechanism for specification of; And the exceptions	<ul style="list-style-type: none"> • Annual Catch Limits (ACL); • Accountability Measures (AM); and • Implementing regulations or annual specifications • Statutory Exceptions 	In the FMP, including a multiyear plan

4 Conclusions and Next Steps

With this background, suite of possible options, and additional considerations, the Council may wish to give further direction on whether and how to move forward with review and analysis of the current Salmon FMP. The following next steps are proposed for Council consideration:

1. Preparation of an analysis to inform the Council's evaluation of the Salmon FMP and its determination of the FMP's purpose and scope, and any necessary updates to the FMP.
2. Updating the FMP will necessitate further discussion, exchanges of information, and continued coordination with ADF&G and NMFS staff, as the Council considers possible options and additional considerations to update the FMP, as well as coordination with the Board of Fisheries.
3. The Council's preferred future scope and role of its Salmon FMP will affect the FMP updates and options for complying with ACL/AMs and other specific MSA and NS1 requirements.
4. Staff could develop a strategy for a thorough review of the Salmon FMP by generating:
 - i. An amalgamation of the 1990 FMP and all subsequent amendments;
 - ii. A complete matrix of the MSA 303(a), NS1 requirements, and the existing FMP provisions;
 - iii. A discussion on how and to what degree the Federal requirements are addressed in the current FMP and amendments; and
 - iv. Possible options for addressing specific MSA requirements.

A Council Meeting schedule outlining possible steps for further analysis of the FMP, including Alaska Board of Fisheries meetings for convenience, is provided below:

Table 3. Possible schedule for analysis of the Salmon FMP.

2010-2011	Council Meeting	Staff Product	Possible Staff Tasking	Dates of Alaska Board of Fisheries meetings
October	Joint Protocol Committee Meeting, 10/5, Anchorage	Council staff presentation and briefing paper	N/A – Briefing paper posted on Council website ^a	<i>Work Session, 10/13, Kenai</i>
December^b	12/6, Anchorage	Council staff presentation and discussion paper	Refine focus of discussion paper	<i>Lower Cook Inlet Finfish, 11/15, Homer</i>
January / February	1/31, Seattle, WA	Refined discussion paper	Options to carry forward for analysis as Alternatives	<ul style="list-style-type: none"> • <i>Kodiak Finfish, 1/11, Kodiak</i> • <i>Chignik Finfish, 1/16, Anchorage</i> • <i>Upper Cook Inlet Finfish, 2/20, Anchorage</i>
March / April	3/28, Anchorage	Preliminary review of Alternatives	Refine Alternatives for full analysis	<i>King and Tanner and supplemental issues, 3/22, Anchorage</i>
June – August	6/6, Nome	N/A	Continue analysis for Initial Review	<i>None</i>
September / October	9/26, Unalaska	Initial Review	TBD	<ul style="list-style-type: none"> • <i>Work session, 10/11, Anchorage</i> • <i>Pacific cod, GOA-wide, 10/13, Anchorage</i>
December	12/5, Anchorage	Final Action	TBD	<i>PWS and Upper Copper/Upper Susitna Finfish, 12/1, Anchorage</i>

^a <http://www.fakr.noaa.gov/npfmc/fmp/salmon/SalmonFMPupdate1010.pdf>.

^b The Council is currently at this stage in the possible discussion process.

5 Participating Agencies

North Pacific Fishery Management Council Staff
Chris Oliver, David Witherell, Sarah Melton

Alaska Department of Fish & Game
Stefanie Moreland, Gordy Williams, Doug Eggers

State of Alaska, Department of Law
Lance Nelson, Mike Mitchell, Anne Nelson

National Marine Fisheries Service, Alaska Region, Sustainable Fisheries Division
Sue Salvesson, Gretchen Harrington

NOAA Office of General Counsel, Alaska Region
Lauren Smoker, Clayton Jernigan, Maura Sullivan

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7 Figures

Figure 1. The original geographic scope of the Salmon FMP, showing the East and West management areas and the shaded area of the EEZ west of 175°E. long., later included in the FMP under Amendment 3.

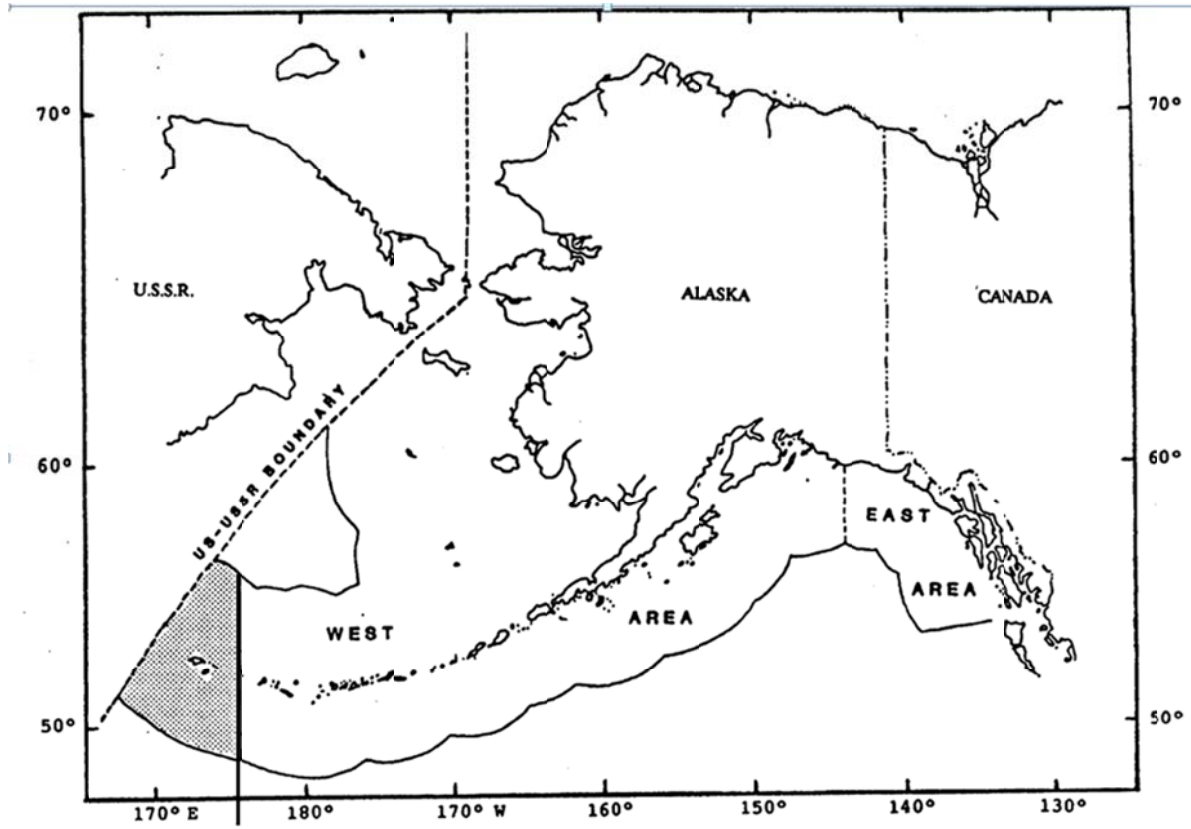


Figure 2. Combined three mile state and statistical area lines, Southeast area.

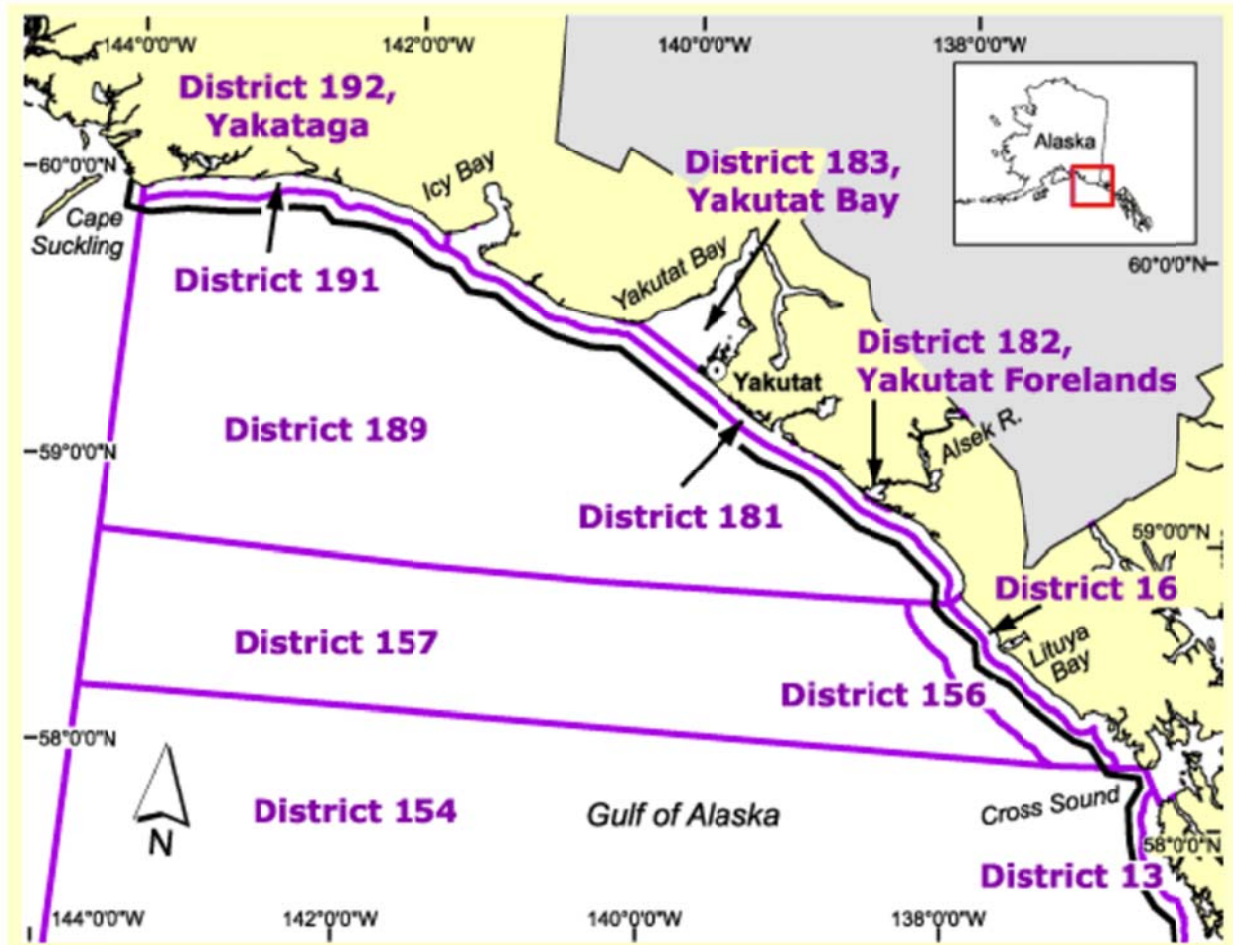


Figure 4. Combined three mile state and statistical area lines, Cook Inlet Area.

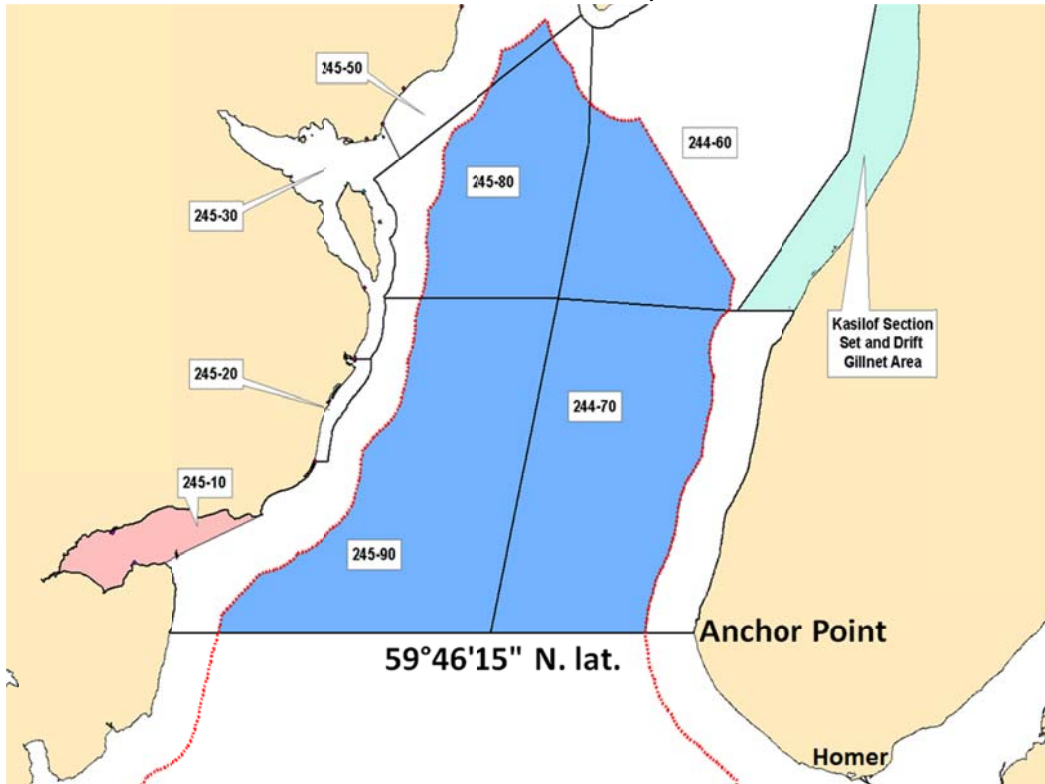


Figure 5. Combined three mile state and statistical area lines, Copper River area.

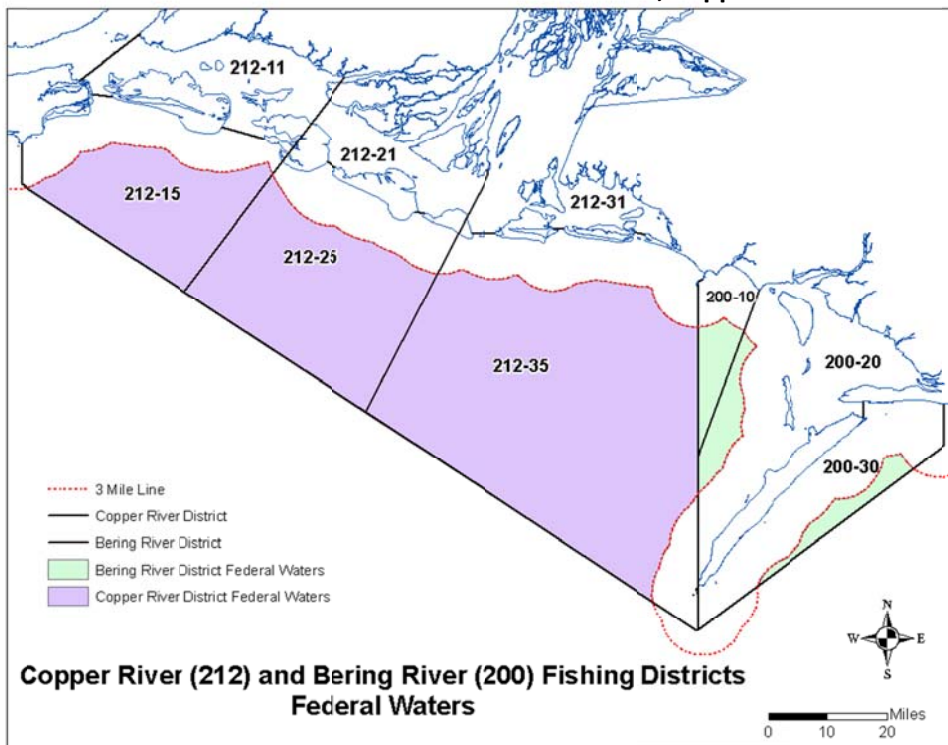


Figure 6. Combined three mile state and statistical area lines, False Pass area.

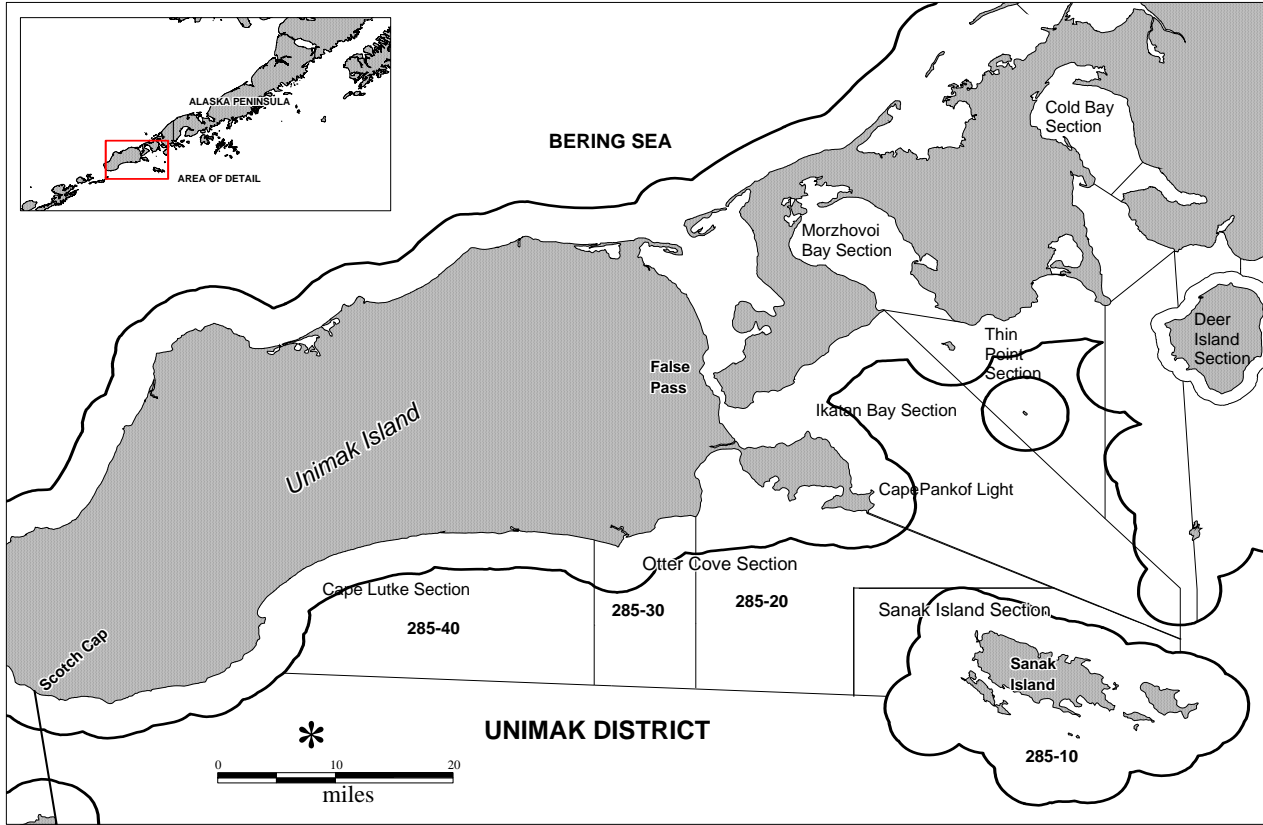
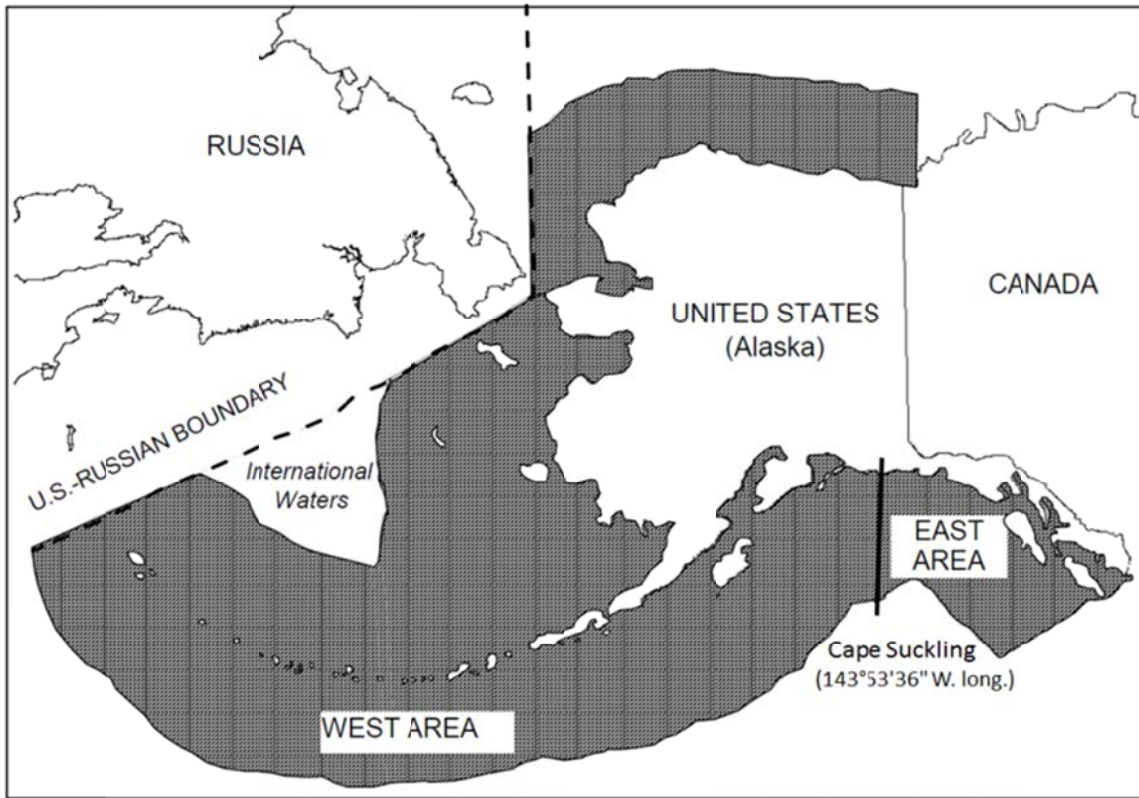


Figure 7. East and West Areas of the North Pacific EEZ, divided at the west longitude of Cape Suckling.



8 Attachment

ADF&G, 2010. State of Alaska's Salmon Fisheries Management Program. Response to Council request (June 30, 2010), August 31, 2010. Correspondence. Juneau, Alaska.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME OFFICE OF THE COMMISSIONER

SEAN PARNELL, GOVERNOR

P.O. BOX 115526
JUNEAU, AK 99811-5526
PHONE: (907) 465-4100
FAX: (907) 465-2332

August 31, 2010

Mr. Chris Oliver
Executive Director
North Pacific Fishery Management Council
605 W. 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Dear Mr. Oliver:

The enclosed discussion of the State of Alaska's (state) salmon management program is in response to your request for assistance in evaluating the program for North Pacific Fishery Management Council (Council) compliance with the requirements of National Standard 1 (NS1) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to prevent overfishing while achieving optimum yield. Attachments referenced in our discussion are provided for use in the Council and agency review of the state system. These include the *Policy for the Management of Sustainable Salmon Fisheries* (5AAC 39.222) and the *Policy for Statewide Salmon Escapement Goals*.

The National Marine Fisheries Service (NMFS) promulgated implementing guidelines, by regulation (50 CFR § 600.310, January 16, 2009), to facilitate compliance with NS1 requirements under MSA. These guidelines outline a prescriptive approach to achieve NS1 objectives for fisheries that are managed by federal fishery management plans (FMPs), but also expressly contemplate an alternative approach for stocks with unusual life history characteristics like Pacific salmon. 50 C.F.R. § 600.310(h)(3). The Council's salmon FMP delegates salmon fisheries management to the State of Alaska, and the state believes the MSA provision for an alternative approach to meeting NS1 guidelines is intended to be used in circumstances such as management of Pacific salmon off Alaska.

Management of Alaska salmon fisheries calls for an alternative approach to that taken for other stocks under a federal fishery management plan for the following reasons:

- 1) unlike groundfish stocks, salmon are semelparous, reproducing once in the life cycle;
- 2) the harvestable surplus is entirely new recruits and the catch comprises almost exclusively mature salmon;
- 3) the productivity of a specific year class cannot be improved by limiting harvest in subsequent years;
- 4) foregone harvest cannot be recaptured in future years; and

- 5) since abundance cannot be estimated effectively in advance, in-season estimations of abundance using contemporaneous data, with appropriate management actions taken to assure escapement and optimum production in future years, is the most effective way to avoid the risk of overfishing.

Alaska's salmon fisheries management has a long and successful history of avoiding overfishing. Scientifically defensible salmon escapement goals and robust processes for in season management are central tenets of sustainable salmon management in Alaska. Contrary to the intent of the MSA, developing a quota system based on preseason forecasts in order to implement annual catch limits (ACLs) would result in greater risks of overfishing and failure to achieve optimum yield.

In recognition that applying ACL and accountability measure (AM) requirements to stocks covered by an international fishery agreement may unfairly impact the U.S. component of fisheries, the MSA and NS guidelines provide for an exception for those stocks. 16 U.S.C. § 1853(note); 50 C.F.R. § 600.310(h)(2)(ii). Management provisions of the international Pacific Salmon Treaty between the U.S. and Canada apply to Chinook salmon stocks harvested in state and federal waters off Southeast Alaska, and these stocks should be excepted from ACL and AM requirements. Chinook harvested off Southeast Alaska predominately originate from streams in the Pacific Salmon Treaty area which stretches from central Oregon through Canada to Cape Suckling, Alaska.

We encourage further information exchanges on this issue as the Council considers potential alternatives to comply with federal requirements, and look forward to ongoing coordination among fisheries scientists, salmon research and management biologists to ensure the Council is able to make appropriate, fully informed decisions.

Sincerely,



Denby S. Lloyd
Commissioner

Enclosures

State of Alaska's Salmon Fisheries Management Program

Introduction

The Fishery Management Plan (FMP) for salmon fisheries in the Exclusive Economic Zone (EEZ) off Alaska's coast defers salmon management to the State of Alaska. Compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and National Standards (NS) guidelines requires the Regional Management Councils, with some exceptions, to establish a mechanism for specifying annual catch limits (ACLs) and accountability measures (AMs) to prevent overfishing of stocks that are covered under the FMP (MSA § 303(a)(15); 16 U.S.C. §1853(a)(15)). The North Pacific Fishery Management Council (Council) has requested the assistance of Alaska Department of Fish and Game (ADF&G) in evaluating the State of Alaska's salmon management program with regard to the requirements of the MSA. This document describes how the State of Alaska salmon management system is a successful and appropriate system for meeting MSA requirements to prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The Council generally applies catch quota based fishery management systems for managing groundfish fisheries in the EEZ off Alaska. Annual catch quotas, often allocated among different users, are specified for each stock. The quota is based on the assessment of the stock biomass and the application of a suitable exploitation rate. Stock Assessment and Fishery Evaluation (SAFE) documents, which detail stock assessment and final acceptable biological catch (ABC) recommendations, are prepared in the year prior to the fishing season using stock assessment data collected as recently as the year prior to the fishery. However, proposed ABC recommendations are made for one and two years prior to the fishery based on data gathered up to two or three years before the fishery is conducted. This minimum 2-year lag between data acquisition and the years for the proposed recommendations allows suitable time for the lengthy public and government review process required under Federal law. The final ABC recommendations are very often close to the proposed ABCs, which require 2-year population projections. This is generally appropriate because groundfish fisheries under Council jurisdiction primarily occur on long-lived stocks where new recruits are not a significant component of the stock biomass, and projection models tend to use consistent growth and natural mortality rates. Because projections are reasonably accurate and quotas are small compared to the stock biomass, there is little risk of overfishing imposed by erroneous projection of stock assessment information; an inherent risk in relying on early projections to establish catch quotas. Furthermore, groundfish stocks are iteroparous, so management can adapt over time with conservation action taken in a subsequent year to increase the productive biomass and increase the allowable catch to respond to overly conservative management thereby minimizing foregone harvest.

Alaska salmon fisheries pose a different case because

- 1) unlike ground fish stocks salmon are semelparous reproducing once in the life cycle;
- 2) the harvestable surplus is entirely new recruits and catch is almost exclusively comprised of mature salmon;
- 3) the productivity of a specific year class cannot be improved by limiting harvest in subsequent years;
- 4) foregone harvest cannot be recaptured in future years; and

- 5) since abundance cannot be estimated effectively in advance, in-season estimations of abundance using contemporary data with appropriate management actions taken to assure escapement and optimum production in future years is the most effective way to avoid the risk of overfishing.

Alaskan salmon fisheries are managed by allowing fishing in specific times and areas. With the exception of Chinook salmon in the Southeast Alaska troll fishery, Alaska salmon fisheries generally occur on maturing fish in areas terminal or near-terminal to natal spawning systems, where fish are concentrated and highly vulnerable. Although salmon are vulnerable to fishing for only a short time, run timing is consistent and predictable from year to year. Salmon are relatively short-lived and highly productive, with sustainable catch levels large relative to the spawning stock. Because salmon run sizes are highly variable and unpredictable, specifying a catch quota based on pre-season abundance forecasts is a much inferior approach to salmon management than actively managing for monitored in-season abundance.

During the federal management era prior to Alaska statehood, salmon fisheries were largely managed by fishing schedules and fishing areas defined in regulation pre-season. There were provisions for in-season adjustments, but these were ineffective and rarely implemented due to the need for secretarial review and lack of in-season assessment information. By the time in-season adjustments were implemented it was too late for effective conservation measures. The inability to curtail fishing during weak runs and extended periods of poor productivity led to the depletion of Alaskan salmon stocks at the time of Alaska statehood. With the exception of the Southeast Alaska troll fishery and the Area M June net fisheries, catch quota based fishery management systems have never been used in State management of Alaska salmon fisheries (catch quotas were abandoned for the Area M June fishery in about 2003). These two fisheries occur on distant stocks with catch quotas comprising a relatively small portion of the overall stock.

In the State fishery management era, the vast majority of salmon may be taken only in fishing periods established in-season by emergency order. Fishing is allowed to continue only if in-season assessment of run strength indicates harvestable surpluses. The level of fishing time allowed depends on the strength of the in-season run. Authority to open and close fisheries is delegated to local area managers by the Commissioner of Fish and Game. This enables timely and effective fishery management responses to in-season information. Under State management, stock assessments are focused on obtaining escapement estimates for stocks targeted in fisheries. At the time of statehood, escapement data were available only for Bristol Bay sockeye salmon, a few Kodiak sockeye systems, Chignik sockeye, and aerial surveys were utilized to assess pink salmon escapement in coastal areas throughout the Gulf of Alaska. Escapement enumeration programs have since been greatly expanded, with direct or appropriate indicator stock monitoring of escapements for most sockeye, Chinook, and pink salmon stocks targeted in Alaska salmon fisheries, as well as important chum salmon stocks in Arctic-Yukon-Kuskokwim (AYK) region. This management and stock assessment framework addresses the principal overfishing risk in managing salmon fisheries: allowing intense fishing during weak runs. Because occasional weak runs are inevitable, timely and accurate assessment of run strength avoids overfishing by implementing conservative fishing schedules conditioned on in-season abundance.

A fishery management system based on strict catch quotas and associated ACLs and AMs, implicit in the NS implementation, would be problematic for Alaska salmon fisheries. ACLs are inconsistent with the

State's salmon fisheries management system which has a long-term, successful history of avoiding overfishing. Their implementation would not be beneficial for meeting the goals and requirements of MSA to prevent overfishing.

National Standards Guidelines

National Standards 1 (NS1) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that conservation and management measures "shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."

Overfishing occurs whenever a stock or stock complex is subjected to a level of fishing mortality that jeopardizes the capacity of the stock or stock complex to produce maximum sustained yield (MSY) on a continuing basis. The MSA establishes MSY as the basis for fisheries management and requires that fishing mortality does not jeopardize the capacity of a fishery to produce MSY.

NS1 is implemented with the 2009 MSA Provisions; Annual Catch Limits; National Standards Guidelines; Final Rule, which specifies an OFL/ABC/ACL framework. A tier of reference points are defined: the overfishing limit (OFL) which corresponds with MSY; the acceptable biological catch (ABC) which cannot exceed the OFL; the annual catch limit (ACL); and the annual catch target (ACT). The difference between OFL and ABC depends on how scientific uncertainty is accounted for in the ABC control rule. The difference between ACL and ACT depends on management performance and uncertainty. For salmon, one can define reference points based on escapement, exploitation rate, or catch; however catch based reference points and associated targets generally cannot be safely determined pre-season, and assessment of compliance can only be assessed post-season.

For escapement based reference points in the OFL/ABC/ACL framework,

$$S_{OFL} < S_{ABC} = S_{MSY} \leq S_{ACL} < S_{ACT}$$

For exploitation rate- and catch- based reference points.

$$F_{OFL} > F_{ABC} = F_{MSY} \geq F_{ACL} > F_{ACT}$$

$$C_{OFL} > C_{ABC} = C_{MSY} \geq C_{ACL} > C_{ACT}$$

NS1 requires that each FMP specify objective and measurable criteria (status determination criteria - SDC) for identifying when stocks or stock complexes covered by the FMP are overfished. The guidelines for NS1 specify that status determination criteria must specify both a maximum fishing mortality threshold (MFMT) and a minimum stock size threshold (MSST). The fishing mortality threshold cannot exceed the MFMT or level associated with the MSY control rule. Exceeding MFMT for a period of 1 year constitutes overfishing. The MSST should be expressed in terms of spawning biomass or other measure of productive capacity, and should equal whichever of the following is the greater; one-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years. If the spawning stock size falls below the threshold for a year, the stock complex is considered overfished.

Due to their unique life history, implementation of the SDC as outlined in NS1 is problematic for salmon. Salmon are semelparous, short-lived (2-7 years), and generally vulnerable to exploitation only during

their spawning migration (except immature salmon are vulnerable to some extent as bycatch in groundfish fisheries and immature Chinook salmon are targeted in ocean troll salmon fisheries). Thus, depending on maturity schedules, only a small to moderate fraction of the stock is vulnerable to fishing in a given return year. The inter-annual abundance of salmon spawning populations is typically highly variable, due to variable year-class strength and variable maturation schedules, and fishing mortality rates are expressed as a fraction of the spawning stock. This is very different than fishing mortality rates on long-lived iteroparous populations, where all fully recruited age classes are considered vulnerable to fishing. Status determinations for salmon must account for multiple return years from a single brood.

There are also difficult problems with implementation of an exploitation rate or catch based OFL/ABC/ACL/ACT framework for salmon. Alaskan salmon fisheries are generally managed under a constant escapement harvest policy where exploitation rates and catch fluctuate with variation in salmon run strength, with escapement targets fixed in time. The MSY control rules for salmon fisheries are more safely implemented by targeting management actions to achieve a target escapement level rather than a target fishing mortality rate or a target catch level. It is possible to determine catch-based and exploitation rate-based management targets for salmon on a post season basis. Here $F_{MSY} = (1 - S_{MSY}/R)$ and $C_{MSY} = F_{MSY} R$. Because salmon runs are highly variable and impossible to accurately forecast, catch based management targets would be very risky and routinely result in over-harvest in the commonly encountered situation of an unanticipated weak run. Catch based MSY control rules are not appropriate for salmon fisheries. MSY exploitation rates on salmon are, on average, very high relative to those for iteroparous populations. With the highly variable and unpredictable nature of salmon spawning abundance, it is very difficult and risky to implement a fixed MSY exploitation rate harvest policy. ACLs and associated ACTs as described in NSI, clearly focus on a catch based management system. Because of high risk associated with catch-based management targets, which are based on inherently inaccurate pre-season forecasts of salmon runs, these approaches are inferior to escapement based management for avoiding overfishing of salmon stocks.

Salmon Stock Assessment and Management

For salmon, maximum sustained yield is achieved by fishing appropriately to maintain the spawning escapement at levels that provide potential to maximize surplus production. Salmon populations exhibit compensatory and density dependent stock recruitment dynamics, driven by intra-specific competition for limited spawning and rearing habitat. In salmon populations, sustained yield is driven by increased production in response to fishing induced reductions in spawning escapement and concomitant increased survival accompanying decreased competition. Sustained yield in iteroparous populations is driven by fishing induced increased growth in biomass over biomass lost to natural mortality (i.e., yield per recruit). This concept has no relevance for salmon since the vast majority of fish are harvested at the end of their life.

Biological reference points for salmon populations are estimated based on long-term, stock specific assessment of recruits from parent escapement or long-term assessment of escapement. Estimating biological reference points for salmon populations requires direct assessment of the spawning stock. Biological reference points for iteroparous populations can and usually are estimated without direct stock-recruit assessment data. The salmon stock assessment programs employed by ADF&G are designed to monitor stock and age-specific catch and escapements. The program employs comprehensive sampling of

catch and escapements by age; comprehensive escapement monitoring using tower counts, weir counts, sonar counts, mark-recapture experiments, aerial counts, and foot counts; and routine monitoring and stock identification of catch using a variety of methods including, genetic stock identification (GSI), coded wire tags, and otolith marks. These data enable the current season run (i.e., catch plus escapement) to be assigned to prior brood years (i.e., the return from stock specific parent escapement). Comprehensive implementation of the ADF&G salmon stock assessment programs, over time, provides stock-recruit data necessary for developing MSY based escapement goals. Since the catch and escapement monitoring programs are conducted in real-time, they provide in-season assessments of run strength necessary for managers to implement ADF&G's escapement based harvest polices. In fisheries, where escapement monitoring occurs distant from the fishery, test fisheries are employed to provide more real-time assessment.

The compensatory nature of salmon population dynamics is reflected in the Ricker stock recruit model (Figure 1). Appropriate biological reference points used as benchmarks in status determinations, and in setting escapement goals can be determined from the Ricker model parameters estimated by fitting the Ricker model to historical stock-recruit data (Ricker 1954). These include α , the productivity of the stock and the overfishing harvest rate ($U_{of} = 1 - 1/\alpha$); the equilibrium escapement (S_{eq}); MSY escapement (S_{msy}), (typically between .35 and .45 of the equilibrium escapement), and the MSY harvest rate (U_{msy}). Escapement goals are typically set at the range of escapements that provides 90% or more of MSY. The approach of using the fitted Ricker stock-recruit model to set escapement goals is routinely used by ADF&G for stocks where stock specific runs can be estimated and there is sufficient contrast in the historical escapement data to reflect density dependence.

Biological reference points estimated for many salmon stocks demonstrate that salmon populations are extremely productive, with the limit return per spawner (α) averaging 3.7, 4.0, 3.7, 6.0, and 6.9 for pink, chum, coho, sockeye, and Chinook salmon, respectively. MSY exploitation rates (i.e., the average harvest rates employed to maintain constant escapement in the escapement goal range) are high, averaging 0.53, 0.56, 0.63, 0.65, and 0.68 for pink, chum, coho, sockeye, and Chinook salmon, respectively. The overfishing exploitation rate (i.e., the fishing rate if continuously applied will deplete the stock) is also very high averaging 0.72, 0.74, 0.80, 0.81, and 0.83 for pink, chum, coho, sockeye, and Chinook salmon, respectively (Eggers and Clark in prep.).

Currently ADF&G has established 290 escapement goals (72 Chinook salmon stocks, 70 chum salmon stocks, 29 coho salmon stocks, 41 pink salmon stocks, and 78 sockeye salmon stocks) for stocks where escapements are routinely monitored (Munro and Volk 2010). Escapement goals have been established for target stocks in every salmon fishery that ADF&G manages. A variety of methods are used to estimate escapement goals. Most methods directly estimate MSY escapement range from stock productivity data as well as rearing and spawning habitat considerations. In the absence of stock-recruit information, many escapement goals are set based on the percentile method (Bue and Hasbrouck, (unpublished)). For stocks with high contrast in historical escapement data, the escapement goal is the central 50 percentile range of historical escapements and for stocks with low contrast or low harvest rates, the escapement goal is the central 85 percentile of historical escapements. Eggers and Clark (in prep) show that the percentile method provides a reasonable and conservative proxy for MSY escapement goal ranges. Computer simulations demonstrate that results from the percentile method are virtually equal to the actual MSY escapement range (Eggers and Clark in prep.) if the stock is exploited in a manner that provides MSY

(Figure 2). The simulations also demonstrate that the 25 percentile of historical escapements is well above the lower bound of the MSY escapement goal range, except for situations where the stock is heavily exploited above the level that provides for MSY (Figure 2). For situations where the stock is exploited below MSY levels, the percentile method estimates escapements above the MSY escapement range (Figure 2).

A meta analysis of stock-recruit data from ADF&G salmon stocks (42 sockeye salmon stocks, 7 Chinook salmon stocks, 5 coho salmon stocks, 6 chum salmon stocks, and 7 pink salmon stocks) demonstrates that escapement goals estimated by applying the percentile method were consistent with or above MSY escapement ranges as well as the established ADF&G goals for stocks where the MSY escapement goal was estimable (Eggers and Clark in prep). There were several sockeye salmon stocks where the percentile method escapement goals appeared less conservative than the meta-analysis MSYs or the ADF&G established escapement goals. In these cases, there was a demonstrated lack of density dependence in the stock recruit data which precluded a statistically significant estimate of the MSY escapement level. In these cases, escapement goals were established based on yield analyses with escapement goals based on consistent and high levels of yield. The fact that the central 50 percentile escapement ranges were above the MSY escapement range for most stocks demonstrates that salmon are generally exploited below MSY. Fishing is constrained during weak runs and available surpluses with strong runs are rarely achieved due to conservative fishery management, market constraints, or limited fishing power.

State of Alaska's Salmon Status Determination

The State of Alaska stock assessment and fishery management system, as embodied in the *Escapement Goal Policy* (EGP, 5 AAC39.223) and *Policy for the Management of Sustainable Salmon Fisheries* (PMSSF, 5 AAC 39.222) is consistent with NS1. Escapement goals are based on direct assessments of MSY escapement level (S_{msy}) from stock recruit analysis (i.e., BEG) or a reasonable proxy (i.e., SEG) (c.f. Munro and Volk, 2010). Escapement goals are specified as a range or a lower bound threshold. In general, escapement goal ranges produce 90% of MSY, and escapements are considered neutral within the range. Because yield is relatively flat across escapements that constitute an escapement goal range, these ranges give managers the flexibility to moderate fishing to protect stocks of weak runs that are commonly exploited in mixed stock fisheries.

Alaska's salmon fisheries are managed to maintain escapement within levels that provide for MSY (S_{msy}), escapements are assessed on an annual basis, all appropriate reference points are couched in terms of escapement level, and status determinations are made based on the stock's level of escapements. Three levels of concern are defined in the PMSSF—yield, management, and conservation. The level of concern relevant to status determination is the management concern. A management concern results from a continuing or anticipated inability to maintain escapements within the escapement goal range or above the threshold. Thus, the lower range or threshold of escapement goals is consistent with NS1 minimum stock size threshold and a determination of a management concern is equivalent to a determination of an overfished state in NS1. Overfishing is defined in the PMSSF as a level of fishing that results in a management or conservation concern. With the determination of a management concern, ADF&G and the Board of Fisheries are required to develop an action plan to address the concern. This may include measures to restore and protect salmon habitat, identification of salmon stock rebuilding goals and

objectives, implementation of specific management actions needed to achieve rebuilding goals and objectives, and development of performance measures appropriate for monitoring and gauging the effectiveness of the action plan.

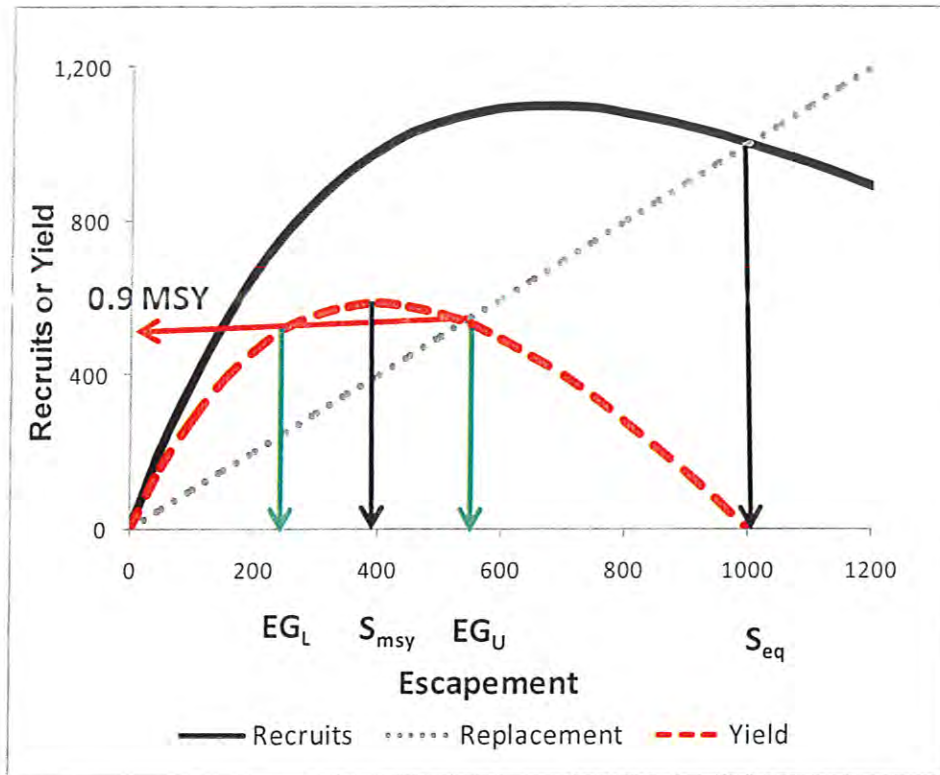
ADF&G reviews salmon escapement goals and stock status for each salmon management area on a 3-year cycle, which is consistent with Board of Fisheries cycle of regulatory review of salmon fisheries by management area. Escapement goal and stock status reviews are prepared prior to the Board of Fisheries review. These documents for Southeast Alaska include DerHovanisian et al (2005), Eggers and Heintz (2008), Heintz et al (2008), Eggers et al. (2008), McPherson et al. (2008), Shaul et al.(2008); Prince William Sound includes Evenson et al. (2005) , Lower Cook Inlet includes Otis and Szarzi (2007), Upper Cook Inlet includes Bue and Hasbrouck (2001), Fair et al. (2007), Kodiak includes Nelson et al (2005), Chignik includes Witteveen et al. (2007), Alaska Peninsula includes Nelson et al. (2006), Bristol Bay includes Baker et al., (2005), and the Arctic-Yukon-Kuskokwim Region includes Brannan et al. (2007) and Molyneux and Brannan (2006).

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$$R = \alpha S \exp(-\beta S)$$

$$Y = R - S$$

$$S_{msy}: (1 - \beta S_{msy}) \alpha \exp(-\beta S_{msy}) = 1$$

$$S_{eq} = \ln(\alpha) / \beta$$

$$R_{msy} = \alpha S_{msy} \exp(-\beta S_{msy})$$

$$MSY = R_{msy} - S_{msy}$$

$$EG_L, EG_U: \alpha EG_{L \text{ or } U} \exp(-\beta EG_{L \text{ or } U}) \geq 0.9 MSY$$

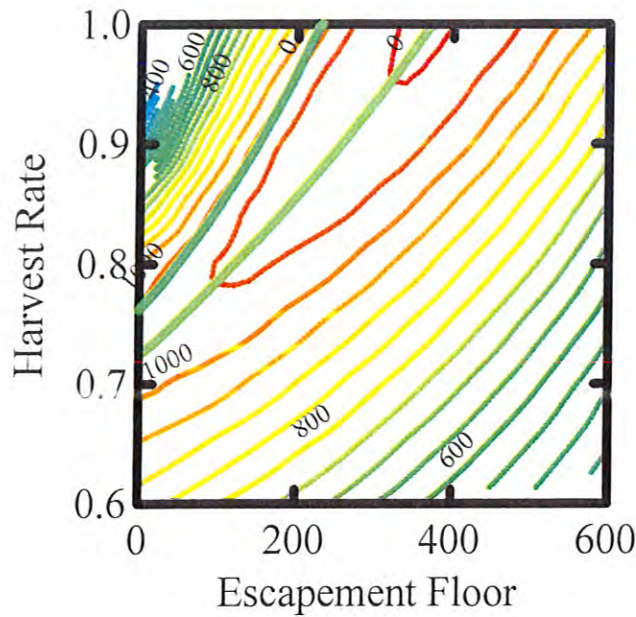
$$U_{msy} = MSY / R_{msy}$$

$$U_{of} = 1 - \frac{1}{\alpha}$$

Figure 1. Biological reference points associated with the Ricker stock-recruit model (R) and Ricker yield (Y) model, included are maximum sustained yield (MSY) escapement (S_{msy}), recruits at MSY escapement (R_{msy}), equilibrium escapement (S_{eq}), the lower end (EG_L) and upper end (EG_U) of escapement goal range, the MSY harvest rate (U_{msy} , the slope of line tangent to R at S_{msy}), and the overfishing harvest rate (U_{of} , the slope of line tangent to R at the origin)

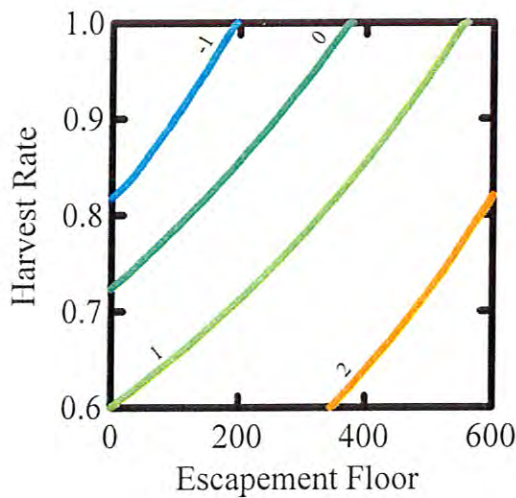
Catch with Central 50 %-tile

In alpha = 2



Central 50 %-tile Rating

In alpha = 2



25 Percentile Rating

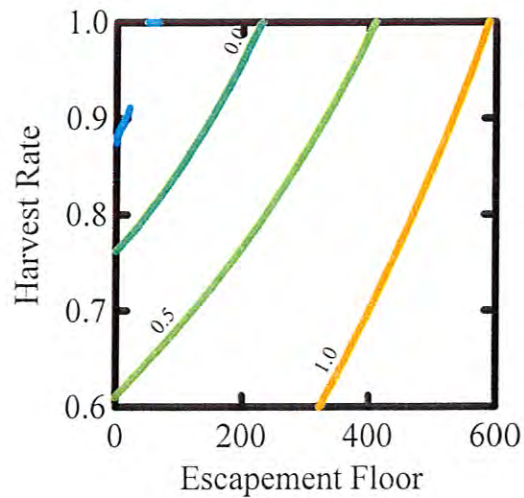


Figure 2. Comparison of escapement goals based on the “percentile method” and actual MSY escapement goal range based on simulations of yield over space of possible harvest policies (escapement floor with constant harvest rate for runs above the escapement floor, with constant harvest rate policy on the y-axis, and constant escapement policy on the upper x-axis). Upper panel: Catch and line of zero rating of the central 50 percentile range, and the 25 percentile lower escapement goal (note that negative, positive, and zero rating is lower than, greater than, and equal to the MSY escapement goal range, respectively). Lower left panel: Rating of central 50 percentile escapement range of historical escapements. Lower right panel: Rating of and the lower escapement range based on 25 percentile of historical escapement (note that a negative, positive and zero rating is lower than, greater than, and equal to lower MSY escapement goal, respectively).

Appendix 1

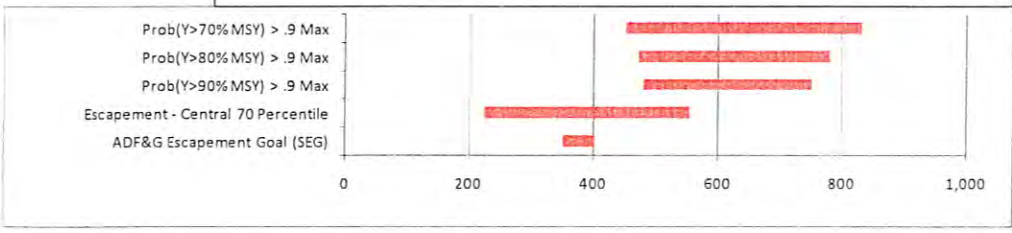
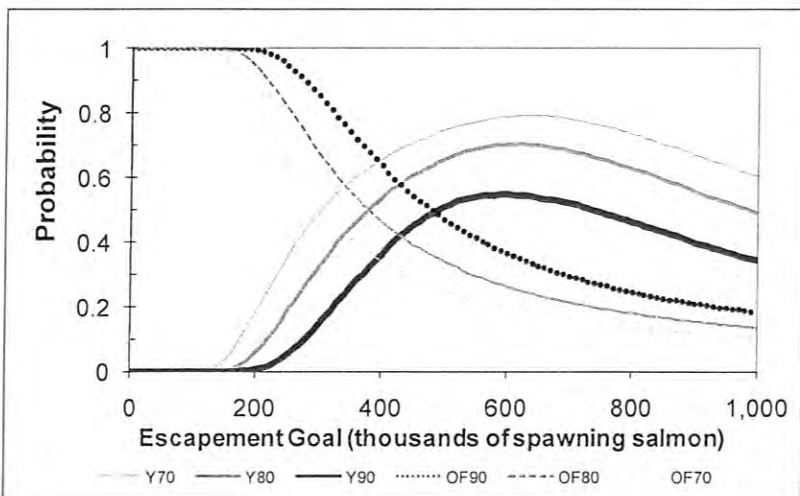
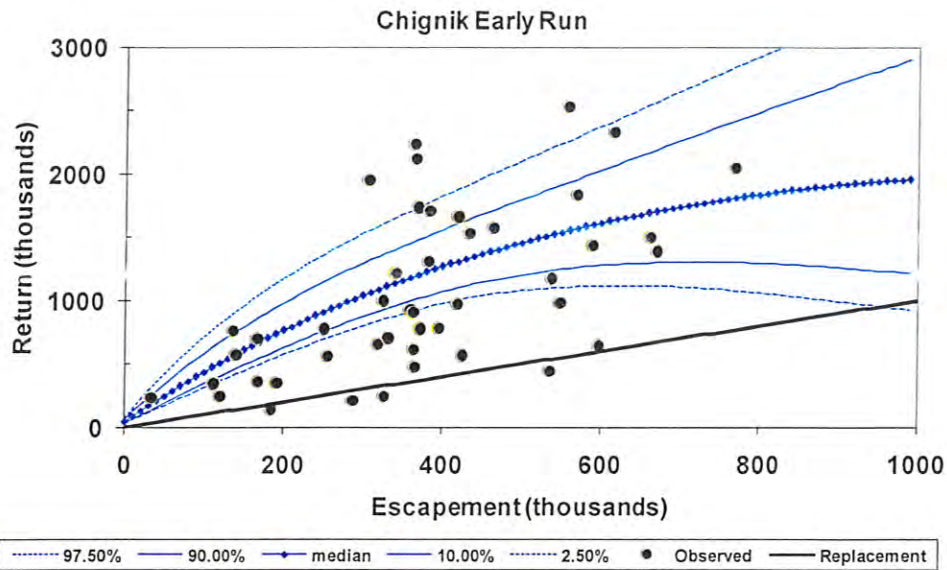
Example: Chignik River Sockeye Salmon

The stock assessment data and fishery management system for Chignik River sockeye salmon is described and provided as an example of the type of data and methods used to set escapement goals. The Chignik River sockeye salmon consists of two distinct stocks. The early run spawns in the upper portions of the Chignik watershed and rears in Black Lake; the late run spawns in the lower areas of the watershed and rear in Chignik Lake. Escapement for this stock has been continuously monitored since the establishment of the Chignik River weir in 1925. The stocks have segregated run timing, and catch and escapement age and stock composition available since the 1950s. Escapement goals for Chignik early-run sockeye salmon (400 thousand minimum) and the late-run (250 thousand minimum) were established in the early 1970's. Initial escapement goals were set based on Ricker stock - recruit analysis and initial goals and reflected the MSY escapement level. These goals were later modified to a range to be consistent with the escapement goal policy, escapement goals are periodically reviewed commensurate with new productivity data. The current escapement goal for the early-run (350 – 400 thousand spawners) was established in 2005 and current escapement goal for the late-run (200 – 400 thousand) was established in 2007.

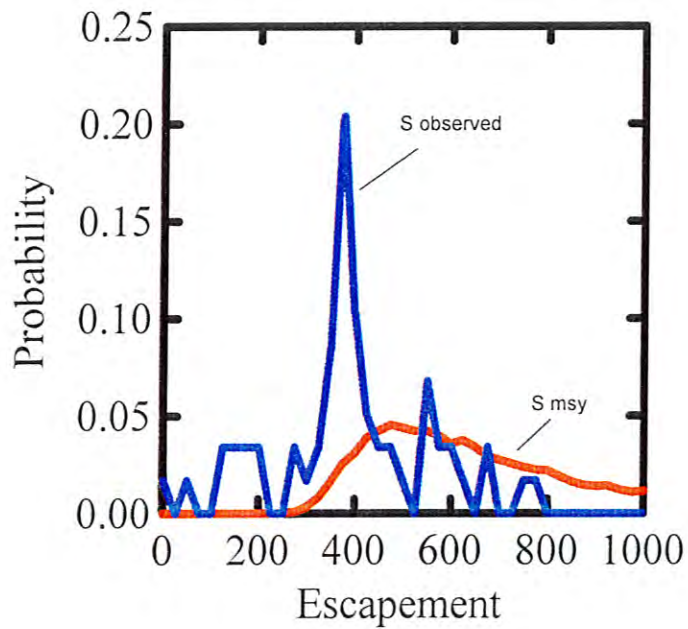
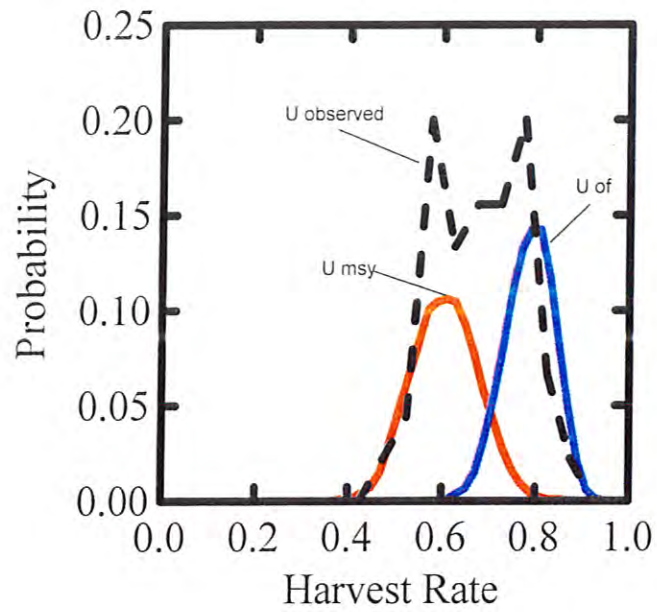
Because of the long-term stock assessment program, stock recruit data available for the 1952 to 1997 brood years for both the Chignik early-run (Appendix Figure 1) and late-run stocks (Appendix Figure 3). To illustrate the methods and process in determining escapement goals, a Bayesian stock recruit analysis was conducted for the early- and late-run Chignik sockeye stocks. The Ricker stock recruit model was fit to this data with MCMC simulations. This method provided explicit estimates of uncertainty in the stock-recruit model and associated biological reference points. In addition, the distribution of predicted yield and predicted recruits was estimated over a range of possible escapement goals, to provide probabilistic estimates of the expected recruits, and associated yield, and likelihood of overfishing over the range of possible escapement goals.

For the early-run stock there is a lack of density dependence in the stock-recruit data, which is reflected in increasing uncertainty (increased bounds of the uncertainty envelope) in the stock – recruit model with increasing escapement (Appendix Figure 1); in the low probability of achieving MSY associated with, as well as the broad and skewed nature of the yield profiles (Appendix Figure 2); and in the broad and skewed posterior distribution for S_{msy} (Appendix Figure 2). For the early-run Chignik sockeye salmon stock, stock-recruit analysis is not definitive in identifying the MSY escapement level. The current escapement goal for the early-run stock appears to be less than S_{msy} ; however on inspection of the stock recruit data escapements in the current escapement range have consistently produce high yields and are therefore consistent with MSY. In spite of the uncertainty in S_{msy} for this stock, the risk of overfishing is low with the current escapement goal (Appendix Figure 1). Because the production is high and consistent (only 4 of 46 years has the surplus production been less than replacement) there is less uncertainty in the estimated MSY harvest rate and the overfishing harvest rates and reflected in the posterior distributions for these reference points (Appendix Figure 2). Historical exploitation rates have been generally consistent with MSY harvest rates, and well below the overfishing harvest rate (Appendix Figure 2). There have been several years where the harvest rate has approached the overfishing harvest rate; however these occurred on large runs and escapement exceeded the escapement goal.

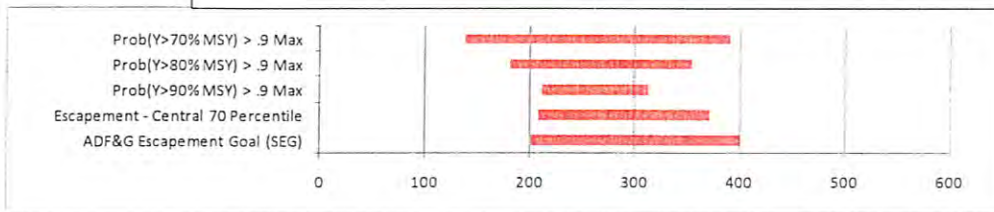
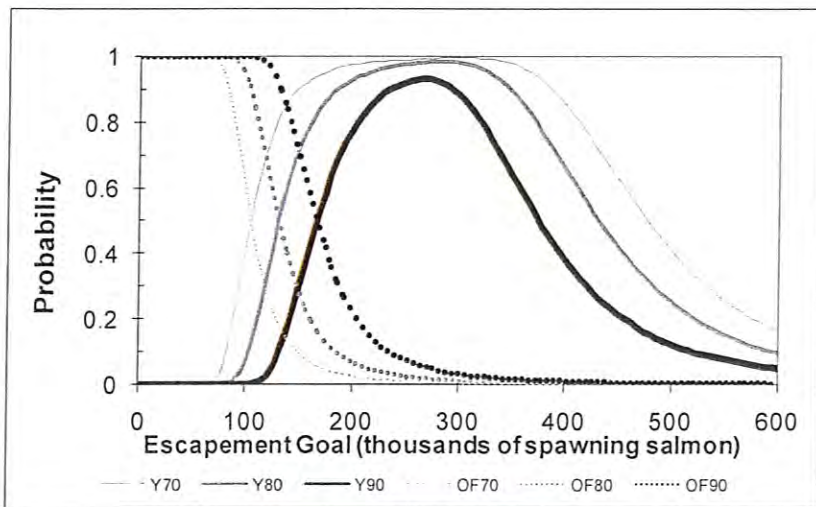
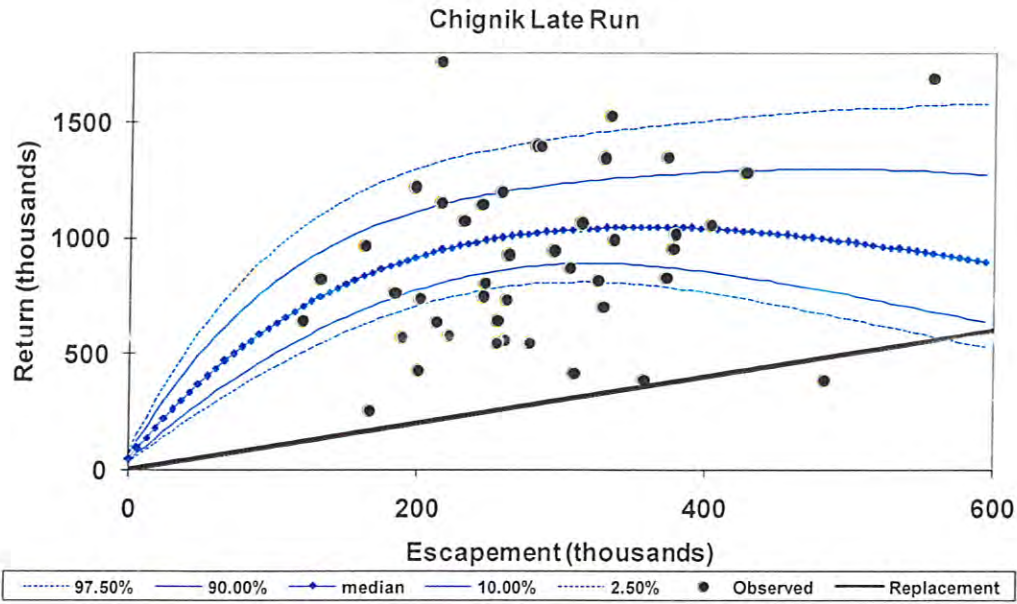
For the late-run stock, there is more density dependence in the stock recruit data (Appendix Figure 3), reflected in the relatively tighter confidence envelope in the stock recruit model; in the relatively high probability of achieving MSY for escapements in the MSY escapement range reflected in the yield profiles (Appendix Figure 3); the very low probability of overfishing with the current escapement goal; and in the relatively tight posterior distribution of S_{msy} (Appendix Figure 4). For the late-run Chignik sockeye salmon stock, stock-recruit analysis is very definitive in identifying the MSY escapement level and consistent with the current escapement goal for this stock. Because the production is high and consistent (only 1 of 46 years has the surplus production been less than replacement) there is clear definition of the MSY harvest rate and the overfishing harvest rates as reflected in the tight posterior distributions for these reference points (Appendix Figure 4). Because the weir is relatively close to the fishery, the in-season assessments are highly accurate, and the fishery has been tightly managed. Historical escapements have been maintained within the escapement goal; harvest rates have been consistent with MSY harvest rates; and harvest rates well below the overfishing harvest rate (Appendix Figure 4). Because of the exploitation history, the escapement goal based on the percentile method is consistent with MSY and current escapement goal (Appendix Figure 3).



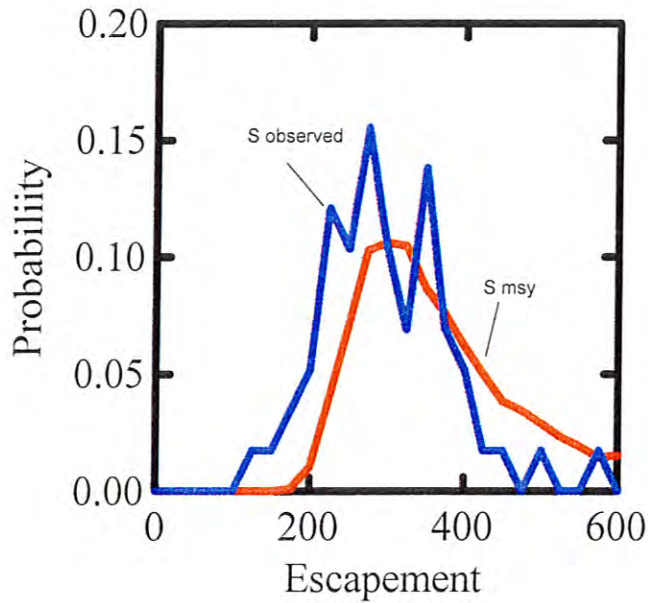
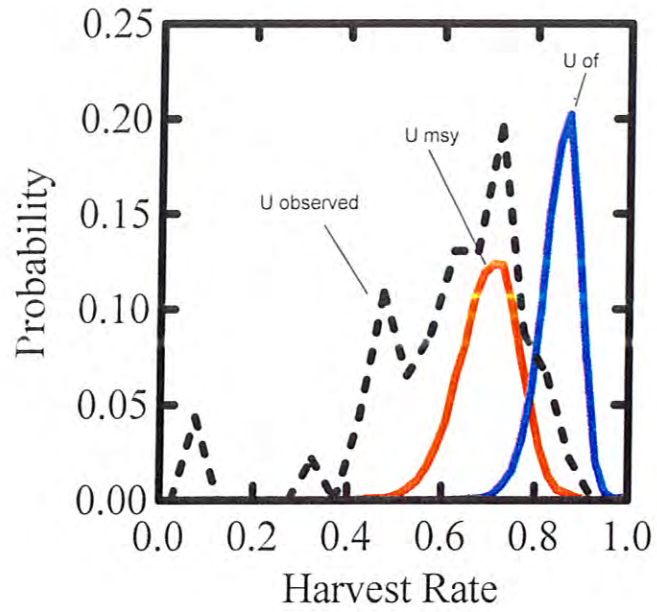
Appendix Figure 1. Upper panel: Recruits from parent escapement for the Chignik early-run sockeye, 1952 – 1997 brood years, with the envelope of uncertainty (2.5, 10, median, 90, and 97.5 percentiles) in the fitted Ricker stock recruit model. Lower panel: Yield profiles defined as probability that yield is at least 70, 80, and 90 percent of maximum sustained yield (MSY) at potential escapement goals; overfishing profiles defined as probability that escapement above the 70, 80, and 90 percent MSY yield escapement level; range of escapements for which yields are within 90% of max for each yield profile, central 70 percentile range of historical escapement, and the ADF&G escapement goal



Appendix Figure 2. Upper panel: Posterior distributions of MSY harvest rate estimated from Ricker model fit and the distribution of observed harvest rate for early run Chignik sockeye salmon. Lower panel: Posterior distributions of MSY escapement level from Ricker model fit and the distribution of observed escapement for early run Chignik sockeye salmon.



Appendix Figure 3. Upper panel: Recruits from parent escapement for the Chignik late-run sockeye salmon, 1952 – 1997 brood years, with the envelope of uncertainty (2.5, 10, median, 90, and 97.5 percentiles) in the fitted Ricker stock recruit model. Lower panel: Yield profiles defined as probability that yield is at least 70, 80, and 90 percent of maximum sustained yield (MSY) at potential escapement goals; overfishing profiles defined as probability that escapement above the 70, 80, and 90 percent MSY yield escapement level; range of escapements for which yields are within 90% of max for each yield profile, central 70 percentile range of historical escapement, and the ADF&G escapement goal



Appendix Figure 4. Upper panel: Posterior distributions of MSY harvest rate estimated from Ricker model fit and the distribution of observed harvest rate for early run Chignik sockeye salmon. Lower panel: Posterior distributions of MSY escapement level from Ricker model fit and the distribution of observed escapement for late run Chignik sockeye salmon.

5 AAC 39.222. POLICY FOR THE MANAGEMENT IS SUSTAINABLE SALMON FISHERIES.

(a) The Board of Fisheries (board) and Department of Fish and Game (department) recognize that

(1) while, in the aggregate, Alaska's salmon fisheries are healthy and sustainable largely because of abundant pristine habitat and the application of sound, precautionary, conservation management practices, there is a need for a comprehensive policy for the regulation and management of sustainable salmon fisheries;

(2) in formulating fishery management plans designed to achieve maximum or optimum salmon production, the board and department must consider factors including environmental change, habitat loss or degradation, data uncertainty, limited funding for research and management programs, existing harvest patterns, and new fisheries or expanding fisheries;

(3) to effectively assure sustained yield and habitat protection for wild salmon stocks, fishery management plans and programs require specific guiding principles and criteria, and the framework for their application contained in this policy.

(b) The goal of the policy under this section is to ensure conservation of salmon and salmon's required marine and aquatic habitats, protection of customary and traditional subsistence uses and other uses, and the sustained economic health of Alaska's fishing communities.

(c) Management of salmon fisheries by the state should be based on the following principles and criteria:

(1) wild salmon stocks and the salmon's habitats should be maintained at levels of resource productivity that assure sustained yields as follows:

(A) salmon spawning, rearing, and migratory habitats should be protected as follows:

(i) salmon habitats should not be perturbed beyond natural boundaries of variation;

(ii) scientific assessments of possible adverse ecological effects of proposed habitat alterations and the impacts of the alterations on salmon populations should be conducted before approval of a proposal;

(iii) adverse environmental impacts on wild salmon stocks and the salmon's habitats should be assessed;

(iv) all essential salmon habitat in marine, estuarine, and freshwater ecosystems and access of salmon to these habitats should be protected; essential habitats include spawning and incubation areas, freshwater rearing areas, estuarine and nearshore rearing areas, offshore rearing areas, and migratory pathways;

(v) salmon habitat in fresh water should be protected on a watershed basis, including appropriate management of riparian zones, water quality, and water quantity;

(B) salmon stocks should be protected within spawning, incubating, rearing, and migratory habitats;

(C) degraded salmon productivity resulting from habitat loss should be assessed, considered, and controlled by affected user groups, regulatory agencies, and boards when making conservation and allocation decisions;

(D) effects and interactions of introduced or enhanced salmon stocks on wild salmon stocks should be assessed; wild salmon stocks and fisheries on those stocks should be protected from adverse impacts from artificial propagation and enhancement efforts;

(E) degraded salmon spawning, incubating, rearing, and migratory habitats should be restored to natural levels of productivity where known and desirable;

(F) ongoing monitoring should be conducted to determine the current status of habitat and the effectiveness of restoration activities;

(G) depleted salmon stocks should be allowed to recover or, where appropriate, should be actively restored; diversity should be maintained to the maximum extent possible, at the genetic, population, species, and ecosystem levels;

(2) salmon fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning as follows:

(A) salmon spawning escapements should be assessed both temporally and geographically; escapement monitoring programs should be appropriate to the scale, intensity, and importance of each salmon stock's use;

(B) salmon escapement goals, whether sustainable escapement goals, biological escapement goals, optimal escapement goals, or inriver run goals, should be established in a manner consistent with sustained yield; unless otherwise directed, the department will manage Alaska's salmon fisheries, to the extent possible, for maximum sustained yield;

(C) salmon escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the salmon stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the salmon stock measured;

(D) salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of size range, sex ratio, and other population attributes;

(E) impacts of fishing, including incidental mortality and other human-induced mortality, should be assessed and considered in harvest management decisions;

(F) salmon escapement and harvest management decisions should be made in a manner that protects non-target salmon stocks or species;

(G) the role of salmon in ecosystem functioning should be evaluated and considered in harvest management decisions and setting of salmon escapement goals;

(H) salmon abundance trends should be monitored and considered in harvest management decisions;

(3) effective management systems should be established and applied to regulate human activities that affect salmon as follows:

(A) salmon management objectives should be appropriate to the scale and intensity of various uses and the biological capacities of target salmon stocks;

(B) management objectives should be established in harvest management plans, strategies, guiding principles, and policies, such as for mixed stock fishery harvests, fish disease, genetics, and hatchery production, that are subject to periodic review;

(C) when wild salmon stocks are fully allocated, new fisheries or expanding fisheries should be restricted, unless provided for by management plans or by application of the board's allocation criteria;

(D) management agencies should have clear authority in statute and regulation to

(i) control all sources of fishing mortality on salmon;

(ii) protect salmon habitats and control non-fishing sources of mortality;

(E) management programs should be effective in

(i) controlling human-induced sources of fishing mortality and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement;

(ii) protecting salmon habitats and controlling collateral mortality and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement;

(F) fisheries management implementation and outcomes should be consistent with regulations, regulations should be consistent with statutes, and effectively carry out the purpose of this section;

(G) the board will recommend to the commissioner the development of effective joint research, assessment, and management arrangements with appropriate management agencies and bodies for salmon stocks that cross state, federal, or international jurisdictional boundaries; the board will recommend the coordination of appropriate procedures for effective monitoring, compliance, control, and enforcement with those of other agencies, states, or nations;

(H) the board will work, within the limits of its authority, to assure that

- (i) management activities are accomplished in a timely and responsive manner to implement objectives, based on the best available scientific information;
- (ii) effective mechanisms for the collection and dissemination of information and data necessary to carry out management activities are developed, maintained, and utilized;
- (iii) management programs and decision-making procedures are able to clearly distinguish, and effectively deal with, biological and allocation issues;

(I) the board will recommend to the commissioner and legislature that adequate staff and budget for research, management, and enforcement activities be available to fully implement sustainable salmon fisheries principles;

(J) proposals for salmon fisheries development or expansion and artificial propagation and enhancement should include assessments required for sustainable management of existing salmon fisheries and wild salmon stocks;

(K) plans and proposals for development or expansion of salmon fisheries and enhancement programs should effectively document resource assessments, potential impacts, and other information needed to assure sustainable management of wild salmon stocks;

(L) the board will work with the commissioner and other agencies to develop effective processes for controlling excess fishing capacity;

(M) procedures should be implemented to regularly evaluate the effectiveness of fishery management and habitat protection actions in sustaining salmon populations, fisheries, and habitat, and to resolve associated problems or deficiencies;

(N) conservation and management decisions for salmon fisheries should take into account the best available information on biological, environmental, economic, social, and resource use factors;

(O) research and data collection should be undertaken to improve scientific and technical knowledge of salmon fisheries, including ecosystem interactions, status of salmon populations, and the condition of salmon habitats;

(P) the best available scientific information on the status of salmon populations and the condition of the salmon's habitats should be routinely updated and subject to peer review;

(4) public support and involvement for sustained use and protection of salmon resources should be sought and encouraged as follows:

(A) effective mechanisms for dispute resolution should be developed and used;

(B) pertinent information and decisions should be effectively disseminated to all interested parties in a timely manner;

(C) the board's regulatory management and allocation decisions will be made in an open process with public involvement;

(D) an understanding of the proportion of mortality inflicted on each salmon stock by each user group, should be promoted, and the burden of conservation should be allocated across user groups in a manner consistent with applicable state and federal statutes, including AS 16.05.251 (e) and AS 16.05.258 ; in the absence of a regulatory management plan that otherwise allocates or restricts harvests, and when it is necessary to restrict fisheries on salmon stocks where there are known conservation problems, the burden of conservation shall be shared among all fisheries in close proportion to each fisheries' respective use, consistent with state and federal law;

(E) the board will work with the commissioner and other agencies as necessary to assure that adequately funded public information and education programs provide timely materials on salmon conservation, including habitat requirements, threats to salmon habitat, the value of salmon and habitat to the public and ecosystem (fish and wildlife), natural variability and population dynamics, the status of salmon stocks and fisheries, and the regulatory process;

(5) in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively as follows:

(A) a precautionary approach, involving the application of prudent foresight that takes into account the uncertainties in salmon fisheries and habitat management, the biological, social, cultural, and economic risks, and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality; a precautionary approach requires

- (i) consideration of the needs of future generations and avoidance of potentially irreversible changes;
- (ii) prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly;
- (iii) initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species;
- (iv) that where the impact of resource use is uncertain, but likely presents a measurable risk to sustained yield, priority should be given to conserving the productive capacity of the resource;
- (v) appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production;

(B) a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

(d) The principles and criteria for sustainable salmon fisheries shall be applied, by the department and the board using the best available information, as follows:

(1) at regular meetings of the board, the department will, to the extent practicable, provide the board with reports on the status of salmon stocks and salmon fisheries under consideration for regulatory changes, which should include

(A) a stock-by-stock assessment of the extent to which the management of salmon stocks and fisheries is consistent with the principles and criteria contained in the policy under this section;

(B) descriptions of habitat status and any habitat concerns;

(C) identification of healthy salmon stocks and sustainable salmon fisheries;

(D) identification of any existing salmon escapement goals, or management actions needed to achieve these goals, that may have allocative consequences such as the

(i) identification of a new fishery or expanding fishery;

(ii) identification of any salmon stocks, or populations within stocks, that present a concern related to yield, management, or conservation; and

(iii) description of management and research options to address salmon stock or habitat concerns;

(2) in response to the department's salmon stock status reports, reports from other resource agencies, and public input, the board will review the management plan, or consider developing a management plan, for each affected salmon fishery or stock; management plans will be based on the principles and criteria contained in this policy and will

(A) contain goals and measurable and implementable objectives that are reviewed on a regular basis and utilize the best available scientific information;

(B) minimize the adverse effects on salmon habitat caused by fishing;

(C) protect, restore, and promote the long-term health and sustainability of the salmon fishery and habitat;

(D) prevent overfishing; and

(E) provide conservation and management measures that are necessary and appropriate to promote maximum or optimum sustained yield of the fishery resource;

(3) in the course of review of the salmon stock status reports and management plans described in (1) and (2) of this subsection, the board, in consultation with the department, will determine if any new fisheries or expanding fisheries, stock yield concerns, stock management concerns, or stock conservation concerns exist; if so, the board will, as appropriate, amend or develop salmon fishery management plans to address these concerns; the extent of regulatory action, if any, should be commensurate with the level of concerns and range from milder to stronger as concerns range from new and expanding salmon fisheries through yield concerns, management concerns, and conservation concerns;

(4) in association with the appropriate management plan, the department and the board will, as appropriate, collaborate in the development and periodic review of an action plan for any new or expanding salmon fisheries, or stocks of concern; action plans should contain goals, measurable and implementable objectives, and provisions, including

(A) measures required to restore and protect salmon habitat, including necessary coordination with other agencies and organizations;

(B) identification of salmon stock or population rebuilding goals and objectives;

(C) fishery management actions needed to achieve rebuilding goals and objectives, in proportion to each fishery's use of, and hazards posed to, a salmon stock;

(D) descriptions of new or expanding salmon fisheries, management concern, yield concern, or conservation concern; and

(E) performance measures appropriate for monitoring and gauging the effectiveness of the action plan that are derived from the principles and criteria contained in this policy;

(5) each action plan will include a research plan as necessary to provide information to address concerns; research needs and priorities will be evaluated periodically, based on the effectiveness of the monitoring described in (4) of this subsection;

(6) where actions needed to regulate human activities that affect salmon and salmon's habitat that are outside the authority of the department or the board, the department or board shall correspond with the relevant authority, including the governor, relevant boards and commissions, commissioners, and chairs of appropriate legislative committees, to describe the issue and recommend appropriate action.

(e) Nothing in the policy under this section is intended to expand, reduce, or be inconsistent with, the statutory regulatory authority of the board, the department, or other state agencies with regulatory authority that impacts the fishery resources of the state.

(f) In this section, and in implementing this policy,

(1) "allocation" means the granting of specific harvest privileges, usually by regulation, among or between various user groups; "allocation" includes quotas, time periods, area restrictions, percentage sharing of stocks, and other management measures providing or limiting harvest opportunity;

(2) "allocation criteria" means the factors set out in AS 16.05.251 (e) considered by the board as appropriate to particular allocation decisions under 5 AAC 39.205, 5 AAC 75.017, and 5 AAC 77.007;

(3) "biological escapement goal" or "(BEG)" means the escapement that provides the greatest potential for maximum sustained yield; BEG will be the primary management objective for the escapement unless an optimal escapement or inriver run goal has been adopted; BEG will be developed from the best available biological information, and should be scientifically defensible on the basis of available biological information; BEG will be determined by the department and will be expressed as a range based on factors such as salmon stock productivity and data uncertainty; the department will seek to maintain evenly distributed salmon escapements within the bounds of a BEG;

(4) "burden of conservation" means the restrictions imposed by the board or department upon various users in order to achieve escapement, rebuild, or in some other way conserve a specific salmon stock or group of stocks; this burden, in the absence of a salmon fishery management plan, will be generally applied to users in close proportion to the users' respective harvest of the salmon stock;

(5) "chronic inability" means the continuing or anticipated inability to meet escapement thresholds over a four to five year period, which is approximately the generation time of most salmon species;

(6) "conservation concern" means concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a stock above a sustained escapement threshold (SET); a conservation concern is more severe than a management concern;

(7) "depleted salmon stock" means a salmon stock for which there is a conservation concern;

(8) "diversity", in a biological context, means the range of variation exhibited within any level of organization, such as among genotypes within a salmon population, among populations within a salmon stock, among salmon stocks within a species, among salmon species within a community, or among communities within an ecosystem;

(9) "enhanced salmon stock" means a stock of salmon that is undergoing specific manipulation, such as hatchery augmentation or lake fertilization, to enhance its productivity above the level that would naturally occur; "enhanced salmon stock" includes an introduced stock, where no wild salmon stock had occurred before, or a wild salmon stock undergoing manipulation, but does not include a salmon stock undergoing rehabilitation, which is intended to restore a salmon stock's productivity to a higher natural level;

(10) "escapement" means the annual estimated size of the spawning salmon stock; quality of the escapement may be determined not only by numbers of spawners, but also by factors such as sex ratio, age composition, temporal entry into the system, and spatial distribution within the salmon spawning habitat;

(11) "expanding fishery" means a salmon fishery in which effective harvesting effort has recently increased significantly beyond historical levels and where the increase has not resulted from natural fluctuations in salmon abundance;

(12) "expected yields" mean levels at or near the lower range of recent historic harvests if they are deemed sustainable;

(13) "genetic" means those characteristics (genotypic) of an individual or group of salmon that are expressed genetically, such as allele frequencies or other genetic markers;

(14) "habitat concern" means the degradation of salmon habitat that results in, or can be anticipated to result in, impacts leading to yield, management, or conservation concerns;

(15) "harvestable surplus" means the number of salmon from a stock's annual run that is surplus to escapement needs and can reasonably be made available for harvest;

(16) "healthy salmon stock" means a stock of salmon that has annual runs typically of a size to meet escapement goals and a potential harvestable surplus to support optimum or maximum sustained yield;

(17) "incidental harvest" means the harvest of fish, or other species, that is captured in addition to the target species of a fishery;

(18) "incidental mortality" means the mortality imposed on a salmon stock outside of directed fishing, and mortality caused by incidental harvests, interaction with fishing gear, habitat degradation, and other human-related activities;

(19) "inriver run goal" means a specific management objective for salmon stocks that are subject to harvest upstream of the point where escapement is estimated; the inriver run goal will be set in regulation by the board and is comprised of the SEG, BEG, or OEG, plus specific allocations to inriver fisheries;

(20) "introduced stock" means a stock of salmon that has been introduced to an area, or portion of an area, where that stock had not previously occurred; an "introduced salmon stock" includes a salmon stock undergoing continued enhancement, or a salmon stock that is left to sustain itself with no additional manipulation;

(21) "management concern" means a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the SEG, BEG, OEG, or other specified management objectives for the fishery; a management concern is not as severe as a conservation concern;

(22) "maximum sustained yield" or "(MSY)" means the greatest average annual yield from a salmon stock; in practice, MSY is achieved when a level of escapement is maintained within a specific range on an annual basis, regardless of annual run strength; the achievement of MSY requires a high degree of management precision and scientific information regarding the relationship between salmon escapement and subsequent return; the concept of MSY should be interpreted in a broad ecosystem context to take into account species interactions, environmental changes, an array of ecosystem goods and services, and scientific uncertainty;

(23) "mixed stock fishery" means a fishery that harvests fish from a mixture of stocks;

(24) "new fishery" means a fishery that new units of effort or expansion of existing effort toward new species, areas, or time periods, results in harvest patterns substantially different from those in previous years, and the difference is not exclusively the result of natural fluctuations in fish abundance;

(25) "optimal escapement goal" or "(OEG)" means a specific management objective for salmon escapement that considers biological and allocative factors and may differ from the SEG or BEG; an OEG will be sustainable and may be expressed as a range with the lower bound above the level of SET, and will be adopted as a regulation by the board; the department will seek to maintain evenly distributed escapements within the bounds of the OEG;

(26) "optimum sustained yield" or "(OSY)" means an average annual yield from a salmon stock considered to be optimal in achieving a specific management objective other than maximum yield, such as achievement of a consistent level of sustained yield, protection of a less abundant or less productive salmon stock or species, enhancement of catch per unit effort in sport fishery, facilitation of a non-consumptive use, facilitation of a subsistence use, or achievement of a specific allocation;

(27) "overfishing" means a level of fishing on a salmon stock that results in a conservation or management concern;

(28) "phenotypic characteristics" means those characteristics of an individual or group of salmon that are expressed physically, such as body size and length at age;

(29) "rehabilitation" means efforts applied to a salmon stock to restore it to an otherwise natural level of productivity; "rehabilitation" does not include an enhancement, which is intended to augment production above otherwise natural levels;

(30) "return" means the total number of salmon in a stock from a single brood (spawning) year surviving to adulthood; because the ages of adult salmon (except pink salmon) returning to spawn varies, the total return from a brood year will occur over several calendar years; the total return generally includes those mature salmon from a single brood year that are harvested in fisheries plus those that compose the salmon stock's spawning escapement; "return" does not include a run, which is the number of mature salmon in a stock during a single calendar year;

(31) "run" means the total number of salmon in a stock surviving to adulthood and returning to the vicinity of the natal stream in any calendar year, composed of both the harvest of adult salmon plus the escapement; the annual run in any calendar year, except for pink salmon, is composed of several age classes of mature fish from the stock, derived from the spawning of a number of previous brood years;

(32) "salmon" means the five wild anadromous semelparous Pacific salmon species *Oncorhynchus* sp., except steelhead and cutthroat trout, native to Alaska as follows:

- (A) chinook or king salmon (*O. tshawytscha*);
- (B) sockeye or red salmon (*O. nerka*);
- (C) coho or silver salmon (*O. kisutch*);
- (D) pink or humpback salmon (*O. gorbuscha*); and
- (E) chum or dog salmon (*O. keta*);

(33) "salmon population" means a locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics, comprised of an entire stock or a component portion of a stock; the smallest uniquely identifiable spawning aggregation of genetically similar salmon used for monitoring purposes;

(34) "salmon stock" means a locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics or an aggregation of two or more interbreeding groups which occur within the same geographic area and is managed as a unit;

(35) "stock of concern" means a stock of salmon for which there is a yield, management, or conservation concern;

(36) "sustainable escapement goal" or "(SEG)" means a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate; the SEG is the primary management objective for the escapement, unless an optimal escapement or inriver run goal has been adopted by the board, and will be developed from the best available biological information; the SEG will be determined by the department and will be stated as a range that takes into account data uncertainty; the department will seek to maintain escapements within the bounds of the SEG;

(37) "sustainable salmon fishery" means a salmon fishery that persists and obtains yields on a continuing basis; characterized by fishing activities and habitat alteration, if any, that do not cause or lead to

undesirable changes in biological productivity, biological diversity, or ecosystem structure and function, from one human generation to the next;

(38) "sustained yield" means an average annual yield that results from a level of salmon escapement that can be maintained on a continuing basis; a wide range of average annual yield levels is sustainable; a wide range of annual escapement levels can produce sustained yields;

(39) "sustained escapement threshold" or "(SET)" means a threshold level of escapement, below which the ability of the salmon stock to sustain itself is jeopardized; in practice, SET can be estimated based on lower ranges of historical escapement levels, for which the salmon stock has consistently demonstrated the ability to sustain itself; the SET is lower than the lower bound of the BEG and lower than the lower bound of the SEG; the SET is established by the department in consultation with the board, as needed, for salmon stocks of management or conservation concern;

(40) "target species" or "target salmon stocks" means the main, or several major, salmon species of interest toward which a fishery directs its harvest;

(41) "yield" means the number or weight of salmon harvested in a particular year or season from a stock;

(42) "yield concern" means a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs; a yield concern is less severe than a management concern, which is less severe than a conservation concern;

(43) "wild salmon stock" means a stock of salmon that originates in a specific location under natural conditions; "wild salmon stock" may include an enhanced or rehabilitated stock if its productivity is augmented by supplemental means, such as lake fertilization or rehabilitative stocking; "wild salmon stock" does not include an introduced stock, except that some introduced salmon stocks may come to be considered "wild" if the stock is self-sustaining for a long period of time;

(44) "action point" means a threshold value for some quantitative indicator of stock run strength at which an explicit management action will be taken to achieve an optimal escapement goal.

History: Eff. 9/30/2000, Register 155; am 11/16/2000, Register 156; am 6/22/2001, Register 158
Authority: AS 16.05.251

5 AAC 39.223. POLICY FOR STATEWIDE SALMON ESCAPEMENT GOALS.

(a) The Department of Fish and Game (department) and the Board of Fisheries (board) are charged with the duty to conserve and develop Alaska's salmon fisheries on the sustained yield principle. Therefore, the establishment of salmon escapement goals is the responsibility of both the board and the department working collaboratively. The purpose of this policy is to establish the concepts, criteria, and procedures for establishing and modifying salmon escapement goals and to establish a process that facilitates public review of allocative issues associated with escapement goals.

(b) The board recognizes the department's responsibility to

(1) document existing salmon escapement goals for all salmon stocks that are currently managed for an escapement goal;

(2) establish biological escapement goals (BEG) for salmon stocks for which the department can reliably enumerate salmon escapement levels, as well as total annual returns;

(3) establish sustainable escapement goals (SEG) for salmon stocks for which the department can reliably estimate escapement levels when there is not sufficient information to enumerate total annual returns and the range of escapements that are used to develop a BEG;

(4) establish sustained escapement thresholds (SET) as provided in 5 AAC 39.222 (Policy for the Management of Sustainable Salmon Fisheries);

(5) establish escapement goals for aggregates of individual spawning populations with similar productivity and vulnerability to fisheries and for salmon stocks managed as units;

(6) review an existing, or propose a new, BEG, SEG and SET on a schedule that conforms, to the extent practicable, to the board's regular cycle of consideration of area regulatory proposals;

(7) prepare a scientific analysis with supporting data whenever a new BEG, SEG, or SET, or a modification to an existing BEG, SEG, or SET is proposed and, in its discretion, to conduct independent peer reviews of its BEG, SEG, and SET analyses;

(8) notify the public whenever a new BEG, SEG, or SET is established or an existing BEG, SEG, or SET is modified;

(9) whenever allocative impacts arise from any management actions necessary to achieve a new or modified BEG, SEG or SET, report to the board on a schedule that conforms, to the extent practicable, to the board's regular cycle of consideration of area regulatory proposals so that it can address allocation issues.

(c) In recognition of its joint responsibilities, and in consultation with the department, the board will

(1) take regulatory actions as may be necessary to address allocation issues arising from implementation of a new or modified BEG, SEG, and SET;

(2) during its regulatory process, review a BEG, SEG, or SET determined by the department and, with the assistance of the department, determine the appropriateness of establishing an optimal escapement goal (OEG); the board will provide an explanation of the reasons for establishing an OEG and provide, to the extent practicable, and with the assistance of the department, an estimate of expected differences in yield of any salmon stock, relative to maximum sustained yield, resulting from implementation of an OEG.

(d) Unless the context requires otherwise, the terms used in this section have the same meaning given those terms in 5 AAC 39.222(f) .

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