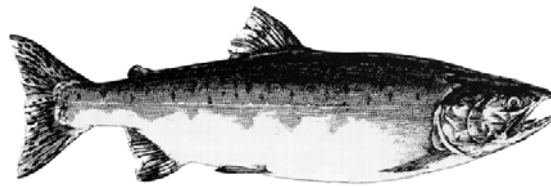


ENVIRONMENTAL ASSESSMENT
for
AMENDMENT 6
to the Fishery Management Plan for the
Salmon Fisheries off the Coast of Alaska
to

Revise Definitions of Overfishing



Responsible Agencies:
North Pacific Fishery Management Council
National Marine Fisheries Service
Alaska Department of Fish and Game

Responsible Official:
James W. Balsiger, Alaska Regional Administrator

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) addresses alternatives for meeting the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) provisions for national standard 1 (§301 (a)(1)) and Section 303(a)(10). National standard 1 states 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. The Act did not change the standard, but did change the definition of optimum yield and overfishing. Section 303(a)(10) of the Magnuson-Stevens Act requires that all Fishery Management Plans “specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing and rebuild the fishery.”

Language from the Magnuson-Stevens Act 1996.

National Standard 1: Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimal yield from each fishery for the United States fishing industry.

Overfishing: The terms “overfishing” and “overfished” mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.

The Magnuson-Stevens Act also required the Secretary of Commerce (Secretary) to establish advisory guidelines, based on the national standards and section 303(a)(10), to assist in the development of fishery management plans. This document examines alternative definitions of overfishing in accordance with the national standard guidelines (50 CFR 600.305).

Several alternatives were considered including establishment of minimum spawning escapement goals, optimum spawning escapement goals, a maximum exploitation rate, and analyzing existing management policies. Of these alternatives, only analyzing existing management policies was deemed to be a reasonable alternative for mixed stock salmon fisheries. Hence, the alternative examined were as follows:

Alternative 1: Status Quo. Do not revise the FMP with new definitions for overfishing.

Alternative 2: (preferred) Update FMP with new Magnuson-Stevens Act language and State of Alaska (State) management policies regarding overfishing. For Alternative 2, the overfishing definitions were created following overfishing policies of the State and the Pacific Salmon Commission (PSC) and following the framework provided by the national standard guidelines. The overfishing definition specifies objective and measurable criteria for identifying when the fishery is overfished or when overfishing is occurring. This analysis is provided in section 1.3.2.

The policies proposed as the overfishing definition, under Alternative 2, satisfy the intent of the Magnuson-Stevens Act. The salmon escapement goal policy adopted by the Alaska Department of Fish and Game (ADF&G) ensures that annual spawning escapement requirements are met (in appendix 3). Additionally, the Alaska Board of Fisheries (Board) policy for management of mixed stock salmon fisheries is consistent with sustained yield of wild fish stocks. The Pacific Salmon Treaty in Annex IV, chapter 3, as amended June 30, 1999¹, establishes conservative harvest rates for chinook stocks and provides for rebuilding of overfished chinook stocks (in appendix 4).

¹ “US/Canada bilateral agreement for the Southeast Alaska all-gear chinook catch” (BLA).

None of the alternatives contain implementing regulations and therefore the Regulatory Flexibility Act does not apply and review under Executive Order 12866 is not required.

1.0 INTRODUCTION

The salmon fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) off Alaska are managed under the FMP for Salmon Fisheries in the EEZ off the coast of Alaska. The North Pacific Fishery Management Council (Council) developed this FMP under the Magnuson-Stevens Act. The Secretary approved the FMP and it became effective in 1979. The FMP for Salmon Fisheries in the EEZ off the coast of Alaska was last revised in 1990.

The FMP defers management of the commercial troll fishery to the State of Alaska, to manage the fisheries consistent with State and Federal laws, including the US-Canada Pacific Salmon Treaty. The intended effect of the FMP is to conserve and manage the salmon resources in the North Pacific Ocean and to allow the troll fisheries in State and EEZ waters to be managed as one fishery. State management of the salmon fishery is based, by direction from the State constitution, on sustainable optimal yield. Regulations for the Alaska salmon fishery are made by the Board in abidance with State and Federal laws and with negotiated agreements within the Pacific Salmon Treaty. ADF&G manages the fishery inseason and issues emergency regulations to achieve conservation objectives and to implement allocation policies established by the Board. In 1997, NMFS and ADF&G prepared an EA for the salmon fisheries in the EEZ and State waters off the coast of Alaska that evaluates the deferral of regulation and management to the State. The EA concluded that the impacts on the target species by the current salmon fishery in southeast Alaska, due to a fishery policy of optimal sustainable yield, are such that produce optimum production of the stocks and healthy escapement levels. Moreover, management over the past several decades (since Statehood) has resulted in healthy salmon stocks for all species.

The State and the PSC have developed spawning escapement goals, harvest guidelines, and other management strategies that reflect and integrate the large number of factors affecting salmon productivity (e.g., annual changes in the number of salmon produced because of fluctuations in the salmon's marine and freshwater environments, annual changes in fishing patterns, management imprecision, annual changes in salmon migration routes, annual differences in relative abundance of various stocks in an area, etc.). Escapement goal ranges together with real-time escapement enumeration (i.e. visual counts from towers, weir counts, aerial survey counts, sonar counts) and intensive fishery monitoring programs, have been established for most of Alaska's major salmon stocks. In cases where the salmon returns have been below forecast levels, for example in 1997 and 1998 in Bristol Bay, the state closed the fishery to maintain its escapement goals, thus preventing overfishing.

Actions taken to amend the FMP or implement other regulations governing the fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson-Stevens Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA). None of the alternatives in this EA contain implementing regulations and therefore the Regulatory Flexibility Act does not apply and review under Executive Order 12866 is not required.

This EA addresses alternatives for meeting the NMFS guidelines drafted in response to the revised Magnuson-Stevens Act provisions for national standard 1. Under NEPA, an EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. Section 1 contains a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. Section 2 contains information on the biological and environmental impacts of the alternatives as

required by NEPA. Section 2 also addresses impacts on endangered species and marine mammals. The list of preparers is in Section 5.

In April 1998, the Council and its advisory bodies (the Advisory Panel (AP) and the Scientific and Statistical Committee (SSC)) reviewed a draft EA. A revised analysis was released for public review on April 29. In June 1998, the Council adopted the preferred alternative. In October 1998, the Alaska Fisheries Science Center (AFSC) stated it would not certify that the overfishing definitions comply with the national standard guidelines without a considerably more explicit analysis. The AFCS recognized that management of the salmon fisheries off the coast of Alaska is an extremely complicated process involving multiple jurisdictions and multiple stocks. The national standard guidelines provide a framework for determining the status of a stock to prevent overfishing and to provide for rebuilding if a stock is overfished, following the intent of national standard 1 of the Magnuson-Stevens Act.

Scientists from AFSC worked with scientists from the State to analyze how the overfishing policies of the State, including the PST, follow the framework of the national standard guidelines. The outcome of this analysis was that State salmon management, which is based on salmon biology and the best scientific and fishery information available, achieves the intent of national standard 1. This expanded analysis was presented to the Council and the SSC in February 1999. The Council and the SSC concurred that the expanded analysis complied with its intent for Amendment 6. The February analysis did not contain a minimum stock size threshold (MSST). NMFS decided to re-analyze the overfishing definitions to develop an MSST to comply with the national standard guidelines. The revised preferred alternative, detailed in the document, contains an MSST that was developed using parameters established by the State and the Pacific Salmon Treaty. In addition, the preferred alternative was revised to reflect changes in State salmon management and the 1999 amendment to the Pacific Salmon Treaty. In June 2001, the Council and its SSC reviewed the revised overfishing definitions and determined these definitions comply with the intent of the Amendment 6 adopted by the Council. On June 28, 2001, the AFCS certified, without reservations, that the subject overfishing definitions comply with the 50 CFR part 600 guidelines.

The proposed salmon overfishing definitions in this amendment adhere to the national standard guidelines to the extent possible, providing for reasonable accommodation of regional and individual fishery characteristics, to meet the requirements of the Magnuson-Stevens Act. The overfishing definitions are more explicit than the preferred alternative adopted by the Council in 1998, however, they adhere to the explicit intent of the Council that the overfishing definitions be based on State management of the salmon fisheries under the FMP. This analysis is explained under Alternative 2.

1.1 Stocks and Fisheries Covered by the Plan

This FMP covers the anadromous salmon stocks that originate primarily in Alaska, but include salmon caught in Alaskan waters that originate in British Columbia, Washington, Oregon, and Idaho (and perhaps northern California). Of the five salmon species that occur in Alaska, pink (*Oncorhynchus gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), coho (*O. kisutch*), and chinook (*O. tshawytscha*), only chinook and coho are targeted in EEZ waters. The number of separate stocks of these two species is unknown but is well into the hundreds. There are probably thousands of streams and rivers that support spawning populations (i.e. spawning aggregates). Managed stocks are aggregates of spawning populations. The number of ecological significant units (ESU) for chinook and coho salmon vulnerable to the southeast Alaska (SEAK) troll fishery is on the order of tens.

The FMP for the salmon fisheries allows commercial trolling in the EEZ off southeast Alaska (SEAK EEZ), and closes the remaining federal waters in central and western Alaska to commercial salmon fishing.² All other salmon fishing occurs in Alaska waters. The SEAK troll fishery is a mixed-stock, mixed species fishery that primarily targets chinook and coho salmon, with other salmon species taken incidentally. The troll fishery operates in both State and Federal waters, although, the majority of the catch and effort occurs in the State waters. The State collects fisheries information from the troll fishery as a whole and does not separate the fishery in the EEZ from the State fishery. The SEAK EEZ troll catch represents approximately 6% of the total chinook and coho landed by salmon fisheries in southeast Alaska (1991-1996 average). This fishery harvests less than one percent of the total harvest of pink, chum, and sockeye salmon occurring in southeast waters. The troll fishery has two seasons, the winter season, October 11 - April 14, and the summer season, April 15-September 30. The winter troll fishery is limited to within State waters.

Chinook salmon stocks originating in British Columbia and intercepted off or within Alaska by U.S. fishermen are under the jurisdiction of the Pacific Salmon Commission (PSC)³. Chinook salmon stocks originating in Washington, Oregon, Idaho, and California and caught off or within Alaska are also under the jurisdiction of the PSC because those stocks are also intercepted by Canadian fishermen. The chinook harvest target level is based on the Pacific Salmon Treaty, Annex IV, Chapter 3 Chinook Salmon (in appendix 4), from 1999 through 2008. The PST specifies a harvest based on a relationship between a pre-season Abundance Index (AI) generated by the Pacific Salmon Commission's Chinook Technical Committee and a target harvest rate specified in the PST. The PST also provides for an inseason adjustment to the harvest level based on an assessment of inseason data. This abundance-based system reduces the risk of overharvest at low stock abundance while allowing increases in harvest with increases in abundance, as with the management of the other salmon species in the southeast Alaska salmon fishery.

Coho salmon originate mainly in Alaska waters. The Board has primary jurisdiction over most of the salmon stocks originating in Alaska that are harvested off or within Alaska. The coho catch is managed to provide optimal yield of the many Alaska coho stocks present in the area while minimizing the catch of chinook salmon during chinook nonretention periods. ADF&G manages coho salmon to ensure escapement goals and to achieve Board allocation guidelines. ADF&G monitors all coho fisheries to determine if the number of coho salmon reaching inside areas will be adequate to provide for spawning requirements. ADF&G closes the fisheries by emergency order if the escapement goals are not being met. Escapement goals for the four main indicator stocks in Southeast Alaska have been met or exceeded every year since 1990. A recent history of high catches of wild stocks in the fisheries, combined with strong total returns to index areas, suggests that Southeast Alaska coho stocks are in excellent condition and capable of supporting sustainable fisheries.

In implementing the State's policy, ADF&G has the long-term goal of achieving maximum sustainable yield for Alaska's salmon fisheries. To this end, ADF&G has strived, within fiscal resources, to establish stock-specific escapement goal ranges with the midpoint being the optimal escapement level. Commensurate with this objective, ADF&G has strived to implement required data collection programs and management systems to achieve these escapement goals. With the escapement goal range strategy, fishing opportunities are limited during years of weak runs and expanded during years of strong runs. Currently, escapement goal ranges together with real-time escapement enumeration (i.e., visual counts from towers, weir counts, aerial survey counts, sonar counts) and intensive fishery monitoring programs, have been established for most of Alaska's major salmon stocks.

²The FMP exempts three traditional net fisheries that extend from State waters into the EEZ. The State of Alaska manages these historical fisheries in Cook Inlet, near the mouth of the Copper River, and near False Pass. Appendix C of the Salmon FMP provides more details.

³ The Pacific Salmon Commission was established by the Pacific Salmon Treaty, signed in 1985 by the United States and Canada.

In certain fisheries, where it is not cost effective to manage for escapement goal ranges, either because the magnitude of the resource is low or it is difficult or impossible to enumerate escapement, fishing is limited to conservative weekly fishing periods. These fishing periods are set to provide liberal windows of time for salmon to move through the fishery, and reflect the level of fishing that has provided a sustainable level of catch based on the historical performance of the fishery. For these fisheries, fishing periods may be shortened or lengthened depending on qualitative indicators of run strength such as catch-per-unit-of-effort in directed or test fisheries. The fishing-period strategy is reviewed annually on the basis of postseason evaluations of escapement levels and fishery performance. The fishing-period strategy results in lower sustained yields than the escapement goal harvest strategy.

Historical nonterminal mixed-stock fisheries (e.g., South Peninsula June fishery, Lower Yukon River fisheries) are managed for preseason guideline harvest levels. These guideline harvest levels are set to ensure that exploitation rates in these nonterminal mixed-stock fisheries are low compared to the exploitation rates experienced by the stocks intercepted in their respective terminal harvest areas. This procedure insures that sufficient surplus fish are available in the terminal harvest area to meet escapement goals and provide for some level of harvest. The guideline harvest levels are reviewed every 2 years by the Board and are subject to reduction in situations of forecasted weak runs or declining runs. The Board has consistently acted to reduce historical nonterminal mixed-stock fisheries during periods of weak or declining runs and to eliminate or severely restrict new nonterminal mixed-stock fisheries whenever they developed.

TROLL VESSEL OBSERVER PROGRAM

The troll vessel observer program is conducted during the general summer troll fishery. The purpose of the program is to estimate the sex and maturity composition of the chinook and coho salmon catches, and the number of chinook salmon that are released. The coho salmon sex ratios and maturity data is used to evaluate methods for estimating run timing. In addition, the observers also collect coded-wire-tag and genetic samples from chinook for a pilot program that to determine stock origin.

1.2 Purpose of and Need for the Action

On October 11, 1996, the President signed into law the Sustainable Fisheries Act (Public Law 104-297). The Sustainable Fisheries Act made numerous amendments to the Magnuson Fishery Conservation and Management Act, resulting in what is now known as the Magnuson-Stevens Act. In particular, Section 108(a) of the Sustainable Fisheries Act amended Section 303(a) of the old Magnuson Act, resulting in Section 303(a) of the new Magnuson-Stevens Act. Section 303(a) describes required provisions of fishery management plans, including the following new requirement (paragraph (10)):

"Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery."

This language supersedes the requirement in the 1989 version of the national standard guidelines, which read,

"Each FMP must specify, to the maximum extent possible, an objective and measurable definition of overfishing for each stock or stock complex covered by that FMP, and provide an analysis of how the definition was determined and how it relates to reproductive potential."

In addition to replacing the above regulatory requirement with a new statutory requirement, the Sustainable Fisheries Act also instituted the following definition of "overfishing," a term which had previously lacked a statutory definition (paragraph (29) of Section 3):

"The terms 'overfishing' and 'overfished' mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis."

This language supersedes the definition in the 1989 version of the national standard guidelines, which read,

"'Overfishing' is a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis,"

where "MSY" denotes "maximum sustainable yield."

To aid in the development of overfishing definitions, NMFS created national standard guidelines that specify the status determination criteria to determine if the FMP fishery is overfished or if overfishing is occurring. The Magnuson-Stevens Act states that the guidelines "shall not have the force and effect of law," but simply "assist in the development of fishery management plans" (Section 301(b)). Furthermore, the preamble to the proposed rule for the guidelines states the following: "The proposed guidelines are intended to provide for reasonable accommodation of regional or individual fishery characteristics, provided that the requirements of the Magnuson-Stevens Act are met. The guidelines are intended as an aid to decision-making, with responsible conservation and management of valued national resources as the goal."

The advisory guidelines identify the following components as objective and measurable criteria for determining the status of the stock or stock complex to be defined in the FMP. The minimum stock size threshold (MSST) and maximum fishing mortality threshold (MFMT) are used to identify if a stock or stock complex is overfished. The MSST is the greater of: 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 stock or stock complex were exploited at the MFMT. If the actual size of the stock falls below MSST, the stock is considered "overfished." MFMT is expressed as the MSY fishing mortality rate. Exceeding the MFMT for a period of one year or more constitutes "overfishing."

1.3 Alternatives Considered

1.3.1 Alternative 1: Status Quo.

The FMP currently contains the overfishing definition implemented in 1990 under Amendment 4. At its September 1990 meeting, the Council considered Amendment 4 and received public testimony. It decided its preferred course of action for the salmon plan would be to request an exemption of the requirement for an overfishing definition. The Council concluded that the exemption would be appropriate because (1) the plan actively manages only the troll fisheries in the EEZ off Southeast Alaska, (2) those fisheries are covered by the policies of the State of Alaska and the Pacific Salmon Commission, (3) those policies are more conservative in preventing overfishing than those contained in the NOAA guidelines, and (4) under Amendment 3 of the plan, the Council deferred regulation of the salmon fisheries in the EEZ off Alaska to the State of Alaska. The Council requested the exemption in a letter of 9 October 1990 from Clarence Pautzke, Executive Director of the Council, to William Fox, Jr., NOAA Assistant Administrator for Fisheries.

On November 14, the Regional Director, NMFS Alaska Region, notified the Council's Executive Director that NOAA had denied the Council's request for an exemption. As a consequence of the rejection, the Council added the salmon overfishing definition to its agenda for a telephone conference call on November

15, 1990. During the conference call, the Council voted to adopt the definition proposed by the Scientific and Statistical Committee as the definition of overfishing for the salmon plan. The Scientific and Statistical Committee recommended that the Council adopt the policies and definitions of overfishing promulgated by the State of Alaska and the Pacific Salmon Commission as its definition of salmon overfishing.

The 1990 EA for Amendment 4 to the salmon FMP analyzed the alternative overfishing definitions and determined the overfishing policies of the State and PSC prevent overfishing and comply with the intent of national standard 1 in the Magnuson-Stevens Act. The salmon conservation policies adopted by the State of Alaska and the Pacific Salmon Commission ensure that Alaska's salmon fisheries are managed for sustained yield and to provide for the rebuilding of depressed stocks. These policies apply to all salmon catches off Alaska and within Alaskan waters except the "prohibited" catches made by the trawl fisheries in the Gulf of Alaska and Bering Sea.

1.3.2 Alternative 2: (Preferred)

Alternative 2 updates the FMP with new Magnuson-Stevens Act language and adopts the State overfishing policies as the FMP overfishing definitions. Since the last time the FMP was amended to define overfishing, the State has further refined its policy on sustained yield and rebuilding of depressed salmon stocks. These policies are included in the appendices. A salmon escapement goal policy was adopted by ADF&G in 1992. The policy was revised so that definitions were consistent with those in the Sustainable Salmon Fisheries Policy in 2000 (in appendix 5). The Board also adopted a policy for statewide salmon escapement goals in 2001 (in appendix 3). The policy states that establishment of salmon escapement goals is the responsibility of both the Board and ADF&G working collaboratively. The policy establishes the concepts, criteria and procedures for establishing and modifying escapement goals, a process that facilitates public review of allocative issues associated with these escapement goals. Also, the chinook harvest target level is now based on Chapter 3 of Annex IV of the Pacific Salmon Treaty as amended June 30, 1999, reproduced here as appendix 4.

The Council adopted a less explicit version of Alternative 2 in June 1998. The revised alternative contained in this document establishes the status determination criteria recommended in the national standard guidelines. The advisory guidelines provide a framework for determining the status of a stock to prevent overfishing and to provide for rebuilding if a stock is overfished, following the intent of national standard 1 in the Magnuson-Stevens Act. The status determination criteria detailed below were determined by analyzing the State's and the PST's salmon management policies. These criteria adhere to the national standard guidelines to the extent possible while providing for reasonable accommodation of regional and individual fishery characteristics.

Using the State of Alaska sustainable salmon fisheries policy and salmon escapement goal policy and the June 1999 Amendment to the Pacific Salmon Treaty, NMFS developed an MSY control rule, fishing mortality rate, maximum fishing mortality threshold (MFMT), and minimum stock size threshold (MSST) for the salmon stocks caught in the troll fishery in the SEAK EEZ. Chinook and coho are the primary target species, with pink, chum, and sockeye taken incidentally. These status determination criteria specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished or when overfishing is occurring.

The overfishing definitions separate the salmon stocks caught in the SEAK EEZ into three tiers. Tier 1 stocks are chinook stocks covered by the PST. The overfishing definition is based on a harvest based on a relationship between a pre-season relative abundance index generated by the Pacific Salmon Commission's Chinook Technical Committee and a harvest control rule specified in the PST. The PST also provides for an inseason adjustment to the harvest level based on an assessment of inseason data. In addition, decreases in the allowable catch are triggered by conservation concerns regarding specific stock groups. This

abundance-based system reduces the risk of overharvest at low stock abundance while allowing increases in harvest with increases in abundance, as with the management of the other salmon species in the southeast Alaska salmon fishery.

Tier 2 and tier 3 are salmon stocks managed by the Board and ADF&G. Tier 2 are coho salmon stocks. Tier 3 stocks are coho, pink, chum, and sockeye salmon stocks managed as mixed-species complexes, with coho salmon stocks as indicator stocks. Management of coho is based on aggregate abundance. Lack of a general coho stock identification technique prevents assessment of run strength of individual stock groups contributing to these early-season mixed stock fisheries. Information available on individual coho indicator stocks is considered in management actions. The southeast Alaska wild coho indicator stocks are Auke Creek coho, Berners River coho, Ford Arm Lake coho, and Hugh Smith Lake coho. The overfishing definitions for tier 2 and 3 are based on the State’s MSY escapement goal policies as described in appendix 3. The present policies and status determination criteria proposed in this amendment would prevent overfishing and provide for rebuilding of overfished stocks in the manner and timeframe required by the Magnuson-Stevens Act. All salmon fisheries are monitored by the State to assess the health of the stocks over time.

An MSY control rule, a MFMT, and a MSST are established for each tier. If a stock or stock complex is declared overfished or if overfishing is occurring, the Council will notify the State and request that the State conduct a formal assessment of the primary factors leading to the decline in abundance and report to the Council the management measures the State will implement for rebuilding the fishery. The Council will assess these rebuilding measures for compliance with the Magnuson-Stevens Act, including the national standard guidelines. The State rebuilding program may be adopted without an FMP amendment to assure timely implementation. On June 28, 2001, the AFCS certified, without reservations, that the subject overfishing definitions comply with the 50 CFR part 600 guidelines.

1.3.2.1. Proposed New Definitions

Tier 1: Chinook stocks

1) Under the PST, the MSY control rule consists of a segmented linear relationship between catch and relative abundance (Table 1 from PST, appendix 4). Each segment of the relationship is of the form:

$$Y_t = \alpha_{X_t} X_t + \beta_{X_t}$$

where t represents time (measured in years), Y_t represents the all-gear catch (measured in number of fish) in year t , X_t represents relative abundance in year t (as established by the Pacific Salmon Commission’s Chinook Technical Committee), and α and β represent coefficients whose values depend on X_t . The relationships between X_t , α , and β are as follow:

If X_t is greater than or equal to	and X_t is less than	then α is	and β is
0	0.05	0	0
0.05	1.00	130,000	20,000
1.00	1.25	285,000	-135,000
1.25	1.55	178,495	20,000
1.55	2.25	193,370	20,000

According to the PST, this control rule is “designed to contribute to the achievement of MSY or other agreed biologically-based escapement objectives.” The portion of the all-gear catch that is allocated to troll gear can be computed by subtracting 20,000 from Y_t (to exclude the fixed amount allocated to net gear) and multiplying the result by 0.8 (to exclude the 20% allocated to the sport fishery).

The PST identifies one or more “indicator” stocks for each of the eight stock groups that comprise the SEAK chinook fishery. The PST also requires the Chinook Technical Committee to establish biologically-based “escapement goal ranges” for each group’s indicator stocks, either individually or in aggregate. If more than one group’s indicator stocks exhibit escapements below the lower bound of the escapement goal range for two consecutive years, the PST provides for a specific reduction in the α parameter used in the MSY control rule, subject to various qualifications. The required reduction in α varies with the number of stock groups exhibiting back-to-back escapement failures, as shown in the following table:

<u>Number of stock groups requiring response</u>	<u>Percentage reduction in α</u>
2 stock groups	10%
3 stock groups	20%
4+ stock groups	30%

2) The fishing mortality rate (F) for these stocks is expressed as cumulative catch per generation time:

$$F_t = \sum_{i=t-T_{chin}+1}^t C_i$$

where C_t represents the all-gear catch taken in year t and T_{chin} represents the average chinook lifespan that would be expected over the long term in the absence of exploitation. The default value of T_{chin} is five years, but the Scientific and Statistical Committee may set T_{chin} at another value, without a plan amendment, on the basis of the best scientific information available. It may be noted that the above definition of fishing mortality rate is somewhat different from that commonly used for many other species, for example those managed under the BSAI and GOA groundfish FMPs. The reason for the difference is as twofold. First, for groundfish species, the fishery in any given year has access to the entire stock, whereas for salmon species, the fishery in any given year has access only to the portion of the stock returning in that year. Second, the above definition conforms more closely to the PST.

3) The maximum fishing mortality threshold is computed as follows:

$$MFMT_t = 1.075 \times \sum_{i=t-T_{chin}+1}^t Y_i$$

(again, Y_t represents the all-gear catch associated with the MSY control rule in year t ; it may or may not equal C_t , the catch that was *actually taken* in year t). The 7.5% overage allowance is a current feature of the FMP and is prescribed by the PST (Annex IV, Chapter 3, Paragraph 7).

4) Should the fishing mortality rate exceed the MFMT in any year, it will be determined that the stocks are being subjected to overfishing.

5) The productive capacity of a stock group is measured as the sum of the indicator stocks' escapements from the most recent T_{chin} years.

6) The minimum stock size threshold for a stock group is equal to one-half the sum of the indicator stocks' MSY escapement goals from the most recent T_{chin} years, where each MSY escapement goal is set at the midpoint of the respective escapement goal range established by the Chinook Technical Committee.

7) Should a stock group's productive capacity fall below the MSST in any year, it will be determined that the stock group is overfished.

Tier 2: Coho stocks managed as individual units

1) The MSY control rule is of the "constant escapement" form. Specifically, the catch corresponding to the control rule in any given year is equal to the amount that would result in a post-harvest run size equal to the MSY escapement goal, unless the pre-harvest run size fails to exceed the MSY escapement goal, in which case the catch corresponding to the control rule is zero:

$$Y_t = \max(0, R_t - G_t)$$

where R_t is pre-harvest run size in year t and G_t is the MSY escapement goal in year t . The MSY escapement goal is normally constant across years, but may vary due to changes in environmental conditions. It is specified so that the long-term average catch expected under this strategy is maximized. In cases where the State's "biological escapement goal" consists of a range, the MSY escapement goal corresponds to the lower endpoint of that range. In cases where the State's "biological escapement goal" consists of a single point, the MSY escapement goal corresponds to that point.

2) The fishing mortality rate for these stocks is expressed as an exploitation rate, and is computed as a weighted average of recent run-specific exploitation rates observed in the stock:

$$F_t = \frac{\sum_{i=t-T_{cho}+1}^t C_i}{\sum_{i=t-T_{cho}+1}^t R_i}$$

where T_{cho} represents the average coho lifespan that would be expected over the long term in the absence of exploitation. The default value of T_{cho} is four years, but the Scientific and Statistical Committee may set T_{cho} at another value, without a plan amendment, on the basis of the best scientific information available.

3) The maximum fishing mortality threshold for these stocks is computed as a weighted average of recent run-specific exploitation rates corresponding to the MSY control rule:

$$MFMT_t = \frac{\sum_{i=t-T_{cho}+1}^t Y_i}{\sum_{i=t-T_{cho}+1}^t R_i}$$

- 4) Should the fishing mortality rate exceed the MFMT in any year, it will be determined that the stock is being subjected to overfishing.
- 5) The productive capacity of a stock is measured as the sum of the stock's escapements from the most recent T_{coho} years.
- 6) The minimum stock size threshold for a stock is equal to one-half the sum of the stock's MSY escapement goals from the most recent T_{coho} years.
- 7) Should a stock's productive capacity fall below the MSST in any year, it will be determined that the stock is overfished.

Tier 3: Coho, sockeye, pink, and chum salmon stocks managed as complexes

- 1) The MSY control rule is of the "constant escapement" form. The difference with respect to Tier 2 is not the *form* of the control rule, but rather the level of aggregation at which it is applied.
- 2) Whenever estimates of F or MFMT, as defined under Tier 2, are unavailable for each stock in a stock complex managed under this FMP, a list of "indicator" coho stocks will be established by ADF&G.
- 3) Using the same definitions and criteria described under Tier 2, a determination that one or more indicator coho stocks is being subjected to overfishing will constitute a determination that the respective stock complex is being subjected to overfishing, except as provided in the paragraph below.
- 4) Overfishing of one or more stocks in a stock complex may be permitted, and will not result in a determination that the entire stock complex is being subjected to overfishing, under the following conditions (50 CFR §600.310(d)(6)):
 - a) it is demonstrated by analysis that such action will result in long-term net benefits to the Nation;
 - b) it is demonstrated by analysis that mitigating measures have been considered and that a similar level of long-term net benefits cannot be achieved by modifying fleet behavior, gear selection/configuration, or other technical characteristic in a manner such that no overfishing would occur; and
 - c) the resulting rate or level of fishing mortality will not cause any species or evolutionarily significant unit thereof to require protection under the ESA.

In the absence of significant evidence to the contrary, satisfaction of the above conditions will be considered equivalent to the State's establishment of an "optimal escapement goal" lower than the "biological escapement goal" for the same stock.

- 5) The productive capacity of a stock complex is measured as the sum of the indicator coho stocks' escapements from the most recent T_{coho} years.
- 6) The MSST for a stock complex is equal to one-half the sum of the indicator coho stocks' MSY escapement goals from the most recent T_{coho} years.
- 7) Should a stock complex's productive capacity fall below the MSST in any year, it will be determined that the stock complex is overfished.

1.4 Alternatives Considered And Rejected

A number of approaches were considered for defining overfishing for the fishery management plan. For a definition to be meaningful, it must be usable by fishery managers during the fishing season. For example, attempting to define overfishing in terms of exploitation rates (U) or instantaneous rates of fishing mortality (F) was not attempted because information on these factors is unknown during the fishing season and can only be estimated for a few stocks late after the fishery has ended for the year. The team rejected optimum spawning escapement goals for similar reasons. The following paragraphs describe three approaches for defining overfishing the team examined in some detail and discusses why the team rejected them as inappropriate or unworkable alternatives. The primary reason these alternatives were rejected is that they would not result in definitions that comply with the national standard guidelines, the Pacific Salmon Treaty, or current State management, and thus they are not in the scope of reasonable alternatives.

Minimum Spawning Escapement Goals

Establishing minimum spawning stock size thresholds for a salmon stock is similar to establishing an absolute minimum escapement goal. Managers of salmon fisheries generally strive to achieve a much larger spawning escapement than some minimum number that barely prevents the stock from going to extinction or losing genetic variability. They strive to obtain the optimum number of effective spawners, i.e., the number of spawners that will maintain the stock at its maximum level of production (harvest plus spawning).

For most of the salmon stocks found in the EEZ off the coast of Alaska, minimum spawning levels are unknown, but they are far below levels managed for or considered desirable. In addition, two factors render such an approach unworkable: (a) the difficulty of identifying which specific stocks are being harvested combined with (b) the fact that salmon fisheries usually harvest salmon stocks from several days to several weeks before those stocks reach the spawning grounds. Furthermore, managers rarely have precise counts of how many salmon of each stock reached the spawning ground. In conclusion, the alternative of defining overfishing in terms of minimum spawning escapement goals is not practicable.

Optimum Spawning Escapement Goals

Optimum spawning escapement goals are based on such factors as estimates of spawning or rearing habitat or historical production by a stock from a range of observed spawning escapements. Optimum spawning escapement goals are generally expressed in numbers of adult fish or as an escapement rate, often with a numerical floor or threshold. Because optimum spawning escapement goals tend to reflect estimates of maximum sustainable yield for a stock, they provide a good quantifiable measure for judging whether a stock is overfished.

Under this alternative, the fishery would be managed to ensure that the optimum spawning escapement goals were met. Optimum spawning escapement goals have been established for only a few of the thousands of salmon stocks found in the EEZ off the coast of Alaska. Moreover, even if optimum spawning escapement goals were established, it would be impossible to manage the salmon fisheries off the coast of Alaska on that basis alone for the same reasons managers are unable to regulate fisheries on the basis of minimum spawning escapement goals.

Control the Exploitation Rate

Under this alternative, fishery managers would control the salmon fisheries so that the exploitation rate would not exceed a maximum level.

This alternative faces the same problems as the aforementioned approaches. Because of (1) the large number of stocks mixed together in the EEZ off Alaska, (2) the large number of stocks harvested in the multitude of fisheries from Alaska to Oregon, and (3) the general inability to distinguish specific stocks when they are away from their spawning grounds (few are marked with coded-wire tags or recognizable natural marks), it

is, generally, impossible to calculate exploitation rates for individual salmon stocks, especially during the fishing season. Thus, it is impossible to manage salmon fisheries on the basis of exploitation rates for specific stocks and control those rates of exploitation.

Furthermore, even if it were possible to control the exploitation rate on one or more stocks during a fishing season, for the rest of the stocks in the mixed-stock fishery, the overall exploitation rate would be too low on some of the stocks and too high on others.

1.5 Recreational Fisheries

The salmon FMP allows recreational fishing for salmon in the EEZ off the coast of Alaska. The FMP defers management of the recreational salmon fishery in the EEZ to the State to manage along with the recreational fishery inside State waters. State sports fishing regulations are at 5AAC 47, 5AAC 75, and 5 AAC 77. The majority of recreational fishing for salmon takes place in State waters. ADF&G Division of Sport Fish is responsible for the state's recreational fishery resource: the conservation of self-perpetuating populations of fish; management of sport fisheries in both salt and fresh water; and hatchery production and release of fish for sport fishing. The goals of the division are: conserve naturally reproducing populations of sport fish species, provide a diverse mix of sport fishing opportunities, and, optimize the social and economic benefits of Alaska's recreational fisheries. Several fundamental tasks are associated with these goals. The priority for research staff is to monitor populations of naturally reproducing sport fishes. In general, this involves determining how many fish are present in a population, if that population is stable, the level of harvest presently affecting the population, and the impacts to the environment and the subsequent population of recreational fisheries upon that population.

The impacts of this amendment on the recreational fisheries were considered, and it was determined that the revised overfishing definitions would not have measurable impacts on the recreational salmon fisheries. In the event the fishery is determined overfished or overfishing is occurring, the impacts of rebuilding measures on recreational fisheries will need to be addressed.

1.6 Fishing Communities

Section 303(a)(9) of the Magnuson-Stevens Act requires that each FMP include in the fishery impact statement an assessment, specification, and description of the likely effects of the measures on the fishing communities. The FMP was last revised in 1990 and does not specifically address fishing communities and potential impacts on such communities. However, the Council and the State of Alaska have conducted analyses to determine the impacts of fishing and the role fishing plays in the communities of southeast Alaska. "Faces of the Fisheries: Southeast Alaska" (Council 1994), provides a description of the communities of southeast Alaska and the fisheries activities of each community. ADF&G Commercial Fisheries Management and Development Division has completed a draft for technical review entitled "Economic Impact Analysis of the Seafood Industry in Southeast Alaska: Importance, Personal Income and Employment in 1994" (Hartman 1998).

No rules are associated with Amendment 6 to the salmon FMP and no immediate socioeconomic impacts are anticipated from the status quo or proposed action, therefore no further description of fishing communities is required for these amendments. In the event the fishery is determined overfished or overfishing is occurring, the impacts of rebuilding measures on fishing communities will need to be addressed.

2.0 ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in significant impact on the human environment. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact statement (EIS) must be prepared for major Federal actions significantly affecting the human environment.

The environmental impacts generally associated with fishery management actions are effects resulting from (1) harvest of fish stocks which may result in changes in food availability to predators and scavengers, changes in the population structure of target fish stocks, and changes in the marine ecosystem community structure; (2) changes in the physical and biological structure of the marine environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and (3) entanglement/entrapment of non-target organisms in active or inactive fishing gear.

The status quo alternative would not provide status determination criteria as required by the Magnuson-Stevens Act and national standard guidelines. Therefore, while not detrimental to salmon stocks, status quo will not provide the mechanisms for determining if a stock is overfished or if overfishing is occurring. And, thus it would not provide the mechanisms for determining when to rebuild overfished stocks.

The status determination criteria proposed in the preferred alternative for this amendment are for conservation purposes, to establish benchmarks from which State and Federal managers can determine if a stock is overfished or if overfishing is occurring. The proposed status determination criteria will enable the Council and NMFS to monitor the salmon stocks under the FMP and determine whether overfishing is occurring or whether these stocks are overfished. If stocks fail to meet these benchmarks, conservation measures are enacted to rebuild the stocks back to healthy populations. Rebuilding measures include closing the directed fishery, reducing harvest and bycatch, and habitat protection. Thus, the preferred alternative improves salmon management in the EEZ off the coast of Alaska by improving the ability to determine the status of the resource.

Salmon management in the waters off Alaska is complicated due to the complex anadromous life history and transboundary migration of salmon. A number of factors have contributed to the current high abundance of Alaska salmon. These include: 1) pristine habitats with minimal impacts from extensive development; 2) favorable ocean conditions that allow high survival of juveniles; 3) improved management of the fisheries by State and Federal agencies; 4) elimination of high-seas drift-net fisheries by foreign nations; 5) hatchery production; and 6) reduction of bycatch in fisheries for other species. Unspoiled habitats, favorable oceanic conditions, and adequate numbers of spawning salmon are likely the paramount issues affecting current Alaska salmon abundance. Alaska salmon management continues to focus on maintaining pristine habitats and ensuring adequate escapements. Ocean conditions, however, that have favored high marine survivals in recent years, fluctuate due to interdecadal climate oscillations (Mantua et al. 1997).

The State of Alaska manages salmon stocks according to the best scientific information available to achieve sustainable yield. Salmon are targeted throughout their adult life by a variety of fisheries from mixed stock troll fisheries to terminal net fisheries. The State of Alaska manages salmon holistically by incorporating all the sources of fishing mortality on a particular stock or stock complex in calculating the escapement goal range. As explained above, overfishing is prevented by inseason monitoring and data collection that indicates when an escapement goal is not being met. When the data indicated low run strength due to natural fluctuations in salmon abundance, ADF&G closes the fishery to ensure the escapement goal range is reached. This may result in low catches for the target fisheries, but it prevents overfishing and ensure sustained yield over the long term. The State monitors catch in all of the salmon fisheries.

NMFS has analyzed State salmon management with regards to overfishing a number of times. The status quo definition of overfishing was deemed adequate for Amendment 4 in 1990, because the policies of the Board and the Pacific Salmon Commission were more conservative than those required by NOAA's 602 guidelines, and hence served as an adequate definition of overfishing. On September 30, 1997, NMFS reported that none of fishery resources off Alaska, including salmon, were overfished. NMFS noted that "the overfishing definition for Pacific salmon is defined as any fishing that results in the stock not meeting spawner escapement targets. Escapement targets are set by ADF&G and the U.S.-Canada Pacific Salmon Commission so that escapement will not be significantly less than needed to produce MSY. Escapement targets for major stocks of Alaska salmon are continuously evaluated based on new data and improved spawner-recruit databases. The overfishing definition notwithstanding, it is recognized that failure to meet spawner escapements may also be the result of nonfishing mortality and that fishery management actions may not adequately address the situation."

Furthermore, the 1997 EA to evaluate federal deferral of salmon management to the State provides a detailed analysis of State management and concludes that State management has resulted in healthy salmon stocks for all species. The overfishing definitions proposed by this amendment translates the overfishing policies of the State of Alaska into the framework of the national standard guidelines, to enable NMFS to determine the whether or not salmon stock targeted by FMP fisheries are overfished or overfishing is occurring. The overfishing policies of the State prevent overfishing and provide for rebuilding of a stock or stock complex if it is determined to be overfished.

2.1 Impacts on Endangered or Threatened Species

The Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq*; ESA), provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by the NMFS for most marine mammal species, marine and anadromous fish species, and marine plants species and by the USFWS for bird species, and terrestrial and freshwater wildlife and plant species.

The designation of an ESA listed species is based on the biological health of that species. The status determination is either threatened or endangered. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)]. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine fish, plants, and mammals (except for walrus and sea otter) and anadromous fish species. The Secretary of the Interior, acting through the USFWS, is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife, and freshwater fish and plant species.

In addition to listing species under the ESA, the critical habitat of a newly listed species must be designated concurrent with its listing to the "maximum extent prudent and determinable" [16 U.S.C. § 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. Federal agencies are prohibited from undertaking actions that destroy or adversely modify designated critical habitat. Some species, primarily the cetaceans, which were listed in 1969 under the Endangered Species Conservation Act and carried forward as endangered under the ESA, have not received critical habitat designations.

Listed Species. The following species are currently listed as endangered or threatened under the ESA and occur, or may occur, in the subject marine waters of the EEZ off southeast Alaska:

Endangered

Humpback whale

Megaptera novaeangliae

Snake River Sockeye salmon	<i>Oncorhynchus nerka</i>
Short-tailed albatross	<i>Diomedea albatrus</i>
Upper Columbia River Spring Chinook	<i>Oncorhynchus tshawytscha</i>
Upper Columbia River Spring Steelhead	<i>Oncorhynchus mykiss</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>

Threatened

Steller sea lion (eastern population)	<i>Eumetopias jubatus</i>
Snake River spring/summer chinook salmon	<i>Oncorhynchus tshawytscha</i>
Snake River fall Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Puget Sound Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Lower Columbia River Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Upper Willamette River Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Upper Columbia River Spring Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Snake River Basin Steelhead	<i>Oncorhynchus mykiss</i>
Lower Columbia River Steelhead	<i>Oncorhynchus mykiss</i>
Upper Willamette River Steelhead	<i>Oncorhynchus mykiss</i>
Middle Columbia River Steelhead	<i>Oncorhynchus mykiss</i>

Because amending the salmon FMP is a Federal action, any negative affects of the fishery promulgated by the FMP on listed species or critical habitat and any takings⁴ that may occur are subject to ESA section 7 consultation. NMFS initiates the consultation and the resulting biological opinions are issued to NMFS. The Council may be invited to participate in the compilation, review, and analysis of data used in the consultations. The determination of whether the action "is likely to jeopardize the continued existence of" endangered or threatened species or to result in the destruction or modification of critical habitat, however, is the responsibility of the appropriate agency (NMFS-Protected Resources Division or FWS). If the action is determined to result in jeopardy, the opinion includes reasonable and prudent measures that are necessary to alter the action so that jeopardy is avoided. If an incidental take of a listed species is expected to occur under normal promulgation of the action, an incidental take statement is appended to the biological opinion.

Section 7 consultations have been done for all the above listed species, some individually and some as groups. Below are summaries of the consultations.

Marine Mammals

With regard to ESA listed marine mammals, the fishery harvests salmon which are not among the primary prey species of Steller sea lion and humpback whale and, therefore, do not compete with these mammals for the salmon. The harvested fish are taken late in the salmon's lifecycle and, therefore, are beyond the size of prey suitable for foraging marine mammals. The vessels used in the fishery, and operators thereof, have occasional interactions with Steller sea lion and humpback whale; however, any possible adversely effects on the species is minimized. Interactions are largely mitigated through NMFS sponsored education programs sensitizing harvesters to marine mammal protection laws and providing approach and watching guidance. NMFS determined this action will no effect listed marine mammals.

Humpback Whales. Humpback whales were initially listed in 1969 with the Endangered Species Conservation Act, and maintained in the status of endangered when the Endangered Species Act passed into

⁴ the term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct" (16 U.S.C. § 1538(a)(1)(B)).

law in 1973. No critical habitat has been designated. A Recovery Plan for Humpback whales has been adopted (NMFS 1991). The historic summering range in the North Pacific encompasses coastal and inland waters around the Pacific rim from Point Conception, California, north to the Gulf of Alaska and the Bering Sea, and west along the Aleutian Islands to the Kamchatka Peninsula and into the Sea of Okhotsk (Tomlin 1967; Nemoto 1957; Johnson and Wolman 1984). The humpback whale population in much of this range was considerably reduced as a result of intensive commercial exploitation during this century. Four stocks are recognized in the North Pacific: the two that come to Alaska are the Central North Pacific, and the Western North Pacific. No reliable abundance estimate or information on trends in abundance exists for the Western North Pacific stock (Hill et al. 1996). The Central North Pacific stock is more well known in terms of feeding aggregations in Prince William Sound and southeastern Alaska (Baker et al. 1986). Baker and Herman (1987) estimated the stock at 1,407 animals between 1980-1983. The robustness of that estimate is questionable, however, due to opportunistic nature of the survey methodology in conjunction with a small sample size. A current abundance estimate is considered unknown though the stock is believed to have increased since those data were collected (DeMaster 1995).

NMFS has determined that for humpback whale, the mortality and serious injury incidental to commercial fishing operations will have a negligible impact (60 FR 45399; August 31, 1995). A 'negligible impact' is defined as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through an effect on annual rates of recruitment or survival. Section 7 consultation was completed on this determination (NMFS 1995a) including issuance of an incidental take statement for humpback whales for commercial fishing operations of an average annual incidental mortality and serious injury in commercial fishery of up to 2.8 humpback whales from the Central North Pacific stock. This fishery is not known to interact with humpback whales. And, the preferred overfishing definitions will have no effect on humpback whales.

Steller sea lion. The Steller sea lion range extends from California and associated waters to Alaska, including the Gulf of Alaska and Aleutian Islands, and into the Bering Sea and North Pacific and into Russian waters and territory. In 1997, based on biological information collected since the species was listed as threatened in 1990 (60 FR 51968), NMFS reclassified Steller sea lions as two distinct population segments under the ESA (62 FR 24345). The Steller sea lion population segment west of 144°W longitude (a line near Cape Suckling, Alaska) is listed as endangered; the remainder of the U.S. Steller sea lion population maintains the threatened listing.

NMFS designated critical habitat in 1993 (58 FR 45278) for the Steller sea lion based on the Recovery Team's determination of habitat sites essential to reproduction, rest, refuge, and feeding. Listed critical habitats in Alaska include all rookeries, major haul-outs, and specific aquatic foraging habitats of the BSAI and GOA. The designation does not place any additional restrictions on human activities within designated areas. No changes in critical habitat designation were made as result of the 1997 re-listing.

The most recent detailed review of Steller sea lion population status in Alaska is contained in the Section 7 Biological Opinion and Incidental Take Statement (2001 Biop), including recent survey data used to monitor population status (NMFS 2001). The opinion describes the continuing decline of the western Steller sea lion population and concluded that the FMPs for the Groundfish fisheries in the BSAI and the GOA were likely to jeopardize the continued existence of the western population of Steller sea lions.

The salmon troll fishery occurs only in the eastern portion of the Gulf of Alaska, in the range of the eastern population of Steller Sea lions. This fishery is not known to interact with Steller Sea lions. And, the preferred overfishing definitions will have no effect on Steller Sea lions.

Pacific Salmon. No species of Pacific salmon originating from freshwater habitat in Alaska are listed under the ESA. West coast salmon species currently listed under the ESA originate in freshwater habitat in

Washington, Oregon, Idaho, and California. The listed salmon are presumed to range into marine waters off Alaska during ocean migration and growth to maturity phases of their anadromous life history. During ocean migration to the Pacific marine waters a small (undetermined) portion of the stock go into the Gulf of Alaska as far east as the Aleutian Islands. In that habitat they are mixed with hundreds to thousands of other stocks originating from the Columbia River, British Columbia, Alaska, and Asia. The listed fish are not visually distinguishable from the other, unlisted, stocks. Mortal take of them in the high seas troll fishery occurs.

ESA listed west coast salmon are categorized by Evolutionary Significant Unit (ESU). An ESU is a distinct population segment that is reproductively isolated and contributes to the ecological or genetic diversity of the species (Waples 1991). To date, nine ESUs of chinook salmon, two ESUs of chum salmon, three ESUs of coho salmon, two ESUs of sockeye salmon, nine ESUs of steelhead, and one ESU of sea-run cutthroat trout have been listed as either threatened or endangered under the ESA. Of those listed, only six ESUs of chinook salmon, one ESU of sockeye salmon, and five ESUs of steelhead are thought to range into marine waters off Alaska during the ocean portion of their life history.

NMFS designated critical habitat in 1993 (57 FR 57051) for the for the Snake River sockeye, Snake River spring/summer chinook, and Snake River fall chinook salmon. NMFS designated critical habitat in 2000 (65 FR 7764) for Puget Sound, Lower Columbia River, Upper Willamette River, and Upper Columbia River Spring chinook salmon and Upper Columbia River, Snake River Basin, Lower Columbia River, Upper Willamette River and Middle Columbia River steelhead. These designations did not include any marine waters; therefore, none of the habitat where the Alaska salmon fishery occurs is designated as critical.

In 1999, NMFS issued a biological opinion on approval of the Pacific Salmon Treaty by the U.S. Department of State and management of the Southeast Alaska salmon fisheries subject to the Pacific Salmon Treaty (NMFS 1999). The biological opinion concluded that the Pacific Salmon Treaty and the decision by the Council to continue to defer its management authority to the State of Alaska is not likely to jeopardize any of the sixteen threatened or endangered ESUs of Pacific salmon, steelhead, or cutthroat trout or destroy or adversely modify any of the critical habitat that has been designated for these species. The biological opinion contains an incidental take statement that prescribes reasonable and prudent measures that must be undertaken. These measures are necessary to minimize and reduce the anticipated level of incidental take of listed species. The biological opinion also details terms and conditions and conservation recommendations for NMFS and the State of Alaska.

In addition, NMFS prepared an environmental assessment on continuing the deferral of regulations to ADF&G for the Salmon Fisheries in the EEZ and State Waters off the Coast of Alaska (NMFS 1997a). Impacts of the troll fishery to listed salmon are fully explained in the 1997-2003 biological assessment (Sands and Koenings 1997). As previously determined by NMFS, the southeast Alaska salmon fishery does not jeopardize the continued existence of ESA listed Pacific salmon.

Prior to the 1999 Biological Opinion, NMFS had, through the Section 7 consultation process, determined that the southeast Alaska salmon troll fishery does not jeopardize the continued existence of the Snake River fall chinook or result in the destruction or adverse modification of critical habitat. NMFS has issued six biological opinions, including no-jeopardy determinations and incidental take statements for listed Pacific salmon (NMFS 1993; 1994; 1995d; 1996; 1997b; 1998). Each biological opinion contained one-year expiration dates, except the 1998 opinion lasted while the Letter of Agreement between ADF&G and the Pacific Salmon Commission was in effect (Attachment 1 to NMFS 1997a). Conservation measure contained in these past opinions varied somewhat, but generally were recommendations related to limiting chinook harvest in the commercial all-gear fishery consistent with US/Canada treaty negotiations.

Amendment 6 to the FMP provides criteria for assessing the status of stocks relative to overfishing, but does not otherwise change the current management regime. Therefore, it is not likely to adversely affect listed

salmonid species or affect critical habitat. Further, the Amendment will have no effect on the actions that were previously considered in NMFS's 1999 biological opinion. The State will continue to manage the fisheries subject to the FMP and the terms of the 1999 PST Agreement, and NMFS and the NPFMC will continue to defer management to the State subject to on-going review of state actions for consistency with applicable law.

NMFS Alaska Region determined that this amendment is not likely to adversely affect the salmon species currently listed as endangered or threatened under the Endangered Species Act (ESA) and which may occur in the Gulf of Alaska, or destroy or adversely modify their critical habitat. Thus, a formal section 7 consultation does not need to be reinitiated under 50 CFR 402.16. Based on this determination, NMFS Alaska Region conducted an informal consultation with NMFS Northwest Region (NMFS 2001a). NMFS Northwest Region concurred with this determination (NMFS 2001b).

American Peregrine Falcon. American peregrine falcons may occur in the management area, particularly near shore, as a transient, primarily during seasonal migration based on advice from the Fish and Wildlife Service (in a letter from Lindell, FWS, to Zimmerman, NMFS, March 28, 1997). The existing information suggests that the SEAK troll fishery does not have an effect on the population of American peregrine because the fishery occurs in the EEZ, which is three miles from shore. The fishery has no effect on the American peregrine falcon; therefore, no formal or informal Section 7 consultation is underway. NMFS determined the preferred overfishing definitions will have no effect on American Peregrine falcons.

Seabirds. Impacts on seabirds from the salmon fishery are minimal, if any. The salmon harvested in the fishery are mature, fully grown salmon, not the size range of forage fish utilized by seabird populations. No listed seabirds are known to occur in the action area. Thus, no effects by the fishery have been identified. Likewise, seabirds are not known to become entangled in the gear used in this fishery. The preferred overfishing definitions will have no effect on listed seabirds.

Leatherback sea turtle. The endangered species of Leatherback sea turtle (*Dermochelys coriacea*) may occur in the waters off Alaska. Critical habitat has not been designated in Alaska for the Leatherback sea turtle. The existing information suggests that the SEAK troll fishery does not have an effect on the population of Leatherback sea turtles. The SEAK troll fishery, as prosecuted, does not take as bycatch Leatherback sea turtles. No reports have been made of gear or vessel interactions with this listed species. The preferred overfishing definitions will have no effect on leatherback sea turtles.

2.2 Marine Mammal Protection Act Considerations

The Alaska troll fishery is classified as a category III fishery under the Marine Mammal Protection Act. A fishery that interacts only with non-strategic stocks and whose level of take has an insignificant impact on the stocks is placed in category III. Marine mammals not listed under the ESA that may be present in the southeast EEZ include cetaceans, [minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), Dall's porpoise (*Phocoenoides dalli*), harbor porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and the beaked whales (e.g., *Berardius bairdii* and *Mesoplodon spp.*)] as well as pinnipeds [northern fur seals (*Callorhinus ursinus*), and Pacific harbor seals (*Phoca vitulina*)] and the sea otter (*Enhydra lutris*).

None of the alternatives would affect takes of marine mammals. Therefore, none of the alternatives are expected to have a significant impact on marine mammals.

2.3 Coastal Zone Management Act

Implementation of each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of Section 30(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.4 Impacts on Essential Fish Habitat

Section 303(a)(7) of the Magnuson-Stevens Act requires all FMPs to describe and identify EFH, which it defines as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.” In addition, FMPs must minimize effects on EFH caused by fishing and identify other actions to conserve and enhance EFH. These EFH requirements are detailed in Amendment 5 to the salmon FMP and the accompanying Environmental Assessment (available from NMFS).

The FMP for the salmon fisheries allows commercial trolling in the SEAK EEZ, and closes the remaining federal waters in central and western Alaska to commercial salmon fishing.⁵ All other salmon fishing occurs in Alaska waters. The SEAK troll fishery is a mixed-stock, mixed species fishery that primarily targets chinook and coho salmon, with other salmon species taken incidentally. The troll fishery operates in both State and Federal waters, although, the majority of the catch and effort occurs in the State waters. The State collects fisheries information from the troll fishery as a whole and does not separate the fishery in the EEZ from the State fishery. The SEAK EEZ troll catch represents approximately 6% of the total chinook and coho landed by salmon fisheries in southeast Alaska (1991-1996 average). The troll fishery has two seasons, the winter season, October 11 - April 14, and the summer season, April 15-September 30. The winter troll fishery is limited to within State waters.

No evidence suggests salmon troll gear impacts habitat. The activity targets only adult salmon in the water column, successfully avoiding any significant disturbance of the benthos, substrate, or intertidal habitat. The SEAK troll fishery does not occur on any areas designated as Habitat Areas of Particular Concern (HAPC). The action proposed by this amendment will not increase the amount of harvest, the intensity of harvest, or the location of harvest, therefore, this action is presumed not to increase the impacts of the fishery to EFH.

2.5 Socioeconomic Impacts

The socioeconomic impacts of this proposed action on direct users and indirect users are negligible because this amendment provides status determination criteria for determining the status of the salmon resources. Existing State management establishes the harvest rate and would close the salmon fisheries before the status determination criteria are exceeded. Thus, this action just provides a safeguard against overfishing and provides for NMFS and Council monitoring of the status of the salmon stocks under the FMP. However, if State management remains conservative, these proposed overfishing definitions will not result in the fisheries closures.

⁵The FMP exempts three traditional net fisheries that extend from State waters into the EEZ. The State of Alaska manages these historical fisheries in Cook Inlet, near the mouth of the Copper River, and near False Pass. Appendix C of the Salmon FMP provides more details.

2.6 Conclusions or Finding of No Significant Impact

The overfishing definitions are not expected to change the conservative nature of salmon fishery management or how the fishery is prosecuted. This action will not change the amount of salmon harvested, the method of harvest, the fishing season, or where the fishery is located. The context of the action is the EEZ off Alaska, the SEAK EEZ, and the area where the fishery is prosecuted. In determining the significance of this action, the following provides an analysis of the intensity of the direct, indirect, and cumulative impacts using the criteria in the Council on Environmental Quality regulations at 50 C.F.R. section 1508.27. The intensity of the impacts is minimal because the fishery is likely to be managed the same way under these overfishing definitions as it was before. The action does not affect public health or safety and no unique characteristics of the geographical area will be affected. The effects on the quality of the human environment are non-controversial and a relatively high degree of certainty exists in determining the effects on the human environment. This action does not establish a precedent for future actions. This action is not related to other actions that cumulatively would have significant impacts. This action will not adversely affect endangered or threatened species or their habitat, as discussed in the subsequent section. This action does not threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. Therefore, direct, indirect, and cumulative impacts of this action on the human environment are not expected to be significant. The magnitude of the impacts of this action will be an improvement in NMFS' and the Council's ability to determine the status of the salmon stocks caught in the fishery authorized under the FMP.

In view of the analysis presented in this document, I have determined that the proposed salmon overfishing definitions would not significantly affect the quality of the human environment. Based on this determination, the preparation of an environmental impact statement for the proposed action is not required by section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

Assistant Administrator for Fisheries, NOAA

Date

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4.0 AGENCIES AND INDIVIDUALS CONSULTED

Doug Eggers, Norma Jean Sands, Earl Krygier
ADF&G, Juneau, AK

Peter Dygart
NMFS Northwest Fisheries Science Center

Sue Salvesson, Jay Ginter, Tamra Faris
NMFS, Juneau, AK

NPFMC Scientific and Statistical Committee
NPFMC Advisory Pane

John Coon
PFMC, Portland, OR

5.0 LIST OF PREPARERS

Grant Thompson
Alaska Fisheries Science
Center
Seattle, WA

Gretchen Harrington
NMFS
Juneau, AK

Dave Witherell
NPFMC
Anchorage, AK

Appendix 1 Summary of the State of Alaska Fishery Regulation Process

The directed salmon fishery in southeast Alaska, including the portions that occur in the EEZ, is regulated by State processes and is managed by the Alaska Department of Fish and Game (ADF&G). The Alaska State constitution requires that the State manage the fishery resource for sustainable yield. Regulations for the Alaska salmon fishery are made by the Alaska Board of Fisheries in abidance with State and Federal laws and with negotiated agreements within the Pacific Salmon Commission (PSC). ADF&G manages the fishery inseason and issues emergency regulations to achieve conservation objectives and to implement allocation policies established by the Alaska Board of Fisheries (Board)

The Alaska Board of Fisheries

The Board holds public hearings on proposed management measures, establishes fishing seasons, and allocates harvest among gear and other fishing groups. Each year, the Board solicits proposed changes to the regulations governing various aspects of Alaska's fisheries. The Board considers salmon fishery management plans for the southeast Alaska region on a three-year rotational basis. The board distributes these proposals to the public for review and comment and then conducts open public meetings to evaluate and take action on the proposals. The fishing community has come to rely on this regularly scheduled participatory process as the basis for changing Alaska's fishing regulations.

The Board generally deals with conservation and allocation issues, gear limitations, etc., and ensures that its regulations are consistent with Pacific Salmon Treaty provisions. The current management plans for the southeast Alaska fishery, adopted in 1994 and later, are reported in regulation booklets, published separately for the commercial fishery (ADF&G 1994a), sport fishing (ADF&G 1996a, 1997e) and subsistence and personal use fisheries (ADF&G 1996b). In addition to these regulation booklets, ADF&G publishes annual regulatory guides and management plans which provide updated information on fishery regulations and plans. In addition to the regulations found in these booklets and guides, ADF&G may promulgate inseason emergency orders as required to implement Board regulations and policy and to ensure conservation of salmon stocks.

The Alaska Department of Fish and Game

ADF&G determines openings and closings for each of the gear types based on the regulations. ADF&G monitors the fisheries and collects data on the stocks and the performance of the fisheries. Emergency orders are issued to close individual fisheries for conservation needs and to comply with management plans.

Regional staff of ADF&G prepare various annual reports on the status of the salmon stocks and the various fisheries for southeast Alaska and provide appropriate copies to the Board, the PSC, and the Council (e.g., Frenette 1996, ADF&G 1997a). The reports provided to the PSC serve as components of the Commission's annual report and those provided to the Council serve as components of the Council's annual stock assessment and fishery evaluation report.

The Alaska Commercial Fisheries Entry Commission

The Commercial Fisheries Entry Commission is an independent, quasi-judicial State agency responsible for promoting the conservation and sustained yield management of Alaska's fishery resources and the economic health and stability of the commercial fishing by regulating entry into the fishery. The Commission's activities fall into three categories: licensing, research, and adjudication. In 1974, the Commission began establishing the maximum number of power trollers that may participate in the commercial salmon fishery in southeast Alaska; in 1980, it began limiting hand trollers.

The Alaska Department of Public Safety

The Fish and Wildlife Protection Division of the Alaska Department of Public Safety enforces the State regulations that implement the Alaska salmon fishery plan in cooperation with the NMFS Enforcement Division and the U.S. Coast Guard.

Appendix 2 Description and Management of Southeast Alaska Salmon Fisheries

The State of Alaska regulated and managed salmon fishery includes commercial, recreational, subsistence and personal use salmon fishing. Recreational gear consists of rods and lines. The gear used in the commercial fishery consists of troll lines, drift gillnet, set gillnet, and purse seine nets; although only troll and sport gear are allowed in the EEZ waters. The gear used in the subsistence and personal use fishery, which occur only in State waters, is gillnet. The majority of the various fisheries within the southeast Alaska salmon fishery are mixed-stock and mixed-species fisheries.

Commercial Fishery

Commercial fishing is allowed in both State and EEZ waters; however, only troll gear is allowed in the EEZ waters. Commercial fishing in State waters consists of troll, drift gillnet, set gillnet, and purse seine gear. Anyone commercial fishing is required to hold a gear-specific fishing permit which is good for all areas open for that gear within southeast Alaska. Salmon permits are “limited entry” permits and must be obtained by transfer from a current permit holder. Limited-entry permits do not have to be fished every year; however, the annual renewal fee must be paid each year in order to keep the permit valid. If renewal fees are not paid for two years, the permit may be forfeited to the State. Forfeited limited entry permits are removed from the fishery. In addition, any vessel that is used in a commercial fishery must be registered with ADF&G for that gear type.

Most (>85%) of the purse seine, drift gillnet, set gillnet, and power troll permits are fished each year, while only around 40% of the hand troll permits might be fished in any given year. About 70% of the gillnet and 85% of the troll permit holders are Alaska residents; over half (57%) of the purse seine permit holders are non-Alaska residents (mostly from Washington State).

Management of the southeast salmon fishery is described in several management plans put out annually by ADF&G; recent plans include: 1) winter troll, 2) summer troll, 3) all-gear chinook and coho, 4) drift gillnet, 5) purse seine, and 6) Yakutat set gillnet management.

All-Gear Chinook Fishery

The allowable catch of treaty chinook salmon is defined by the Pacific Salmon Treaty (PST); in the past, this was based on ceiling management for four major chinook fisheries along the coast, including the Alaska all-gear chinook fishery. For the Alaska fishery, an Alaskan hatchery add-on minus a risk factor was allowed to provide access to increased Alaska hatchery production. The allowable catch of treaty chinook salmon is defined by the Pacific Salmon Treaty (PST); in the past, this was based on ceiling management for four major chinook fisheries along the coast, including the Alaska all-gear chinook fishery. For the Alaska fishery, an Alaskan hatchery add-on minus a risk factor was allowed to provide access to increased Alaska hatchery production. The all-gear chinook salmon fishery is managed to achieve a harvest target based on the Pacific Salmon Treaty. The Treaty specifies a harvest based on a relationship between the preseason abundance index generated by the Pacific Salmon Commission’s Chinook Technical Committee and a target harvest rate specified in the Treaty. The Treaty also provides for an inseason adjustment to the harvest level based on an assessment of inseason data. The plan provides an algorithm for determining the all-gear allowable catch of chinook (minus some terminal exclusion areas) for the southeast Alaska fishery based on preseason and inseason estimates of chinook abundance. In addition, decreases in the allowable catch are triggered by conservation concerns of specific stock groups.

Most of the chinook catch in southeast Alaska is taken in the troll fishery. By Board regulation (1997), the set gillnet fishery is limited to 1,000 treaty chinook salmon; the drift gillnet fishery, to 8,600 treaty chinook salmon; and the purse seine fishery to 4.3% of the aggregate all-gear treaty chinook allowable catch as determined by the PSC process [FB 5AAC 33 365]. In the net fishery, chinook salmon are taken incidentally in targeting other species. Of the treaty chinook salmon remaining from the PST allowable catch after the

net fishery allocations, 80 percent goes to the troll fishery and 20 percent to the sport fishery. These new Board regulations for the net fishery chinook allocation do not greatly change the previous allocation between gear groups but, rather, just the computation of the allocation, allowing the purse seine fishery allocation to vary with abundance.

Generally, most of the chinook salmon caught in net fisheries are from the purse seine fishery. ADF&G may use chinook nonretention regulations for the purse seine fishery and/or night closures for the gillnet fishery (nonretention for the gillnet fishery may provide little benefit as an unknown number of gillnetted salmon can be released alive). Nonretention periods for the purse seine fishery occur most years, while night closures for gillnet fishery are rare.

Landed chinook salmon must measure at least 28 inches; undersized chinook salmon must be returned to the water without injury. An exception exists for the purse seine fishery, that fishery may land chinook salmon less than 21 inches as these would be too difficult to pick out of the large landings of pink salmon. In addition, the sport fishery sometimes allows for retaining chinook salmon under 28 inches in some terminal fisheries.

Troll Fishery

The troll fishery operates in both State and Federal waters, although, the majority of the catch and effort occurs in the State waters. The troll fishery has two seasons, the winter season, October 11-April 14, and the summer season, April 15-September 30. The winter troll fishery is limited to within State waters, has low fishing effort due largely to the time of year and weather, and, due to this low effort, is open throughout the period. Historically, as more restrictions were placed on the summer fishery, catches in the winter season increased. A chinook catch limit for the winter fishery was defined by Board regulation at 45,000 fish, beginning with the 1994 season; this level of chinook harvest has not been reached since it was instituted.

The troll fishery targets primarily chinook and coho salmon, with other salmon species taken incidentally; the winter troll fish catch is primarily chinook salmon. The chinook catch is regulated according to the all-gear chinook plan described above; the coho catch is managed to provide optimal yield of the many Alaska coho stocks present in the area while minimizing the catch of chinook salmon during chinook nonretention periods.

Management objectives for the chinook and coho troll fishery include:

- a. Manage the fishery according to the southeastern Alaska-Yakutat chinook and coho salmon fishery management plan.
- b. Comply with the conditions of the NMFS Incidental Take Statement.
- c. Achieve catch allocations among user groups as mandated by the Board.
- d. Achieve the allowable chinook salmon harvest.
- e. Maximize the harvest of Alaska hatchery-produced chinook salmon.
- f. Continue the coastwide natural chinook salmon stock rebuilding programs.
- g. Minimize the incidental mortality of chinook salmon to the extent practical.
- h. Provide adequate escapement of coho salmon by area.
- i. Achieve the escapement goal ranges for those coho stocks that have goals.
- j. Provide maximum opportunities for harvest of coho salmon consistent with conservation objectives.

For both chinook and coho salmon, the troll catch in EEZ waters represents only about 6% of the total landed catch for the respective species in recent years (1991-1996 average). Most of the troll catch in EEZ waters is by power troll since hand troll vessels are typically smaller than power troll vessels and are not well suited to fish the offshore areas. Between 1975 and 1996, on average 324 chinook were reported landed from hand troll gear from the EEZ. The power troll catch in the EEZ averaged 37,044 between 1975 and 1996. Chinook catches in the EEZ waters have decreased since the 1970's such that the percent of the EEZ catch that is

chinook salmon has decreased from 39% in the 1970s to 4% in the 1990s. For all species, the salmon catch in EEZ waters is less than 1% of the total Southeast Alaska salmon catch.

Drift Gillnet Fishery

The drift gillnet fishery operates only in State waters. Five drift gillnet fishing areas have been defined for southeast Alaska: District 101 (Tree Point and Portland Canal), 106 (Prince of Wales), 108 (Stikine), 111 (Taku-Snettisham), and 115 (Lynn Canal).

The primary objectives for management of the drift gillnet fishery in southeast Alaska are:

- i. Obtain overall salmon spawning escapement goals with the best possible distribution to all systems.
- ii. Provide for an orderly fishery while harvesting those fish in excess of escapement needs.
- iii. Promote the harvest and processing of good quality fish within the constraints dictated by run size.
- iv. Manage for a total allowable catch of chinook of 7,600 chinook salmon, exclusive of Alaska hatchery-produced fish [Board regulation 5 AAC 33.365.(10)(B)].
- v. Minimize, to the extent possible, the interception of salmon destined for locations where weak returns are expected.

Achievement of these management objectives will be accomplished by inseason adjustments of fishing time to control harvests in specific areas in accordance with salmon run strength and timing.

Drift gillnet landings have averaged approximately 2.5 million salmon annually from 1960 to 1996. Of the total commercial salmon harvest in southeast Alaska, the drift gillnet fishery harvests an average of 39% of the sockeye, 23% of the chum, 13% of the coho, 4% of the pink, and 4% of the chinook salmon. The drift gillnet fishery targets primarily on sockeye, pink, and summer chum salmon during the summer season and on coho and fall chum salmon during the fall season. Chinook salmon are usually harvested incidentally, although some targeted chinook salmon fisheries are allowed in terminal hatchery areas in the spring. Currently, directed drift gillnet fisheries for natural stocks of chinook salmon do not exist in southeast Alaska. Indicator stocks for ESA listed salmon species have not been recovered in the drift gillnet fishery.

Purse Seine Fishery

The purse seine net fishery operates only in State waters. Regulations allow purse seine fishing in Districts 101 through 107 and 109 through 114 with area restrictions in Districts 101, 106, 111, and 114. Although these areas are specified as designated seine fishing areas, specific open areas and fishing periods are established inseason by emergency order from ADF&G. Purse seining is allowed also in terminal hatchery fishing areas.

The primary management goals for the purse seine fishery are:

- i. Obtain overall pink and chum salmon spawning escapement goals with the best possible distribution to all systems.
- ii. Provide for an orderly fishery while harvesting fish in excess of spawning escapement needs.
- iii. Minimize, to the extent possible, the interceptions of salmon destined for fishing districts where weak returns are expected.
- iv. Promote a harvest of good quality fish within constraints dictated by run size and timing.
- v. Manage the District 104 purse seine fishery consistent with the provisions of the U.S./Canada Pacific Salmon Treaty.

- vi. Restrict the total purse seine harvest of chinook salmon (28 inches or larger) to no more than 4.3% of the all-gear chinook salmon catch ceiling established for the season (new Board regulation starting in 1997).

Inseason assessments of pink salmon run strength are determined primarily from spawning escapement information obtained from aerial surveys of terminal areas and streams and from fishery performance data.

On average, purse seiners harvest 70% to 90% of the salmon caught in the southeast Alaska commercial fishery. Because pink salmon is the primary species targeted by the seine fleet, most management actions are based on the abundance of pink salmon stocks. Other species are generally harvested incidentally to pink salmon; although some specific management actions for other species may occur to conserve or target stocks depending on their status. On average, since the 1970s, sockeye salmon have accounted for 2%, coho 1%, and chinook less than 1% of the total purse seine salmon harvest; during this time chum salmon have increased from 4% to 9% of the seine catch.

Yakutat Set Gillnet Fishery

The set gillnet fishery operates only in State waters and, within southeast Alaska, only in the Yakutat area which consists of the waters between Cape Suckling and Cape Fairweather. Set gillnet gear is the only net gear permitted in the Yakutat area. Twenty-five unique set net fisheries have been defined in the Yakutat area; most occur in bays, inlets, or river mouths. Permit holders may fish in any open set net fishing area and they may move between fishing areas during the season as long as not more than one river is fished concurrently. The number of nets and the aggregate length of all nets aboard a vessel vary from area to area.

The set gillnet fisheries are managed by adjusting fishing times and areas in each fishery in response to inseason assessments of run strength. These actions are taken to provide adequate spawning escapements and to allow harvest of salmon that are surplus to escapement goals. Inseason assessment methods include both fishery performance and spawning escapement information.

All five salmon species are harvested in the Yakutat area, with sockeye, coho, chinook, and pink salmon comprising the majority of the catch in that order of importance. No indicator stocks for ESA listed salmon stocks have been recovered in the Yakutat area. Most of the set gillnet fisheries target sockeye salmon from mid-June through July and coho salmon in August and September. The only targeted pink salmon fishery occurs in the southeast portion of Yakutat Bay on fish returning to Humpback creek. Set gillnet fisheries in the Yakataga District harvest primarily coho salmon.

Sport Fishery

Sport fishing is allowed in both State and EEZ waters; however, most sport fishing occurs in State waters in boats close to shore or from the shore itself. The fishing season is open year round for all salmon species in both fresh and marine waters, except that chinook salmon may not be taken from fresh water between Cape Fairweather and Dixon Entrance.

To sport fish in Alaska, one must have a valid State of Alaska sport fishing license; licenses are required annually. In general, anglers sport fishing for chinook salmon must purchase a current year's special salmon tag for chinook salmon. Sport fishing may be conducted only by use of a single line attached to a rod or pole and having not more than one plug, spoon, spinner, or series of spinners, or two flies, or two hooks. The line must be closely attended. The number of poles on a charter vessel are limited to the number of clients onboard.

Regionwide regulations for bag and possession limits differ for fresh waters and salt waters and by species and are given in the annual sport fishing regulations summary (ADF&G 1966a). In addition, area specific regulations deal with area closures and bag and possession limits; these are also found in the annual summary. Regulations are in effect from April 15 to April 14 of the following year.

The chinook sport fishery has a special management plan to ensure that the fishery abides by the all-gear chinook fishery plan and that it contributes to the conservation and rebuilding of this natural resource. Bag limits for chinook salmon taken in salt water generally are 2 daily and 2 in possession with a 28-inch minimum size; however, the limit may vary from 1 to 3 daily and in possession depending on the annual allocation to the sport fishery. In 1997 a season bag limit was implemented for nonresident sport anglers of 4 chinook salmon.

In compliance with Board regulations, ADF&G manages the southeast Alaska chinook salmon sport fishery in marine waters such that it harvests approximately 20 percent of an allowable sport/troll treaty chinook catch determined by subtracting the commercial net allocations from the all-gear catch quota specified by the PST process. ADF&G uses preseason and inseason estimates of the treaty chinook catch to modify sport fishing regulations in order to not exceed the allocation quota for a given year. A reliable estimate of total sport catch from the statewide harvest survey is not available until after the year is over.

State objectives of the chinook sport fishing management plan are to allow uninterrupted sport fishing for chinook salmon in marine waters, while not exceeding the allocation harvest, and to minimize regulatory restrictions on anglers not fishing from a charter vessel. If it appears that the sport catch of chinook salmon will exceed the allocation, ADF&G may reduce the bag and possession limits, increase the minimum size, and/or introduce area closures. Special restrictions for charter vessel fishing may also be used as needed, such as prohibiting down riggers, nonretention by charter vessel operators and crew, and reducing bag and possession limits (see the 1997 Southeast Alaska Sport Fishing Regulations Summary).

Subsistence and Personal Use Fishery

Subsistence and personal use fisheries are allowed in State waters only. The general taking of salmon for subsistence and personal use purposes is regulated and only Alaskan residents are allowed to participate. For personal use fishing, a valid subsistence or personal use fishing permit issued by the ADF&G Commissioner, or his local representative, and a valid sport fishing license are required for salmon, unless one is retaining salmon from his/her legally obtained commercial catch for personal use. Catch reports must be completed on forms provided by ADF&G and submitted to the department office from which the permit was issued. General subsistence permits are not allowed for chinook salmon. However, in the Taku River only, chinook salmon taken incidentally while legally subsistence or personal-use fishing may be retained; these fish must be reported on the catch records of the permit holder.

Appendix 3: Salmon Escapement Goal Policy and Regulations

SALMON ESCAPEMENT GOAL POLICY

Alaska Department of Fish and Game

Introduction:

The Alaska Constitution (Sec. 4, Article VIII) mandates the Alaska Department of Fish and Game (hereafter referred to as the department) to manage fishery resources “on the sustained yield principle”. For salmon fisheries with low levels of fishing power, sustained yield can be achieved by conservative management practices such as limited catch quotas and limited scheduled fishing periods. However, for fisheries with expanding levels of fishing effort or excessive fishing power, sustained yield management requires that the department assess the number of salmon that spawn on an annual basis. The department has the authority (AS16.05.020) to establish the annual level of salmon spawning stock required to maintain a sustainable harvest and also to manage commercial, sport, personal use, and subsistence fisheries to ensure that annual spawning escapement requirements are met.

The mission of the department needs to be clearly defined with respect to the mandated sustained yield principle. A wide range of sustainable yield levels is possible for salmon fisheries. The department has developed a variety of methods and procedures for enumerating salmon spawning stock levels. The department has also developed methods for estimating the salmon carrying capacity of freshwater rearing environments for selected stocks. This information has enabled the department to obtain a better scientific understanding of the relationship between salmon spawning stock level and resulting level of return. Consequently, scientifically based spawning stock levels that produce the maximum number of fish available for harvest can be estimated for many salmon fisheries.

Unless otherwise directed by regulation, the department will manage Alaska's salmon fisheries, to the extent possible, for maximum sustained yield as measured in numbers of fish. To this end, the department will aggressively pursue the further development of escapement enumeration programs, in-season fishery management programs, and scientific methods to determine escapement levels that produce maximum sustained yield. In situations where the department lacks the necessary management program and scientific information to manage for maximum sustained yield, fishery management measures will be adopted to ensure that harvests are sustainable.

Purpose of the Escapement Goal Policy:

This policy applies to wild anadromous Pacific salmon. The purposes for this policy are to:

1. Define concepts relating to escapement goals.
2. Specify criteria and procedures for establishing and modifying escapement goals.
3. Establish a process that facilitates public review of allocative issues associated with establishing and modifying escapement goals.

Definitions:

Salmon: Any of the following five wild anadromous semelparous Pacific salmon species (*Oncorhynchus* sp. exclusive of steelhead and cutthroat trout) native to Alaska: chinook, coho, sockeye, chum and pink salmon.

Stock: A locally interbreeding group of salmon which 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. This definition is consistent with "stock" as defined in statute (AS 16.05.940(15)).

Escapement: Annual estimated size of the spawning stock. Quality of the escapement may be judged 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 spawning habitat.

Yield: The number (or weight) of fish harvested in a particular year or season from a stock.

Sustainable Yield: average annual yield that results from a level of escapement that can be maintained on a continuing basis. A wide range of average annual yield levels is sustainable; likewise, a wide range of annual escapement levels can produce sustainable yields.

Maximum Sustainable Yield (MSY): greatest average annual yield from a stock. In practice, MSY is approached when a level of escapement within a range is maintained 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 escapement and subsequent return. The concept of maximum sustained yield 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.

Biological Escapement Goal (BEG): Escapement that provides the greatest potential for maximum sustained yield. The BEG will be the primary management objective for the escapement unless an optimal escapement or in-river run goal has been adopted. A BEG will be developed from the best available biological information, and should be scientifically defensible on the basis of available biological information. The BEG will be determined by the Department of Fish and Game and will be expressed as a range based on factors such as stock productivity and data uncertainty. The department will seek to maintain escapements evenly within the bounds of the BEG.

Sustainable Escapement Goal (SEG): a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yields 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 in-river 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 of Fish and Game 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.

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

Optimal Escapement Goal (OEG): a specific management objective for the escapement that considers biological and allocative factors and may differ from the SEG or BEG. The OEG will be sustainable and may

be expressed as a range with the lower bound above the level of SET, and will be placed into regulation by the Alaska Board of Fisheries. The department will seek to maintain escapements within the bounds of the OEG.

Management Concern: a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a stock within the bounds of the SEG, BEG, OEG, or other specified management objectives for the fishery. The term chronic means the continuing or anticipated inability to meet escapement objectives over a four to five year period, which is roughly equivalent to the generation time of most salmon species. A management concern is not as severe as a conservation concern, which refers to a stock that fails to consistently meet its sustained escapement threshold (SET).

Conservation concern: a 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). "Chronic inability" means the continuing or anticipated inability to meet escapement thresholds over a four to five year period, which is roughly equivalent to the generation time of most salmon species. A conservation concern is more severe than a management concern, which refers to a stock that fails to consistently achieve sustainable escapement, biological escapement, or optimal escapement goals.

Action Point: threshold value for some quantitative indicator of stock run abundance at which some explicit management action will be taken to reach an in-river run goal or an OEG. An action point will be derived from criteria about locations or dates and include a statistical projection of abundance, escapement, or harvest.

In-River Run Goal: a specific management objective for stocks that are subject to harvest upstream of the point where escapement is estimated. The in-river run goal will be set and placed into regulation by the Alaska Board of Fisheries and is comprised of the SEG, BEG or OEG plus specific allocations to in-river fisheries.

Procedures for Documenting, Establishing and Modifying, and Reviewing Escapement Goals:

Documentation of Existing Escapement Goals:

The department will document existing escapement goals for Alaska salmon fisheries in a series of reports prepared for each fisheries management region. Escapement goals will be summarized by species, fisheries management area, and stock for the following fishery management regions: 1) Southeast Alaska Region, which includes the Southeast Alaska and Yakutat regulatory areas; 2) Central Region, which includes the Prince William Sound, Cook Inlet and Bristol Bay regulatory areas; 3) A-Y-K Region, which includes the Kuskokwim, Yukon, Norton Sound-Port Clarence, and Kotzebue-Northern regulatory areas; and 4) Westward Region, which includes the Kodiak, Chignik, and Alaska Peninsula-Aleutian Islands regulatory areas. The Chief Fisheries Scientist for the Commercial Fisheries Division will maintain a statewide summary document that tabulates escapement goals for each of the fisheries management regions.

Reports will encompass all stocks that are currently managed for an escapement goal. The department will classify each goal so that it is consistent with this policy, provide a brief explanation of the genesis of the current goal, identify the method for estimating or indexing escapement, and identify the fishery division having primary management responsibility. It is the department's intent to revise reports as escapement goals are established or modified.

Establishing and Modifying Escapement Goals:

The department will follow these guidelines for establishing and modifying escapement goals:

1. Escapement goals will be established recognizing that escapement consists of many individual spawning populations and that it is not technically or logistically possible to assess each individual spawning population. Escapement goals will be established for aggregates of individual spawning populations with similar productivity and vulnerability to fisheries, and the aggregate stock managed as a unit.
2. SEGs will be established for stocks for which the department can reliably estimate or index salmon escapement levels, and when information is not available to estimate the range of escapements that produce MSY. For these stocks, an SEG will be established based on past levels of escapement that produced sustainable yields over a 5 to 10 year period. SEGs will be set as a range of escapement levels, rather than as a single escapement level.
3. BEGs will be established for stocks for which the department can reliably estimate or index salmon escapement levels as well as total annual returns. BEGs will be changed to conform to the escapement goal policy. BEGs will be changed whenever new information indicates that future sustained harvest levels can be increased by that change.
4. BEGs will be set as a range of escapement levels, rather than as a single escapement level. The lower and upper limits of the escapement range will be consistent with MSY and will be based on factors such as variability in stock productivity and data uncertainty.
5. Whenever the department wishes to establish a new BEG or modify an existing BEG, a scientific analysis with supporting data must be prepared.
6. Whenever significant allocation impacts arise from management actions needed to achieve a proposed BEG, findings will be presented to the Alaska Board of Fisheries for resolution of allocative impacts.
7. Estimates of SEGs or BEGs for individual stocks will be based on the best available scientific information.

Review Process for Escapement Goals:

The department will follow these guidelines whenever reviewing escapement goals:

1. An analysis supporting establishment of a new SEG or BEG or modification of an existing SEG or BEG will be developed within the region of the division with primary management responsibility for the affected stock. The region developing the proposal will provide opportunities for appropriate personnel from other regions and divisions to participate in developing the analysis.
2. Following development of the SEG or BEG analysis, an inter-divisional review team will be appointed by the appropriate regional supervisors of the Commercial Fisheries and Sport Fish Divisions. Regional supervisors may request technical assistance from their respective division's headquarters, and non-departmental scientists. The review team will technically evaluate the SEG or BEG by reviewing available scientific information and analyzing the impact of the proposed or modified SEG or BEG on existing management programs for affected stocks. In addition, the review team will make a determination of whether significant allocative impacts will arise from management actions needed to achieve the proposed or modified SEG or BEG.
3. If the team, by consensus, determines that no significant allocative impact will arise from management actions to achieve the proposed or modified SEG or BEG, the SEG or BEG will be submitted to the director of the division with primary management responsibility for approval.
4. If the team cannot achieve a consensus, either with respect to the bounds of the SEG or BEG or the

determination of allocative impact, the SEG or BEG will be submitted to the division directors (and to the Commissioner, if necessary) for resolution.

5. If a determination of significant allocative impact is made, the department will ask the Alaska Board of Fisheries to establish an OEG and associated management plan.

Review of Existing Escapement Goals and Establishing New Escapement goals:

Specific proposals for establishing and modifying SEGs or BEGs will be developed as new scientific information is obtained, new methods or programs for escapement enumeration are implemented, and department staff time is available. The department will review OEGs either at the request of the Alaska Board of Fisheries or on a schedule that conforms to the Alaska Board of Fisheries cycle of consideration of area regulatory proposals.

Public Review and Implementation of Biological Escapement Goals: Escapement Goals with Little or No Allocative Impact:

The public will be informed whenever new SEGs or BEGs are established or existing BEGs are modified. This process may include news releases, announcements posted at department office buildings, and review of changes with Advisory Committees in affected areas and with groups that use affected stocks.

Escapement Goals with Potentially Significant Allocative Impact:

For fisheries not otherwise managed under a regulatory plan it is the department's intent to ensure that SEGs or BEGs are attained for all the harvested stocks. Whenever a significant allocation issue or a management concern arises from proposed management actions needed to achieve SEGs or BEGs, the department will request regulatory action from the Alaska Board of Fisheries to adopt a regulatory management plan that establishes OEGs for affected stocks. A draft management plan will be prepared by the department and submitted to the Alaska Board of Fisheries for consideration. The department will determine SEGs and BEGs for affected stocks which have sufficient data for establishment of SEGs or BEGs, and will analyze and provide advice on biological and allocation impacts of various OEGs the Alaska Board of Fisheries may wish to consider.

In developing draft management plans for stocks with significant in-river harvests, specific allocations to in-river fisheries will be added to the SEG, BEG or OEG to set an in-river run goal. Fisheries downstream of the point where escapement is estimated will be managed to achieve the in-river run goal. The draft management plan may define specific action points and associated management actions that the department will follow in managing fisheries to meet the OEG or the in-river run goal.

5 AAC 39.223. POLICY FOR STATEWIDE SALMON ESCAPEMENT GOALS. (a) Both the Alaska Department of Fish and Game and the Board of Fisheries (board) are charged with the duty to conserve and develop Alaska's fisheries under 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 escapement goals and further, to establish a process that facilitates public review of allocative issues associated with these escapement goals. Definition of terms used in this policy are contained in the Sustainable Salmon Fisheries Policy specified in 5 AAC 39.222.

(b) In recognition of its joint responsibilities, the department will:

- (1) document existing salmon escapement goals for all stocks that are currently managed for an escapement goal;
- (2) establish biological escapement goals (BEGs) for stocks for which the department can reliably enumerate salmon escapement levels as well as total annual returns;

(3) establish sustainable escapement goals (SEGs) for 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 BEGs;

(4) establish sustainable escapement thresholds (SETs) as provided by the Sustainable Salmon Fisheries Policy;

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

(6) review existing, or propose new, BEGs, SEGs and SETs on a schedule that conforms to the Board of Fisheries 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. The department will, in its discretion, or in collaboration with the board, conduct independent peer reviews of its BEG, SEG and SET analyses;

(8) notify the public whenever new BEGs, SEGs or SETs are established or existing BEGs, SEGs or SETs are modified;

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

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

(1) take such regulatory actions as may be necessary to address allocation issues arising from implementation of new or modified BEGs, SEGs and SETs;

(2) during its regulatory process, review the department determined BEGs, SEGs and SETs and, with the assistance of the department, determine the appropriateness of establishing OEGs. The board will provide an explanation of the reasons for establishing an OEG and provide, to the extent practicable, with the assistance of the department, an estimate of expected differences in yield of any salmon stock, relative to MSY, resulting from implementation of an OEG.

**Appendix 4: Pacific Salmon Treaty, Annex IV, Chapter 3
Chinook Salmon**

The complete Pacific Salmon Treaty is available on the web at:
<http://www.psc.org/Treaty/TREATY.HTM>

The provisions of this Chapter shall apply for the period 1999 through 2008.

1) The Parties shall:

(a) establish a chinook management program that meets the following objectives:

- (i) provides a long-term abundance-based framework for managing all chinook fisheries subject to the Treaty;
- (ii) introduces harvest regimes that are based on estimates of chinook abundance, that are responsive to changes in chinook production, that take into account all fishery induced mortalities and that are designed to meet MSY or other agreed biologically-based escapement objectives;
- (iii) halts the decline in spawning escapements in depressed chinook salmon stocks;
- (iv) sustains healthy stocks and rebuilds stocks that have yet to achieve MSY or other biologically-based escapement objectives;
- (v) defines the specific obligations of all the various fisheries in maintaining healthy chinook salmon stocks, rebuilding depressed naturally spawning chinook stocks that are not meeting escapement objectives and providing a means for sharing the harvest and the conservation responsibility for chinook stocks coastwide among the Parties; and,
- (vi) develops biological information pursuant to an agreed program of work and incorporates that information into the coastwide management regime;

(b) maintain a joint Chinook Technical Committee (the "CTC") reporting unless otherwise agreed, to the Pacific Salmon Commission (the "Commission"), which shall, *inter alia*,:

- (i) evaluate management actions for their consistency with measures set out in this Chapter, and for their potential effectiveness in attaining the specified objectives;
- (ii) report annually on catches, harvest indices, estimates of incidental mortality and exploitation rates for all chinook fisheries and stocks harvested within the Treaty area;
- (iii) report annually on the escapement of naturally spawning chinook stocks in relation to the agreed escapement objectives referred to below, evaluate trends in the status of stocks and report on progress in the rebuilding of naturally spawning chinook stocks;
- (iv) evaluate and review existing escapement objectives that fishery management agencies have set for chinook stocks subject to this Chapter for consistency with MSY or other agreed biologically-based escapement goals and, where needed, recommend goals for naturally spawning chinook stocks that are consistent with the intent of this Chapter;
- (v) recommend standards for the minimum assessment program required to effectively implement this Chapter, provide information on stock assessments relative to these standards and recommend to the Commission any needed improvements in stock assessments;
- (vi) review effects of enhancement programs on abundance-based management regimes and recommend strategies for the effective utilization of enhanced stocks;
- (vii) recommend research projects, and their associated costs, required to implement this Chapter effectively;
- (viii) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives; and,
- (ix) undertake specific assignments such as those described in the Appendix to this Chapter.

2. The Parties agree to implement, beginning in 1999 and extending through 2008, an abundance-based coastwide chinook management regime to meet the objectives set forth in paragraph 1 (a) above, under which fishery regimes shall be classified as aggregate abundance-based management regimes ("AABM") or

individual stock-based management regimes ("ISBM"):

(a) an AABM fishery is an abundance-based regime that constrains catch or total adult equivalent mortality to a numerical limit computed from either a pre-season forecast or an in-season estimate of abundance, and the application of a desired harvest rate index expressed as a proportion of the 1979-82 base period. The following regimes will be managed under an AABM regime:

- (i) southeast Alaska sport, net and troll;
- (ii) Northern British Columbia (NBC) troll (statistical areas 1-5) and Queen Charlotte Islands (QCI) sport (statistical areas 1 and 2); and
- (iii) west coast of Vancouver Island (WCVI) troll (statistical areas 21, 23-27, and 121-127) and outside sport ¹.

(b) an ISBM fishery is an abundance-based regime that constrains to a numerical limit the total catch or the total adult equivalent mortality rate within the fisheries of a jurisdiction for a naturally spawning chinook stock or stock group. ISBM management regimes apply to all chinook fisheries subject to the Treaty that are not AABM fisheries. The obligations applicable to ISBM fisheries are:

- (i) a general obligation as set out in paragraph 4 (d) for all ISBM fisheries which include, but are not necessarily limited to: northern British Columbia marine net and coastal sport (excluding Queen Charlotte Islands), and freshwater sport and net; central British Columbia marine net, sport and troll and freshwater sport and net; southern British Columbia marine net, troll and sport and freshwater sport and net; West Coast of Vancouver Island inside marine sport and net and freshwater sport and net; south Puget Sound marine net and sport and freshwater sport and net; north Puget Sound marine net and sport and freshwater sport and net; Juan de Fuca marine net, troll and sport and freshwater sport and net; Washington Coastal marine net, troll and sport and freshwater sport and net; Washington Ocean marine troll and sport; Columbia River net and sport; Oregon marine net, sport and troll; Idaho (Snake River Basin) freshwater sport and net; and
- (ii) an additional obligation as set out in paragraph 4 (e) for those stock groups for which the general obligation is insufficient to meet the agreed escapement objectives.

¹ The part of the West Coast Vancouver Island chinook sport fishery included in the WCVI AABM chinook fishery includes:

- Areas 21, 23, 24 inside the Canadian "surflines" and Areas 121, 123, 124 during the period October 16 through July 31, plus that portion of Areas 21, 121, 123, 124 outside of a line generally one nautical mile seaward from the shoreline or existing Department of Fisheries and Oceans surflines, during the period August 1 through October 15.
- Area 25, 26, 27 inside the Canadian "surflines" and Areas 125, 126, 127 during the period October 16 through June 30, plus that portion of Area 125, 126, 127 outside of a line generally one nautical mile seaward from the shoreline or existing Department of Fisheries and Oceans surflines, for the period July 1 through October 15.

3. The Parties agree:

(a) to adopt a management framework for chinook salmon based on total fishing mortality; (b) that, because significant uncertainty presently exists in predicting and estimating incidental mortality, the adoption of fishery regimes based on total mortality will require improvements in estimates of incidental mortality based upon direct fishery observations;

(c) that a total fishing mortality approach will be implemented as soon as the required technical improvements in predictions and estimates of incidental mortality can be made. The intent of the Parties is that such an approach be adopted for all fisheries by 2002 if possible;

(d) that during the interim period, enhancements to the catch-based regimes as noted in the CTC Report TCChinook (98)-1 (December 2, 1998) will be adopted as follows:

- (i) beginning in 2000, total adult equivalent fishing mortality in each AABM fishery shall be constrained by expressing the fishery management objective as a target catch index and a

- standardized management regime (e.g., minimum size limit of x , ratio of encounters in chinook retention to chinook non-retention periods not to exceed y). Each fishery will be managed in a manner consistent with the standardized management regime for that fishery;
- (ii) beginning in 2000, in those AABM fisheries where the CTC has determined that an accurate, consistent and verifiable relationship exists between the catch index and the total adult equivalent mortality index, total fishing mortality will be constrained by expressing the fishery management objective as a target catch index that has been derived from an agreed fishery harvest rate, where the total adult equivalent mortality index cannot exceed the target catch index by more than the average percentage differences observed during the period 1985-95. Such an amount will be fishery specific;
- (e) as an incentive to reduce incidental mortalities, the Parties may submit to the Commission for review, modifications to the standardized fishing regimes pursuant to paragraph 3 (d) believed to result in reductions to incidental mortalities in an AABM fishery. Following review and evaluation by the CTC pursuant to paragraph 3 (d) (ii), 50% of the reductions in the adult equivalent incidental mortalities attributed to the modification can be added to the allowable catch for the AABM fishery.

4. The Parties agree that in respect of ISBM fisheries:

- (a) their intent is that the fisheries shall be managed over time to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;
- (b) until such times as the ISBM fisheries are managed to meet those escapement objectives, and unless otherwise recommended by the CTC, the non-ceiling index defined in TCChinook (96)-1 (February 15, 1996) will be used to measure performance of ISBM fisheries;
- (c) the non-ceiling index for ISBM fisheries will be computed pre-season based on forecasted abundance and fishing plans and evaluated post season for each of the escapement indicator stocks listed in Attachments I to V to this Chapter;
- (d) for the purposes of this paragraph, until agreed escapement objectives for the stock groups listed in Attachments I to V to this Chapter have been achieved, Canada and the United States shall reduce by 36.5 percent and 40 percent respectively, the total adult equivalent mortality rate, relative to the 1979-82 base period², in their respective ISBM fisheries that affect those stock groups. The reduction identified in this sub-paragraph shall be referred to as the "general obligation";

² Assuming size limits in effect during 1991-1996.

- (e) for those stock groups for which the general obligation is insufficient to meet the agreed escapement objectives, the jurisdiction within which the stock group originates shall implement either:
- (i) additional reductions as necessary to meet the agreed escapement objectives; or
- (ii) additional reductions, which taken together with the general obligation, are at least equivalent to the average of those reductions that occurred for the stock group during the years 1991-96; and
- (f) the reductions in ISBM fisheries may be allocated among fisheries within a jurisdiction provided that:
- (i) the obligations under sub-paragraphs (d) and (e) above are met;
- (ii) the achievement of the agreed escapement objective for other stocks or stock groups is not adversely affected; and
- (iii) the harvest impacts are not transferred among fisheries in a manner that results in the additional restrictions, pursuant to paragraph 9, in the ISBM or AABM fisheries in another jurisdiction.

5. The Parties agree that:

- (a) the graduated harvest rate approach specified in paragraph 6 shall be used in AABM fisheries and is designed to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;
- (b) the graduated harvest rate approach is based on a relationship between the aggregate abundance of chinook stocks available to the fishery and a specified harvest rate index;

- (c) AABM fisheries shall be managed annually to achieve the fisheries harvest rate index value designated for the applicable abundance index value as described in paragraph 6 below;
- (d) the allowable harvest level in an AABM fishery shall be based upon the best available pre-season predictions of abundance as determined by the CTC; and
- (e) where, as determined by the CTC, in-season predictors provide a more reliable prediction of the abundance than pre-season indicators alone, in-season adjustments of pre-season catch estimates shall be permitted. In such circumstances, pre-season catch estimates shall be adjusted by incorporating in-season estimates of abundance. The CTC has reviewed an in-season predictor for abundance of the chinook salmon in the SEAK troll fishery and concluded that the Bayesian method that incorporates both pre-season and in-season catch estimates based on approved in-season fishery performance data, is permitted.

6. The Parties agree that:

- (a) indices identified in this paragraph are consistent with CTC analyses through May 1999. In the event that subsequent analyses modify these values, the historical relationship between catch and abundance indices will be maintained.
- (b) beginning in 1999, management of the SEAK troll, net, and sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the SEAK troll fishery and an appropriate harvest rate index. The combined SEAK troll plus sport and net catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the SEAK troll, sport, and net fisheries shall be managed annually according to catch and abundance indices stated in Table 1.
- (c) beginning in 1999, management of the NBC troll and QCI sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the NBC troll fishery and an appropriate harvest rate index. The combined NBC troll plus QCI sport catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the NBC troll and QCI sport fisheries shall be managed annually according to catch and abundance indices stated in Table 1.
- (d) beginning in 1999, management of the WCVI troll and outside sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the WCVI troll fishery and an appropriate harvest rate index. The combined WCVI troll plus outside sport catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the WCVI troll and outside sport fisheries shall be managed annually according to catch and abundance indices stated in Table 1.

7. The Parties agree that, beginning in 1999, provisions for overage and underage shall be developed by the CTC as follows:

(a) in AABM fisheries:

- (i) the first post-season CTC model calibration will be used to compute the abundance index;
- (ii) a cumulative (across years) management range of 7.5 percent (subject to review by the CTC) shall be permitted;
- (iii) underages in excess of the management range in sub-paragraph (ii) above cannot be accumulated; and
- (iv) total mortality will be incorporated pursuant to paragraph 3.

(b) in ISBM fisheries:

- (i) consistency with the index applicable to ISBM fisheries pursuant to paragraph 4 will be assessed when the exploitation rate analysis for that year's fishery is completed;
- (ii) a cumulative (across years) overage of 7.5 percent (subject to review by the CTC) of the ISBM index shall be permitted;

(iii) underages in excess of the management range in sub-paragraph (ii) above cannot be accumulated; and

(iv) overages in ISBM fisheries for a stock group are to be assessed in aggregate over all of the Party's ISBM fisheries and any overages shall be adjusted within the jurisdiction's fisheries with the obligation that:

(1) achievement of agreed escapement objectives for other stocks or stock groups is not adversely affected; and

(2) harvest impacts are not transferred among fisheries in a manner that results in additional restrictions pursuant to paragraph 9 in the ISBM or AABM fisheries in another jurisdiction.

8. The Parties agree:

(a) to continue the procedures previously established by the Commission to allow for the exclusion of chinook salmon catches in selected terminal areas from counting against Treaty catch limitations; and

(b) to continue the procedures previously established by the Commission to allow for hatchery add-ons harvested in AABM fisheries.

9. The Parties agree that:

(a) the fishery harvest rate responses or other management actions outlined in sub-paragraphs (b) and (c) below, which are intended to return escapements as expeditiously as possible to MSY or other agreed biologically-based escapement objectives, and notwithstanding the provisions of paragraphs 4 and 6, shall only be implemented in ISBM and AABM fisheries in respect of those stocks for which the CTC review has been completed and agreed escapement objectives have been determined, when:

(i) beginning in 1999, if naturally spawning chinook stocks or stock groups listed in Attachments I - V to this Chapter are below the agreed escapement objectives for two consecutive years;

(ii) escapement of the stock or stock group would be increased by the adjustment;

(iii) there is a contributing causal relationship between the fishery harvest and the status of the stock or stock group, or the decline in the stock or stock group is due to natural phenomena; and

(iv) complementary and coordinated management actions are taken in other directed marine and freshwater chinook fisheries affecting the stock or stock group in accordance with (d) and (e) below;

(b) the additional management actions to be taken in relevant fisheries in accordance with this paragraph are as follows:³

Percentage reduction in index ⁴	Number of stock groups requiring response
10%	2 stock groups
20%	3 stock groups
30%	4+ stock groups

³ A stock group should be considered for additional management action pursuant to this paragraph if a significant loss of production results from escapement less than the agreed escapement objective for an extended period of time. By the end of 2001, the CTC will recommend, for adoption by the Commission, criteria defining the lower bound of escapement for

the purposes of taking additional management actions pursuant to this paragraph. Until the end of 2001, the escapement level at which the MSY production is reduced by more than 15% will be defined as the lower bound for escapement.

⁴ The index that applies to ISBM fisheries is described in paragraph 4; the index that applies to AABM fisheries is described in paragraph 6.

(c) the Parties may take other management actions as may be agreed by the Commission, such as time and area restrictions, which have comparable conservation benefits as identified in sub-paragraph (b) above;

(d) the measures specified in sub-paragraph (b) or (c) above apply to an AABM fishery when the provisions of sub-paragraph (a) above have been met, and:

(i) the obligation identified in paragraph 4 for ISBM fisheries has been complied with in all ISBM fisheries that affect the stock or stock group for two consecutive years that the stock or stock group has not achieved agreed biologically-based escapement objectives; and

(ii) the obligation identified in paragraph 6 for AABM fisheries has been complied with in all other AABM fisheries that affect the stock or stock group for two consecutive years that the stocks or stock groups have not achieved agreed biologically-based escapement objectives;

(e) the measures specified in sub-paragraphs (b) and (c) above apply to an ISBM fishery when the provisions of sub-paragraph (a) have been met, and:

(i) the obligation identified in paragraph 4 for ISBM fisheries has been complied with in all other ISBM fisheries that affect the stock or stock group for two consecutive years that the stock or stock group has not achieved agreed biologically-based escapement objectives; or

(ii) the measures specified in sub-paragraph (b) or (c) are being implemented in an AABM fishery that affects the stock or stock group;

(f) where, on the basis of a pre-season forecast of abundance, it is bilaterally agreed that, due to extraordinary natural circumstances, the continued biological viability of a stock group is seriously threatened, the harvest rate responses in the relevant fisheries set out above will be applied in the same year if management action is part of further complementary and coordinated management actions being taken in other marine and freshwater chinook fisheries affecting the stock group; and

(g) either Party may recommend, for conservation purposes, that the Commission adopt harvest responses in the relevant fisheries that are greater than those identified in sub-paragraphs (b) and (c) above.

Table 1
Catches specified for AABM fisheries at levels of the chinook abundance index

Values for catch at levels of abundance between those stated may be linearly interpolated between adjacent values.

Abundance Index	SEAK	NBC	WCVI
0.25	52500	32500	45800
0.30	59000	39000	55000
0.35	65500	45500	64200
0.40	72000	52000	73300
0.45	78500	58500	82500
0.495	84350	64350	90760
0.50	85000	65000	107000
0.55	91500	71500	117700
0.60	98000	78000	128300
0.65	104500	84500	139000
0.70	111000	91000	149700
0.75	117500	97500	160400
0.80	124000	104000	171100
0.85	130500	110500	181800
0.90	137000	117000	192500
0.95	143500	123500	203200
1.00	150000	130000	213900
1.005	151425	130650	245694
1.05	164300	136500	256700
1.10	178500	143000	268900
1.15	192800	149500	281100
1.20	207000	156000	293400
1.205	235100	156700	294600
1.25	243100	163300	305600
1.30	252000	170700	317800
1.35	261000	178000	330000
1.40	269900	185300	342300
1.45	278800	192700	354500
1.50	287700	200000	366700

1.505	311022	219568	367929
1.55	319700	226100	378900
1.60	329400	233400	391200
1.65	339100	240700	403400
1.70	348700	248000	415600
1.75	358400	255300	427800
1.80	368100	262600	440000
1.85	377700	269900	452300
1.90	387400	277200	464500
1.95	397100	284500	476700
2.00	406700	291800	488900
2.05	416400	299100	501200
2.10	426100	306400	513400
2.15	435700	313700	525600
2.20	445400	321000	537800
2.25	455100	328300	550100

Attachment I
S.E. Alaska troll, net & sport AABM Fisheries

Stock Group⁵	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years.
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
North/Central British Columbia	Two or more stocks below lower bound of goals	Yakoun, Skeena, Nass Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goals	Nehalem, Siuslaw, Siletz Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of goals	Up-river Brights, Deschutes, Lewis River	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Washington Coastal Fall naturals	Three or more stocks below goals	Hoko, Grays Harbor, Queets Hoh, Quillayute rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (Spring & summers)	Two or more stocks below lower bound of goals	Upper Fraser, Mid Fraser, Thompson	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

⁵ SEAK fisheries will be managed to achieve escapement objectives for Southeast Alaska and Transboundary River chinook stocks.

Attachment II

**Northern BC (Areas 1-5) troll &
Queen Charlotte Island sport (Areas 1&2) AABM Fisheries**

Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
North/Central British Columbia	Two or more stocks below lower bound of goals	Yakoun, Skeena, Nass Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goals	Nehalem, Siletz, Siuslaw Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Washington Coastal Fall naturals	Three or more stocks below lower bound of goals	Hoko, Grays Harbor, Queets Hoh, Quillayute Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years.
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of range	Up-river Brights, Deschutes, Lewis Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (Spring & summers)	Two or more stocks below lower bound of range	Upper Fraser, Mid Fraser, Thompson	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Attachment III
West Coast Vancouver Island troll & outside sport AABM Fisheries

Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Columbia River Falls	Two or more stocks below lower bound of goal	Up-river Brights, Deschutes, Lewis River	Escapement goal ranges	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement Goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goals	Skagit group, Stillaguamish, Snohomish, Lake Washington, Green Rivers	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years

**Attachment IV
All British Columbia ISBM Fisheries**

Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Lower Strait of Georgia	Below lower bound of aggregate goal for natural spawners	Cowichan, Nanaimo Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
North Puget Sound Natural Springs	Both stocks below lower bound of goal	Nooksack, Skagit Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome Nimpkish Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (spring & summers)	Two or more stocks below lower bound of goal	Upper Fraser ,Mid Fraser, Thompson	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goal	Skagit group, Stillaguamish, Snohomish , Lake Washington, Green River	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
North/Central British Columbia	Two or more stocks below lower bound of goal	Yakoun, Nass, Skeena, Area 8 (Atnarko, Dean rivers)	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Attachment V
All Southern U.S. ISBM fisheries

Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Washington Coastal Fall Naturals	Three or more stocks below lower bound of goal	Hoko, Grays Harbor Queets, Hoh Quillayute Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of goals	Up-river Brights, Deschutes, Lewis River	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goal	Skagit group, Stillaguamish, Snohomish, Lake Washington, Green Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goal	Nehalem, Siletz, Siuslaw Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
North Puget Sound Natural Springs	Both stocks below lower bound of goal	Nooksack, Skagit Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Appendix to Annex IV, Chapter 3

Understanding on the Application of Annex IV, Chapter 3 relating to assignments for the Chinook Technical Committee

(1) Incidental mortality

Improved estimates of incidental fishing mortality are to be developed based upon direct fishery observations. The CTC will collate and document existing information on the coastwide encounter rates for all sources of incidental mortality on chinook coastwide. The CTC will report on the extent of incidental mortality and on deficiencies in the information coverage and will recommend a work plan to address data deficiencies, including observer programs or other direct sampling procedures, that will enable implementation of a total fishing mortality regime for fisheries in 2002. The Parties will implement the work plan in a timely and comprehensive manner to ensure adoption of a total fishing mortality regime in 2002.

The CTC will also evaluate the capacity to predict incidental mortalities, testing assumptions used in determining predictions and identifying options to improve pre-season predictions and estimates of total mortality in AABM and ISBM fisheries.

(2) Overage/Underage provisions

The CTC will adapt the previous overage/underage annex provisions to reflect changes based on:

- a) catch established through in-season or pre-season abundance indicators;
- b) adjustments for positive deviations from the total mortality index; and
- c) deviations from target reductions in ISBM fisheries. The CTC in carrying out this assignment will be guided by paragraph 7 of this Chapter.

The CTC will review a 7.5 percent management range above and below the management objective and consider whether increased flexibility in the management range is desirable or necessary, taking into consideration management precision, increased risk on affected stock groups and consistency with the objectives noted in paragraph 1 of this Chapter.

(3) Total fishing mortality

Consistent with paragraph 3 of this Chapter, the CTC will:

- a) specify standardized arrangements for all AABM regimes; and
- b) evaluate and identify fisheries where there is a consistent relation between the catch or harvest index and total mortality.

(4) In-season adjustments

Consistent with paragraph 5 of this Chapter, the CTC will evaluate any proposed in-season abundance predictors to determine if these provide reliable and consistent estimates of final abundance over using pre-season predictions.

(5) Model Improvements

The CTC will continue to review and improve the accuracy and precision of the CTC model, including among other things, determining the pre-season forecasts of the aggregate chinook abundance available to the fisheries.

(6) Escapement review

The CTC will evaluate and review existing escapement goals that fishery management agencies have set for chinook stocks subject to this Chapter for consistency with MSY or other agreed biologically-based escapement goals and, where needed, recommend goals for naturally spawning chinook stocks that are consistent with the intent of this Chapter.

(7) Lower escapement bound

For those stocks for which the escapement goals have been recommended by the CTC in accordance with paragraph 6 of this Appendix, the CTC will, prior to end of 2001, review and recommend for adoption to the Commission, criteria defining the lower bound of escapement for the purposes of taking additional management actions pursuant to paragraph 9 of this Chapter.

(8) Description of Technical Components of Chinook Chapter

Members of the CTC involved in the negotiation of this Chapter shall prepare by the autumn 1999 meeting of the Commission a document describing technical components of this Chapter. These components will include, but are not limited to, the following:

- i) a description of the abundance index, adult equivalent harvest rate index for catch used in the management of AABM fisheries;
- ii) methods for the derivation of the catches (including target harvest rate indices) specified in Table 1;
- iii) a description of the procedures associated with adjusting Table 1 in response to revised estimates of abundance and/or harvest rate indices;
- iv) a description of the non-ceiling index, anticipated values for each stock group under the general obligation of sub-paragraphs 4 (d) and (e);
- v) an example for paragraph 9 (weak stock gate), including an explanation for determination of criteria and stock groupings in Attachments I-V to this Chapter and how lower bounds for escapement goals are determined; and
- vi) a retrospective model run for the years 1985 through 1996 incorporating the provisions of this Chapter.

Appendix 5: Sustainable Salmon Fisheries Policy

Sustainable Salmon Fisheries Policy for the State of Alaska

The Alaska Department of Fish and Game and the Alaska Board of Fisheries

MARCH 23, 2000

Policy for the Management of Sustainable Salmon Fisheries.

- (a) The Alaska Board of Fisheries (board) and Alaska Department of Fish and Game (department) recognize that:
 - (1) while in aggregate Alaska's salmon fisheries are healthy and sustainable, due in large part to 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 or expanding fisheries.
 - (3) To effectively assure sustained yield and habitat protection from wild salmon stocks, fishery management plans and programs require specific guiding principles and criteria, and a framework for their application, as contained in this policy.
 - (4) The goal of this policy is to ensure conservation of salmon and their required marine and aquatic habitats, protection of customary and traditional uses and other uses, and the sustained economic health of Alaska's fishing communities.

- (a) Management of salmon fisheries by the State of Alaska should be based on the following principles and criteria:
 - (1) Wild salmon stocks and their habitats should be maintained at levels of resource productivity that assure sustained yields.
 - (A) Salmon spawning, rearing, and migratory habitats should be protected.
 - (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 their impacts on salmon populations should be conducted prior to approval of such proposals.
 - (iii) Adverse environmental impacts on wild salmon and their habitats should be assessed.
 - (iv) All essential salmon habitat in marine, estuarine and freshwater ecosystems should be protected, as should access of salmon to these habitats. 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 freshwater 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 stocks on wild stocks should be assessed; wild stocks and fisheries on them 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 current status of the habitat and effectiveness of the restoration activities.
 - (G) Depleted stocks should be allowed to recover or, where appropriate, shall be actively restored. Diversity should be maintained to the maximum extent possible, at the genetic, population, species, and ecosystem levels.
- (1) Fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning.
 - (A) Spawning escapements should be assessed both temporally and geographically; escapement monitoring programs should be appropriate to the scale, intensity and importance of each stock's use.
 - (B) Escapement goals, whether biological, optimal, or in-river run goals, should be established in a manner consistent with sustained yield. Unless otherwise directed the Alaska Department of Fish and Game (department) will manage Alaska's salmon fisheries, to the extent possible, for maximum sustained yield.
 - (C) Escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the stock measured.
 - (D) 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) Escapement and harvest management decisions should be made in a manner

consistent with protection of non-target stocks or species.

- (G) The role of salmon in ecosystem functioning should be evaluated and considered in harvest management decisions and in setting of escapement goals.
 - (H) Abundance trends of salmon should be monitored and considered in harvest management decisions.
- (1) Effective salmon management systems should be established and applied to regulate human activities that affect salmon.
- (A) Salmon management objectives should be appropriate to the scale and intensity of various uses and the biological capacities of target stocks.
 - (B) Management objectives should be provided in the form of harvest management plans, strategies, guiding principles, and policies (e.g., for mixed stock harvests, fish disease, genetics, and hatchery production) which are subject to periodic review.
 - (C) When wild Alaska salmon stocks are fully allocated, new or expanding fisheries should be restricted unless provided for by management plans or by application of the Board of Fisheries' allocation criteria.
 - (D) Management agencies should have clear authority (in statute and regulation) to control all sources of fishing mortality on salmon.
 - (E) Management agencies should have clear authority (in statute and regulation) to protect salmon habitats and control non-fishing sources of mortality.
 - (F) Management programs should be effective in controlling human-induced sources of fishing mortality, and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement.
 - (G) Management programs should be effective in protecting salmon habitats and controlling collateral mortality, and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement.
 - (H) Fisheries management implementation and outcomes should be consistent with regulations, regulations should be consistent with statutes, and the purpose of established policy and law should be effectively carried out.
 - (I) The board will recommend to the commissioner that effective joint research, assessment and management arrangements be developed with appropriate management agencies and bodies for stocks that cross state, federal, or international jurisdictional boundaries. The board shall recommend that appropriate procedures for effective monitoring, compliance, control, and enforcement be coordinated with those of other agencies, states, or nations.
 - (J) The board will work, within the limits of its authority, to assure management activities are accomplished in a timely and responsive fashion to implement objectives, based on the best available scientific information.
 - (K) The board will work, within the limits of its authority, to assure effective

mechanisms for the collection and dissemination of information and data necessary to carry out management activities are be developed, maintained and utilized.

- (L) The board will work, within the limits of its authority, to assure management programs and decision-making procedures are able to clearly distinguish and effectively deal with biological and allocation issues.
- (M) 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 fisheries principles.
- (N) Proposals for salmon fisheries development or expansion, and artificial propagation and enhancement, should include assessments required for sustainable management of existing fisheries and wild stocks.
- (O) 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 stocks.
- (P) The board will work with the commissioner and other agencies to develop effective processes for controlling excess fishing capacity.
- (Q) 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.
- (R) Conservation and management decisions for fisheries should take into account the best available information on biological, environmental, economic, social, and resource use factors.
- (S) Research and data collection should be undertaken in order to improve scientific and technical knowledge of salmon fisheries, including ecosystem interactions, status of populations, and the condition of salmon habitats.
- (T) The best available scientific information on the status of populations and the condition of their habitats should be routinely updated and peer reviewed.
- (1) Public support and involvement for sustained use and protection of salmon resources shall be sought and encouraged.
 - (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 fashion.
 - (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 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 stocks where there are known conservation problems, the burden of conservation shall be shared among all fisheries in close proportion to their respective use, consistent with state and federal law, as above.

- (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, value of salmon and habitat to the public and ecosystem (fish and wildlife), natural variability and population dynamics, status of fish stocks and fisheries, and the regulatory process.
- (1) In the face of uncertainty, salmon stocks, fisheries, artificial propagation and essential habitats shall be managed conservatively.
 - (A) A precautionary approach, involving the application of prudent foresight, taking account of the uncertainties in 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:
 - a) consideration of the needs of future generations and avoidance of changes that are potentially not reversible;
 - b) prior identification of undesirable outcomes and of measures that will avoid them or correct them promptly;
 - c) that any necessary corrective measures are initiated without delay, and that they should achieve their purpose promptly, on a time scale not exceeding five years, which is roughly equivalent to the generation time of most salmon species;
 - d) 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;
 - e) appropriate placement of the burden of proof, onto those plans or ongoing activities that pose a risk or hazard to salmon habitat or production, by adhering to the requirements above.
 - (B) A precautionary approach should be applied to the regulation of activities that affect essential salmon habitat
- (a) The principles and criteria for sustainable salmon fisheries shall be applied, using the best available information, by the department and the board as follows:
 - (1) At regular meetings of the Board of Fisheries, the department shall provide the Board with a report on the status of salmon stocks and salmon fisheries under consideration for regulatory change, which should include:
 - (A) A stock-by-stock assessment of the extent to which the management of stocks and

fisheries is consistent with the principles and criteria contained in this policy,

- (B) Description of habitat status and any habitat concerns,
 - (C) Identification of healthy stocks and sustainable salmon fisheries,
 - (D) Identification of any existing escapement goals, or management actions needed to achieve these goals, that may have allocative consequences,
 - (E) Identification of new or expanding fisheries,
 - (F) Identification of any salmon stocks, or populations within stocks, that present a concern related to yield, management, or conservation, and
 - (G) Description of management and research options to address stock or habitat concerns.
- (1) In response to the department's stock status reports, reports from other resource agencies, and public input, the board shall review the management plan, or consider developing a management plan, for each affected fishery or stock. Management plans will be based upon 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 incorporate the best available scientific information,
 - (B) Minimize the adverse effects on habitat caused by fishing,
 - (C) Protect, restore, and promote the long term health and sustainability of the fishery and fish habitat,
 - (D) Prevent overfishing, and
 - (E) Provide conservation and management measures that are necessary and appropriate to promote maximum or optimum sustainable use of the fishery resource.
- (1) In the course of review of the stock status reports and management plans described in (c)(1) and (2), the board, in consultation with the department, shall determine if any new or expanding fisheries, stock yield concerns, stock management concerns, or stock conservation concerns exist. If so, the board shall, as appropriate, amend or develop 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 fisheries through yield concerns, management concerns, and conservation concerns.
- (2) In association with the appropriate management plan, the department and the board shall, as appropriate, collaborate in the development and periodic review of an action plan for any new or expanding fisheries, or stocks of concern. Action plans should contain goals, measurable and implementable objectives, and provisions, including but not limited to:
- (A) Measures required to restore and protect habitat, including necessary coordination with other agencies and organizations,

- (B) Identification of stock or population rebuilding goals and objectives,
 - (C) Management actions for applicable fisheries needed to achieve rebuilding goals and objectives, in proportion to each fishery's use of and hazard posed to a stock,
 - (D) Description of the new or expanding fisheries, management concern, yield concern, or conservation concern, and
 - (E) Performance measures appropriate for monitoring and gauging effectiveness of the action plan, which are derived from the principles and criteria contained in this policy
- (5) Each action plan shall include a research plan as necessary to provide information to address concerns. Research needs and priorities will be evaluated periodically, based on effectiveness monitoring described above.
 - (6) Where actions needed to regulate human activities affecting salmon and their habitat 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, commissioners, and chairs of appropriate legislative committees, to describe the issue and recommend appropriate action.
 - (7) Nothing in this policy is intended to expand, reduce, or be inconsistent with, the statutory regulatory authority of the Board of Fisheries, the department, or other state agencies with regulatory authority that impacts the fishery resources of the state.
- (a) In implementing this policy, the following definitions apply:
 - (1) Allocation: the granting of specific harvest privileges, usually by regulation, among or between various user groups. Allocations may take the form of quotas, time periods, area, percentage sharing of stocks, or some other explicit management measure either providing or limiting harvest opportunity.
 - (2) Allocation criteria: the factors set out in AS 16.05.251(e) considered by the Board of Fisheries as appropriate to particular allocation decisions.
 - (3) Biological escapement goal (BEG): escapement that provides the greatest potential for maximum sustained yield. A BEG will be the primary management objective for the escapement unless an Optimal Escapement or In-River Run Goal has been adopted. A BEG will be developed from the best available biological information, and should be scientifically defensible on the basis of available biological information. A BEG will be determined by the Department of Fish and Game and will be expressed as a range based on factors such as stock productivity and data uncertainty. The department will seek to maintain escapements evenly within the bounds of a BEG.
 - (4) Burden of conservation: 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 stock or group of stocks. This burden, in absence of a fishery management plan, will be generally applied to users in close proportion to their respective harvest of the stock.

- (5) Conservation concern: a 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). "Chronic inability" means the continuing or anticipated inability to meet escapement thresholds over a four to five year period, which is roughly equivalent to the generation time of most salmon species. A conservation concern is more severe than a management concern, which refers to a stock that fails to consistently achieve sustainable escapement, biological escapement, or optimal escapement goals.
- (6) Depleted stock: a stock for which there is a conservation concern.
- (7) Diversity: in a biological context, the range of variation exhibited within any level of organization, such as among genotypes within a population, among populations within a stock, among stocks within a species, among species within a community, or among communities within an ecosystem.
- (8) Enhanced stock: a stock of fish that is undergoing specific manipulation (such as hatchery augmentation, lake fertilization, etc.) to enhance its productivity above the level that would naturally occur. An enhanced stock can be either an introduced stock, where no wild stock had occurred before, or a wild stock undergoing such manipulation, but is distinguished from a stock undergoing rehabilitation, which is intended to restore a stock's productivity to a higher natural level.
- (9) Escapement: annual estimated size of the spawning stock. Quality of the escapement may be judged 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 spawning habitat.
- (10) Expanding fishery: a fishery in which effective harvesting effort has recently increased significantly beyond historical levels and where the increase has not resulted from natural fluctuations in fish abundance.
- (11) Genetic: refers to those characteristics (genotypic) of an individual or group of fish that are expressed genetically (such as allele frequencies or other genetic markers).
- (12) Habitat concern: degradation of salmon habitat that results in, or can be anticipated to result in, impacts leading to yield, management, or conservation concerns.
- (13) Harvest rate: the proportion of a stock's entire annual run that is harvested, either by all fisheries combined or fishery-by-fishery; "harvest rate" is distinct from stock composition.
- (14) Harvestable surplus: the number of fish from a stock's annual run that is surplus to escapement needs and can reasonably be made available for harvest.
- (15) Healthy stock: a stock of fish that has annual runs typically of a size to meet escapement goals and a potential harvestable surplus to support optimum, or maximum sustained yield.
- (16) Incidental harvest: the harvest of fish, or other species, that is captured in addition to the target species of a fishery.
- (17) Incidental mortality: mortality imposed on a stock outside of directed fishing; that

mortality caused by incidental harvests, interaction with fishing gear, habitat degradation, and other human-related activities.

- (18) In-river run goal: a specific management objective for stocks that are subject to harvest upstream of the point where escapement is estimated. The in-river run goal will be set and placed into regulation by the Alaska Board of Fisheries and is comprised of the SEG, BEG or OEG plus specific allocations to in-river fisheries.
- (19) Introduced stock: a stock of fish that has been introduced to an area, or portion of an area, where that stock had not previously occurred. An introduced stock may undergo continuing enhancement or one that is left to sustain itself with no additional manipulation.
- (20) Management concern: a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a stock within the bounds of the SEG, BEG, OEG, or other specified management objectives for the fishery. "Chronic inability" means the continuing or anticipated inability to meet escapement objectives over a four to five year period, which is roughly equivalent to the generation time of most salmon species. A management concern is not as severe as a conservation concern, which refers to a stock that fails to consistently meet its sustained escapement threshold (SET).
- (21) Maximum sustained yield (MSY): greatest average annual yield from a stock. In practice, MSY is approached 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 escapement and subsequent return. The concept of maximum sustained yield 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.
- (22) Mixed stock fishery: a fishery that harvests fish from a mixture of stocks.
- (23) New fishery: a fishery in which either 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.
- (24) Optimal escapement goal (OEG): a specific management objective for escapement that considers biological and allocative factors and may differ from the SEG or BEG. The OEG will be sustainable and may be expressed as a range with the lower bound above the level of SET, and will be placed into regulation by the Alaska Board of Fisheries. The department will seek to maintain escapements evenly within the bounds of the OEG.
- (25) Optimum sustained yield (OSY): an average annual yield from a stock considered to be optimal in achieving a specific management objective other than maximum yield (e.g., achievement of a consistent level of sustained yield, protection a less abundant or less productive 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).
- (26) Overfishing: a level of fishing on a stock that results in a conservation or management concern.

- (27) Phenotypic characteristics: those characteristics of an individual or group of fish that are expressed physically (such as body size, length at age, etc.).
- (28) Population: a locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics; can comprise an entire stock or be a component portion of a stock; the smallest uniquely identifiable spawning aggregation of genetically similar salmon used for monitoring purposes.
- (29) Rehabilitation: efforts applied to a stock to restore it to an otherwise natural level of productivity. Distinguished from enhancement, which is intended to augment production above otherwise natural levels.
- (30) Return: the total number of salmon in a stock from a single brood (spawning) year surviving to adulthood. Due to the varying ages of salmon adults returning to spawn (except for pink salmon), the total return from a brood year will occur over several calendar years. The total return generally includes those mature fish from a single brood year that are harvested in fisheries plus those that compose the stock's spawning escapement. Distinct from run, which is the number of mature salmon in a stock during a single calendar year.
- (31) Run: 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 fish plus the escapement. The annual run in any calendar year is composed of several age classes of mature fish (except for pink salmon) from the stock, derived from the spawning of a number of previous brood years.
- (32) Salmon: for this policy, salmon includes any of the following five wild anadromous semelparous Pacific salmon species (*Oncorhynchus sp.* exclusive of steelhead and cutthroat trout) native to Alaska: chinook or king (*Oncorhynchus tshawytscha*), sockeye or red (*O. nerka*), coho or silver (*O. kisutch*), pink or humpback (*O. gorbuscha*), and chum or dog (*O. keta*).
- (33) Stock: a locally interbreeding group of salmon which 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.
- (34) Stock composition: the proportional contribution of various stocks to the total harvest of a fishery. For a particular stock, the percentage of the total harvest of a fishery composed of fish from that stock. This is distinct from harvest rate.
- (35) Stock of concern: refers to a stock of salmon for which there is a yield, management or conservation concern. Levels of concern grade from less to more severe from yield, through management, to conservation concerns.
- (36) Sustainable escapement goal (SEG): A level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yields 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 In-River 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 of Fish and Game 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 fishery: A 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) Sustainable yield: average annual yield that results from a level of escapement that can be maintained on a continuing basis. A wide range of average annual yield levels is sustainable; likewise, a wide range of annual escapement levels can produce sustainable yields.
- (39) Sustained escapement threshold (SET): a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. In practice, SET can be estimated based on lower ranges of historical escapement levels, for which the stock has consistently demonstrated the ability to sustain itself. The SET is lower than the lower bound of the BEG, and/or lower than the lower bound of the SEG. The SET is established by the department in consultation with the board, as needed, for stocks of management or conservation concern.
- (40) Target species: the main, or several major, species of interest toward which a fishery directs its harvest.
- (41) Yield: the number (or weight) of fish harvested in a particular year or season from a stock.
- (42) Yield concern: 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. "Chronic inability" refers to the continuing or anticipated inability to meet expected yields over a four to five year period, which is roughly equivalent to the generation time of most salmon species. "Expected yields" refers to levels at or near the lower range of recent historic harvests if they are deemed sustainable. A yield concern is less severe than a management concern, which refers to a stock that fails to consistently achieve biological escapement or optimal escapement goals.
- (43) Wild stock: a stock of salmon that originated in a specific location under natural conditions. It is distinct from an introduced stock, although some introduced stocks may come to be considered "wild" if they are self-sustaining for a long period of time. Wild stocks can also become enhanced or be rehabilitated, if their productivity is augmented by supplemental means (e.g., lake fertilization, rehabilitative stocking, etc.).