# Alaska Responsible Fishery Management Certification

# 2nd Surveillance Report

***For The***

## US Alaska Salmon Commercial Fisheries

***Facilitated by***

## Alaska Seafood Marketing Institute (ASMI)

***And***

## Alaska Fisheries Development Foundation


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# Foreword

The Alaska Responsible Fisheries Management (RFM) Standard Version 1.3 is composed of Conformance Criteria and is based on the 1995 FAO Code of Conduct for Responsible Fisheries and the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009. The Standard also includes full reference to the 2011 FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Inland Fisheries which in turn are now supported by a suite of guidelines and support documents published by the UN FAO. Further information on the Alaska RFM program may be found here: http://www.alaskaseafood.org/rfm-certification/certified-fisheries


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# Glossary

| | |
|---|---|
| ABC | Allowable Biological Catch |
| AC | Advisory Committee |
| ACC | Alaska Administrative Code |
| ADFG | Alaska Department of Fish and Game |
| AFA | American Fisheries Act |
| AFDF | Alaska Fisheries Development Foundation |
| AFSC | Alaska Fisheries Science Center |
| AS | Alaska Statue |
| ASMI | Alaska Seafood Marketing Institute |
| AWT | Alaska Wildlife Troopers |
| AYK | Artic Yukon Kuskokwim |
| BC | British Columbia |
| BEG | Biological Escapement Goal |
| BOF | Board of Fisheries |
| BSAI | Bering Sea and Aleutian Islands |
| CCRF | Code of Conduct for Responsible Fisheries |
| CIAA | Cooke Inlet Aquaculture Association |
| CMA | Chignik Management Area |
| CDQ | Community Development Quota |
| CFEC | Commercial Fisheries Entry Commission |
| COAR | Commercial Operators Annual Report |
| CPUE | Catch per Unit Effort |
| CWCS | Comprehensive Wildlife Conservation Strategy |
| CWT | Coded Wire Tags |
| DEC | Department of Environmental Conservation |
| DIPAC | Douglas Island Pink and Chum Inc. |
| DNR | Department Natural Resources |
| EIS | Environmental Impact Statement |
| EEZ | Exclusive Economic Zone |
| EFH | Essential Fish Habitat |
| ESA | Endangered Species Act |
| FAO | Food and Agriculture Organization of United Nations |
| FDA | Food Drugs Administration |
| FMP | Fishery Management Plan |
| FSB | Federal Subsistence Board |
| GOA | Gulf of Alaska |
| GHL | Guideline Harvest Level |
| HAPC | Habitat Area of Particular Concern |
| HCD | Habitat Conservation Division |
| IFQ | Individual Fishing Quota |
| IJC | International Joint Commission |
| IMS | Institute of Marine Sciences |
| IRFA | Initial Regulatory Flexibility Analysis |
| IRIU | Improved Retention/Improved Utilization |
| IUCN | International Union of Conservation of Nature |

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| | |
|---|---|
| IUU | Illegal Unreported and Unregulated |
| MMPA | Marine Mammal Protection Act |
| MOU | Memorandum of Understanding |
| MSFCMA | Magnuson-Stevens Fisheries Management and Conservation Act |
| MRA | Maximum retainable allowances |
| MT | Metric tons |
| MSY | Maximum Sustainable Yield |
| Ne | Effective Population |
| NEPA | National Environmental Policy Act |
| NGO | Non-governmental Organization |
| NIH | US National Institute of Health |
| nm | Nautical miles |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| NPFMC | North Pacific Fishery Management Council |
| NPRB | North Pacific Research Board |
| NRSEAA | Northern Southeast Aquaculture Association |
| OEG | Optimal Escapement Goal |
| OFL | Overfishing Level |
| OLE | Office for Law Enforcement |
| OY | Optimum Yield |
| PAR | Permit Alteration Request |
| PNP | Private Non Profit |
| PSMFC | Pacific States Marine Fisheries Commission |
| PSC | Pacific Salmon Commission |
| PSC | Prohibited Species Catch |
| PWS | Prince William Sound |
| PWSAC | Prince William Sound Aquaculture Center |
| PWSS | Prince William Sound Science Center |
| RAC | Regional Advisory Council |
| RACE | Resource Assessment and Conservation Engineering |
| REFM | Resource Ecology and Fisheries Management |
| RFM | Responsible Fisheries Management |
| SAFE | Stock Assessment and Fishery Evaluation (Report) |
| SEAK | Southeast Alaska |
| SEG | Sustainable Escapement Goal |
| SET | Sustained Escapement Threshold |
| SOC | Stocks of Concern |
| SSC | Scientific and Statistical Committee |
| SSL | Steller Sea Lion |
| SSSC | Sitka Sound Science Center |
| TAC | Total Allowable Catch |
| UCI | Upper Cook Inlet |
| USCG | U.S. Coast Guard |
| USDA | US Department of Agriculture |
| USFWS | US Fish and Wildlife |
| VFDA | Valdes Fisheries Development Association |
| YRP | Yukon River Panel |

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# Summary and Recommendations

This report is the 2nd Surveillance Report AK/SAL/002.2/2018 for the Alaska Salmon Commercial Fishery produced on behalf of the Alaska Fisheries Development Foundation according to the Alaska Responsible Fisheries Management (RFM) Certification Program. The fisheries were originally certified on 11th March 2011, and recertified in 9th March 2017.

The objective of this Surveillance Report is to monitor for, and evaluate the impacts of, any changes to the management regime, regulations and their implementation since the previous assessment. Having assessed these changes to the fishery (if any) the Assessment Team determines if these changes materially affect the fisheries' conformance to the AKRFM Standard and whether current practices remain consistent with the overall confidence ratings assigned during either initial certification or subsequent surveillance audits where the original confidence rating(s) have been changed.

In addition to this, any areas reported as "items for surveillance" or corrective action plans in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. No non-conformances were identified since certification was granted.

The certification covers the United States Alaska commercial salmon [all Pacific salmon species: Chinook *Oncorhynchus tschawytscha*, sockeye *O. nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*] fisheriesemploy troll, purse seine, drift gillnet, beach seine, set gillnet and fish wheel (Upper Yukon River only) gear in the four administrative Regions of Alaska that are principally managed by the Alaska Department of Fish and Game (ADFG). While certification covers the entire Alaska Exclusive Economic Zone (EEZ), most of the harvest is taken in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.

The surveillance assessment was conducted according to the Global Trust Certification procedures for Alaska Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria (v1.3) fundamental clauses as the assessment framework.

The assessment was conducted by a team of Global Trust appointed Assessors comprising of three externally contracted fishery experts and Global Trust internal staff. Details of the assessment team are provided in Appendix 1.

The main Key outcomes have been summarized in Section 5 "Assessment Outcome Summary".

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## Assessment Team Details

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# 1. Introduction

This Surveillance Report documents the 2nd Surveillance Assessment of the Alaska Salmon Commercial fishery originally certified on 11th March 2011, and recertified in 9th March 2017 and presents the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

**Unit of Certification**
The unit of certification covers the United States Alaska commercial salmon [all Pacific salmon species: Chinook *Oncorhynchus tschawytscha*, sockeye *O. nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*] fisheries, employ troll, purse seine, drift gillnet, beach seine, set gillnet and fish wheel (Upper Yukon River only) gear in the four administrative Regions of Alaska that are principally managed by the Alaska Department of Fish and Game (ADFG). While certification covers the entire Alaska Exclusive Economic Zone (EEZ), most of the harvest is taken in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.

This Surveillance Report documents the assessment results for the continued certification of commercially exploited Alaska Salmon Commercial fisheries to the Alaska RFM Certification Program. This is a voluntary program that has been supported by Alaska Seafood Marketing Institute (ASMI) who wish to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed.

The assessment was conducted according to the Global Trust procedures for Alaska RFM Certification using the fundamental clauses of the Alaska RFM Conformance Criteria Version (v1.3) in accordance with ISO 17065 accredited certification procedures.

The assessment is based on 6 major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labelling of products from marine capture fisheries (2009); including:

**A.** **The Fisheries Management System**
**B.** **Science and Stock Assessment Activities**
**C.** **The Precautionary Approach**
**D.** **Management Measures**
**E.** **Implementation, Monitoring and Control**
**F.** **Serious Impacts of the Fishery on the Ecosystem**

These six major components are supported by 12 fundamental clauses (+ 1 in case of enhanced fisheries) that guide the FAO-Based RFM Certification Program surveillance assessment.

A summary of the site meetings is presented in Section 5. Assessors included both externally contracted fishery experts and Global Trust internal staff (Appendix 1).

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## 1.1. Recommendation of the Assessment Team

**Following this 2ndt Surveillance Assessment, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program be maintained for the management system of the applicant fisheries, The United States Alaska commercial salmon [all Pacific salmon species: Chinook *Oncorhynchus tschawytscha*, sockeye *O. nerka,* coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*] fisheries employ troll, purse seine, drift gillnet, beach seine, set gillnet and fish wheel (Upper Yukon River only) gear in the four administrative Regions of Alaska that are principally managed by the Alaska Department of Fish and Game (ADFG). While certification covers the entire Alaska Exclusive Economic Zone (EEZ), most of the harvest is taken in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.**


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## 2. Fishery Applicant Details

| Applicant Contact Information | | | |
|---|---|---|---|
| **Organization/ Company Name:** | **Alaska Fisheries Development Foundation** | **Date:** | **June 2017** |
| **Correspondence Address:** | **P.O. Box 2223, Wrangell, AK 99929-2223** | | |
| **Street :** | | | |
| **City :** | **Wrangell** | | |
| **State:** | **Alaska** | | |
| **Country:** | **USA** | | |
| **Phone:** | **907- 305-0586** | **E-mail Address:** | jdecker@afdf.org |
| **Key Management Contact Information** | | | |
| **Full Name:** | *(Last)* **Decker** | *(First)* **Julie** | |
| **Position:** | ***Director*** | | |
| **Correspondence address** | **P.O. Box 2223, Wrangell, AK 99929-2223** | | |
| **E-mail Address:** | **jdecker@afdf.org** | | |


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## 3. Unit of Certification

| Unit of Certification | | | |
|---|---|---|---|
| **US ALASKA COMMERCIAL SALMON FISHERIES** | | | |
| **Fish Species (Common & Scientific Name)** | **Geographical Location of Fishery** | **Gear Type** | **Principal Management Authority** |
| Chinook salmon *O.tschawytscha*<br>Sockeye salmon *O.nerka*<br>Coho salmon *O. kisutch*<br>Pink salmon *O. gorbuscha*<br>Chum salmon *O. keta* | ADFG Admin Region 1: Southeast & Yakutat | ▪ Troll<br>▪ Purse Seine<br>▪ Drift Gillnet<br>▪ Set Gillnet | ADFG |
| Chinook salmon *O.tschawytscha*<br>Sockeye salmon *O.nerka*<br>Coho salmon *O. kisutch*<br>Pink salmon *O. gorbuscha*<br>Chum salmon *O. keta* | ADFG Admin Region 2: Central: Prince William Sound, Upper Cook Inlet, Lower Cook Inlet, Bristol Bay | ▪ Purse Seine<br>▪ Drift Gillnet<br>▪ Set Gillnet | ADFG |
| Chinook salmon *O.tschawytscha*<br>Sockeye salmon *O.nerka*<br>Coho salmon *O. kisutch*<br>Pink salmon *O. gorbuscha*<br>Chum salmon *O. keta* | ADFG Admin Region 3: Arctic-Yukon-Kuskokwim: Kuskokwim, Yukon, Norton Sound, Kotzebue | ▪ Drift Gillnet<br>▪ Set Gillnet<br>▪ Fish wheel<br>▪ Beach seine<br>▪ Dip net | ADFG |
| Chinook salmon *O.tschawytscha*<br>Sockeye salmon *O.nerka*<br>Coho salmon *O. kisutch*<br>Pink salmon *O. gorbuscha*<br>Chum salmon *O. keta* | ADFG Admin Region 4: Kodiak, Chignik, Alaska Peninsula, Aleutian Islands | ▪ Purse Seine<br>▪ Drift Gillnet<br>▪ Set Gillnet<br>▪ Beach Seine | ADFG |


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## 4. Surveillance Meetings

| City/Date /Time | Attendants | Location |
|---|---|---|
| **Kodiak** | **KRAA**<br>*In Person* Tina Fairbanks, Trent Dodson, Oliver Holm, Harvey Goodel | **Kodiak Regional Aquaculture Association (KRAA) Office.** |
| 12/12/17 | **AFDF**<br>*In Person* Dave Gaudet | |
| 9:00 AM | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 1:15 PM | **ADFG Westward Region Kodiak**<br>In Person, Nick Sagalkin, Jeff Wadle, Ken Schaberg (ADFG) | **ADFG Kodiak Office** |
| | **AFDF**<br>*In Person* Dave Gaudet | |
| | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee, Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| **Anchorage** | **ADFG**<br>In person, Andrew Munro(ADFG)<br>Chris Habicht (ADFG) | **ADF&G**<br>**333 Raspberry Rd** |
| 12/13/17 | **AFDF**<br>*In Person* Dave Gaudet | |
| 8:00 Am | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 1:30PM | **ADFG Prince William Sound**<br>In person, Bert Lewis(ADFG), Mike Wells(ADFG)<br>Charlie Russell(ADFG)<br>*Remote:* Casey Campbell (PWSAC**)** | **ADF&G**<br>**333 Raspberry Rd** |
| | **AFDF**<br>*In Person* Dave Gaudet | |
| | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 3:30 PM | **Alaska Wildlife Troopers**<br>*In person,* Lt Steven Hall | **AWT Office** |

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| | | |
|---|---|---|
| | **AFDF**<br>*In Person*<br>Dave Gaudet | |
| | **SAIG**<br>In Person Dr Ivan Mateo,Dr Brian Allee, Scott Marshall, Marc Johnson | |
| **Juneau** | **ADFG Headquarters**<br>In person, Scott Kelley(ADFG), Lowell Fair (ADFG)<br>Ed Jones (ADFG) | 1255 W 8th St, Juneau, AK 99802 |
| 12/14/17 | **AFDF**<br>*In Person* Dave Gaudet | |
| 8:30 AM | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 1:15 PM | **Douglas Island Pink and Chum Inc. (DIPAC)**<br>In Person Adam Zaleski (DIPAC), Ian Fisk(DIPAC) | 2697 Channel Dr, Juneau, AK<br><br>99801 |
| | **AFDF**<br>*In Person* Dave Gaudet | |
| | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 3:30 PM | **NOAA Fisheries Ted Stevens Marine Research Institute**<br>In Person James Murphy (NOAA), Chuck Guthry (NOAA),<br>Jordan Watson(NOAA), Chris Kondzela (NOAA) | Lena Loop Juneau |
| | **AFDF**<br>*In Person* Dave Gaudet | |
| | **SAIG**<br>*In Person* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson<br>(Remote Audit) | |
| 1/31/18 | **ADFG Arctic/Yukon/Kuskokwim Region**<br>Conference call<br>Kathy Howard(ADFG), John Linderman (ADFG) | |
| 10:00 AM | **AFDF**<br>**Conference call**<br>Dave Gaudet | |
| | **SAIG**<br>*Conference call* Dr Ivan Mateo,Dr Brian Allee,<br>Scott Marshall, Dr. Marc Johnson | |

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# 5. Assessment Outcome Summary

## 5.1. Fundamental Clauses Summaries

**Fundamental Clause 1: Structured and legally mandated management system**

**Evidence adequacy rating: HIGH**

Alaska's commercial salmon fisheries are managed in accordance with a transparent structure of laws, regulations, treaties, and other legal mandates at the international, national, and local (state) levels. Alaska's state Constitution and the Magnuson-Stevens Act Fisheries Management Conservation Act (MSFMCA) provide broad policy guidance codified by state laws and regulations that structure the Alaska commercial salmon fishery. Salmon management in Alaska necessarily considers the whole stock over its entire area of distribution, as the primary management goal is to maintain adult escapement at levels that support viable populations and sustained yield, as influenced by survivorship at all life stages. Management measures also consider past and existing agreements, including those designed to coordinate with neighbouring states in cases of transboundary management. Alaska Department of Fish and Game (ADFG) and Federal management representatives (National Oceanic and Atmospheric Administration NOAA) participate within international and multistate organizations, such as the Pacific Salmon Council (PSC), the Pacific States Marine Fisheries Commission (PSMFC) and the North Pacific Anadromous Fish Commission (NPAFC), to effectively coordinate and develop salmon conservation and management throughout the species' range. These organizations are supported through national and international agreements and funding from participant states. Together with the Board of Fisheries (BoF), ADFG adapts management of the commercial salmon fishery in a transparent manner that considers adult escapement, population productivity, and viability. Every three years each Alaska management region updates its escapement information and submits a salmon stock status report to the BoF. This report (mandated in Alaska's Policy for the Management of Sustainable Salmon Fisheries) reviews the status of all stocks within each management area, recommends escapement goals based on the past three years' data, identifies stocks of concern, and develops management and action plans to address relevant issues. Management measures, regulations and the regulatory process are developed and organized in a very transparent manner that allows opportunity for public engagement and review.

**Fundamental Clause 2: Coastal area management frameworks**

**Evidence adequacy rating: HIGH**

The salmon fishery management organizations in Alaska (principally ADFG and NOAA) participate in coastal area management-related institutional frameworks processes that safeguard biological species and their habitats. These frameworks include decision-making processes and activities relevant to the fishery resource and its users that support sustainable and integrated use of living marine resources, and limit or avoid conflict among users. ADFG is responsible for the protection, management, conservation, and restoration of Alaska's fish and game resources. The Board of Fisheries (BoF) is responsible for considering and adopting regulations to allocate resources among user groups; establishing fish reserves and conservation areas, fishing seasons, quotas, bag limits and size restrictions; habitat protection; stock enhancement; and developing commercial, subsistence, sport and personal use fisheries. All fishery management plans include a description and identification of Essential Fish Habitat (EFH), adverse impacts, and actions to conserve and enhance habitat. Finally, NOAA Fisheries' Habitat Conservation Division (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on EFH and living marine resources in Alaska.

Multi-state and international organizations, such as NPFAC, PSC, PFMSC, develop and provide mechanisms that promote coordinated conservation and management plans and actions relevant to Alaskan commercial salmon fisheries. Representatives from fishery management organizations and fishing communities participate in coastal area management planning through the federal National Environmental Policy Act (NEPA) processes. This includes

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decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users.

The BoF process, which establishes gear types and seasons for Alaska's commercial salmon fisheries and provides a forum for public hearings, also serves to provide a forum for fishery conflict resolution. Fisheries regulations are made available through diverse public fora, publications and online resources. The Alaska Commercial Fisheries Entry Commission (CFEC) helps conserve and maintain the economic health of Alaska's commercial salmon fisheries by structuring and managing the limited entry program that restricts the number of participants in these fisheries. ADFG actively collaborates with federal, state and international agencies and institutions in diverse research and monitoring programs that assess physical, chemical, biological, economic and social parameters associated with Alaskan salmon fisheries. Findings from this research are regularly published in technical reports, scientific literature and online. Finally, because numerous salmon-bearing rivers in southeast Alaska are transboundary with Canada, Alaska State, U.S. federal and Canadian agencies, as well as tribal (i.e. First Nations) governments cooperatively participate in planning and decision-making processes that affect salmon, their habitats and reliant fisheries.

**Fundamental Clause 3: Management objectives and plan**
**Evidence adequacy rating: HIGH**

The principal role of the Board of Fisheries (BoF) is to conserve and develop the fishery resources of Alaska. The Board achieves its mission in part by setting seasons and regulations for the state's subsistence, commercial, sport, guided sport, and personal use fisheries. The BoF also establishes policy and provides management direction for the state's commercial salmon fishery resources. The BoF is charged with making allocative decisions, and ADFG is responsible for management based on those decisions. General precepts are established by the BoF and incorporated into regulation. Alaska has successfully managed sustained yield of its salmon fisheries since implementation of the limited entry permit system in 1973. While the BoF and ADFG continue to set and adjust biologically-based escapement goals to conserve Alaska's salmon stocks, the limited entry permitting process of the CFEC serves to safeguard the economic viability of the dependent fisheries. The BoF develops regulation proposals, evaluate proposals, debates conservation, advises regional councils and consults with interested parties – providing opportunity for input from all interested parties and prioritizing subsistence uses of salmon in Alaska.

Conservation of the biodiversity of aquatic habitats and ecosystems is the responsibility of Habitat Division within ADFG. The Policy for the Management of Sustainable Salmon Fisheries directs ADFG to provide the BoF with reports on the status of salmon stocks and identify any stock that presents a concern. In consultation with ADFG, the BoF may designate, amend, or discontinue Stocks of Concern. Alaska's Policy for the Management of Sustainable Salmon Fisheries provides explicit protection for essential habitats of salmon, including freshwater spawning, estuarine and marine habitats. This policy also provides direction for salmon fishery enhancement, restricting the use of hatchery supplementation to levels that minimize adverse impacts to naturally spawning salmon populations and the function of aquatic ecosystems.

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**Fundamental Clause 4: Fishery data**
**Evidence adequacy rating: HIGH**
ADFG maintains programs at the area, regional and state-wide levels to collect harvest statistics. In commercial fisheries, a record of the transaction each time fish are sold is mandated by a state statute (AS 16.05.690 Record of Purchase) that includes species, areas fished, number and weight of fish sold. In sport fisheries, creel surveys are used when required for in-season management purposes. A state-wide survey of recreational anglers provides an annual estimate of the number, by species, caught and retained in each area (Clark 2009). Household surveys and/or numbers recorded on permits are used for subsistence and personal use fisheries. The number of fish caught in groundfish fisheries is obtained by on-board observers (NPFMC 2014). Catch sampling to determine age, sex and size composition is routinely conducted state-wide. The stock composition of catches in many mixed stock fisheries is determined with a variety of methods including genetic analysis, scale pattern analysis, otolith analysis, and coded micro-wire tags Marshall et al (1987), Guthrie et al (2016). Data collected is shared with relevant federal and international organizations (see for example PSC Chinook Tech. Comm. 2015), and various reports with this information are available to the public.

**Fundamental Clause 5: Stock assessment**
**Evidence adequacy rating: HIGH**
ADFG has established a strong hierarchal structure of professional managers, researchers and biometrics staff to support management at the local level. The core research and management functions are conducted by professional staff deployed to 23 area offices located throughout the state. Overarching the area office structure, are four specialized Divisions within the Department that have responsibilities for fisheries issues. The Commercial Fish Division has the primary responsibility for research and management of stocks that are harvested commercially and for personal use. Within each Division, administrative regions were established. Staff at the regional offices provide administrative, biometric, computer hardware and software, research and management support to the area office staff. At the Division level, senior staff provide overall guidance to the regional staff in management, research and biometrics as well as providing statewide technical services, such as the Gene Conservation Laboratory. At the core of the ADFG's scientific program is a requirement for peer reviewed planning. Scientific research and applied stock assessment activities undertaken is rigorously reviewed at the area and regional level, and may also be reviewed at the headquarters level to ensure relevance to management, and scientific rigor (Regnart and Swanton 2012). Examples of stock assessment operational plans are Richards et al. (2013) and Bernard and Jones (2010). Each year, the area management staff prepares a detailed report on the results of harvest, effort and escapements and other stock assessment activities undertaken in their area (see for example Shields and Dupuis 2015. The quality, quantity and relevance of ADFG's reports publications is outstanding. ADFG's efforts are supported by federal research https://www.afsc.noaa.gov/abl/default.php and graduate level research at educational institutions https://www.uaf.edu/cfos/about-us/locations/juneau/

**Fundamental Clause 6: Biological reference points and harvest control rule**
**Evidence adequacy rating: HIGH**
Escapement goals are the primary reference points for Alaska salmon management. The Policy for State-wide Salmon Escapement Goals (5AAC 39.223) defines the types of escapements goals that may be established and the role of the ADFG and Board of Fisheries in setting and reviewing goals. ADFG sets one of three types of escapement goals depending upon the type and quality of the available data:

1. A Biological Escapement Goal (BEG) is defined as an escapement range that provides the greatest potential for maximum sustained yield.

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2. A Sustainable Escapement Goal (SEG) is defined as a level of escapement, indicated by an index or a range of escapement estimates; that is known to have provided for sustained yield over a 5 to 10 year period.

3. A Sustained Escapement Threshold (SET) is defined as a threshold level of escapement below which the ability of the salmon stock to sustain itself is jeopardized.

Escapement goals for a management area are reviewed every three years (see for example Erickson et al. 2015). Details about how escapements were determined each year are typically provided in annual management report (see for example Wilburn and Stump 2006). Each year ADFG publishes a summary of adopted escapement goals and a 10-year history of performance in meeting these goals (Munro and Volk 2015).

**Fundamental Clause 7: Precautionary approach**
**Evidence adequacy rating: HIGH**

Alaska State Regulation, the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222 (a) (1); (a) (5) (A, B),) codifies the precautionary approach in State regulation of salmon fisheries and habitats. This policy states that in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively as follows; a precautionary approach, involving the application of prudent foresight that takes into account the uncertainties in salmon fisheries and habitat management, the biological, social, cultural, and economic risks, and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality; a precautionary approach requires consideration of the needs of future generations and avoidance of potentially irreversible changes; prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly; initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species; 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; appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production; a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

**Fundamental Clause 8: Management measures**
**Evidence adequacy rating: HIGH**

The Alaska State Constitution Section 4 states “Sustained Yield. Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses. The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.22), directs management measures to ensure sustainability of yield. The Policy is implemented through the various fishery management plans for different fisheries in different regions and areas of the state.

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**Fundamental Clause 9: Appropriate standards of fisher's competence**
**Evidence adequacy rating: HIGH**

The Alaska Institute of Technology (formerly called Alaska Vocational Training & Education Center), is within the Department of Labor Workforce Development, operates the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Centre is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Centre is a USCG approved training facility located in Seward, Alaska, and offers USCG and international Standards of Training, Certification, & Watchkeeping -compliant maritime training.

The University of Alaska Sea Grant Marine Advisory Program provides education and training in several sectors, including fisheries management, in the form of seminars and workshops. In addition, the program conducts sessions of their Alaska Young Fishermen's Summit. Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation (e.g. MSFCMA), to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. ASMI provide educational information across a whole range of fishery and fish related matters, including quality, hygiene, food safety, sustainability, and environmental protection. ADFG publishes a variety of documents, booklets and pamphlets that provide information on Alaska salmon, including regulations, educational items, and news stories

**Fundamental Clause 10: Effective legal and administrative framework**
**Evidence adequacy rating: HIGH**
The structure of ADFG, with management authority instilled at the area office level, allows it to monitor, control and enforce compliance with fishery regulations and emergency orders. Area Management Biologists are on the scene to oversee the prosecution of the fishery in their area through aerial surveys and on-the-ground observations. Area and regional staff biologists are deputized law enforcement officers trained to assist Alaska Wildlife Troopers (AWT) with law enforcement activities. Under Alaska's limited entry program, only legally permitted vessels can operate in commercial salmon fisheries. The U.S. (representing Alaska and other states) participates as a member of the NP A FC, which promotes the conservation of anadromous fishes and ecologically-related species, including marine mammals, sea birds, and non-anadromous fishes, in the high seas area of the North Pacific Ocean, beyond national boundaries. The U.S. also abides by the UN FAO's International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and has developed additional policies to prevent illegal fishing of salmon and other marine species, both within and beyond state and Federal waters.

**Fundamental Clause 11: Framework for sanctions**
**Evidence adequacy rating: HIGH**
Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16 and Alaska Administrative Code Title 5. Laws and regulations that structure the fishery are enforced by AWT. AWT coordinates with and is supported by law enforcement personnel from the US Coast Guard and NMFS Office of Law Enforcement. In most cases, violations of fish and wildlife regulations are punishable through fines, imprisonment, loss of fishing rights, and/or confiscation of equipment (including fishing vessel). All Alaska salmon fishing vessels are required by law to be licensed by the State of Alaska, and to display their permanent vessel license plate. Fishing gear must also be marked in accordance with state regulations, which are region specific.

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**Fundamental Clause 12: Impacts of the fishery on the ecosystem**
**Evidence adequacy rating: HIGH**
Alaska's Policy for the Management of Sustainable Salmon Fisheries explicitly recognizes and accounts for the influence of variable environmental conditions on Alaska's salmon stocks. The influences of environmental and ecological factors on salmon growth and survivorship are carefully considered by ADFG during development of annual escapement goals that are then used to manage commercial fisheries and direct recovery efforts for stocks of concern. Alaska's Policy for Management of Sustainable Salmon Fisheries clearly prioritizes the protection of freshwater and marine habitats, such that they not perturbed beyond the boundaries of natural variation. This policy also promotes research to assess impacts to the environment from salmon fisheries and associated hatchery operations. The most probable ecological impacts from the Alaskan commercial salmon fishery are posed through potential risks from hatchery-reared salmon to wild stocks and overfishing of the same. Hatchery risks are considered by managers and information is obtained through hatchery marking programs and ongoing research designed to measure the extent and effect of hatchery-wild interactions for several Pacific salmon species. Potential impacts from hatchery programs and harvest on wild salmon abundance is routinely monitored through state mandated spawner escapement surveys.

State and federal policies and regulations serve to minimize bycatch of non-target species in Alaskan commercial salmon fisheries, and utilize non-target, incidental catch in a sustainable manner, within the limits of existing state regulations. Alaska's Policy for the Management of Sustainable Salmon Fisheries states that "salmon escapement and harvest management decisions should be made in a manner that protects non-target salmon stocks or species" and ADF&G uses test fisheries and in-season catch information to direct harvest efforts, so as to protect stocks of concern. Incidents of serious injury or mortality to endangered species, although rare, are mandatorily reported and are subject to take limits established by the National Marine Fisheries Service and U.S. Fish and Wildlife Service in accordance with the U.S. Endangered Species Act. The Magnuson-Stevens Fisheries Management and Conservation Act, the Marine Mammal Protection Act and the U.S. Endangered Species Act all provide clear protections to endangered species that might be affected by Alaska's commercial salmon fisheries. Incidental catch in Alaskan commercial salmon fisheries occurs at a negligible level and all catch, including incidental catch of non-target species, must be reported to ADFG and not exceed established harvest limits. ADFG's escapement-based management serves to protect the ecological role of salmon in marine, aquatic and terrestrial environments. Alaskan waters, including those used by salmon and salmon fisheries, are protected by the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73/78). Moreover, essential fish habitats (EFHs) for Alaskan salmon are designated and protected by the North Pacific Fishery Management Council, NMFS and ADFG, and described in all fishery management plans. Finally, in accordance with the state's constitution, fisheries in Alaska must be managed on the principle of sustained yield, such that commercial salmon fisheries and associated hatcheries cannot undermine the structure, processes and function of salmon in marine and aquatic ecosystems.

**Fundamental Clause 13: Fisheries enhancement activities (where applicable)**
**Evidence adequacy rating: Medium**
Alaskan commercial salmon fisheries harvest wild- and hatchery-produced salmon, the latter being produced by private non-profit hatcheries that are permitted and regulated by the ADFG. In accordance with Alaska's Policy for the Management of Sustainable Salmon Fisheries and the State's Finfish Genetics Policy, hatcheries are typically sited away from major natural production areas, yet use locally-sourced fish to found and, in some cases, supplement hatchery broodstocks. State, private and federally sponsored research has and continues to focus on potential ecological and genetic effects from Alaskan salmon hatcheries, including investigations of competition, stray rates, and genetic introgression.

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Alaska's Alaska Administrative Code 5AAC39.222 Policy for the management of sustainable salmon fisheries[1]: states that, "salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of size range, sex ratio, and other population attributes". Accordingly, adult escapement is the first priority of salmon management in Alaska and is routinely monitored through aerial surveys, weirs, in-river sonar and tower-based counts. ADFG reviews the potential ecological, fishery and other impacts of proposed hatcheries before issuing a permit and has authority to revoke or deny permission for alterations to a permit. Regulations and conditions governing hatchery operations are readily available online, as are permit application portals. Alaska's Constitution and Policy for the Management of Sustainable Salmon Fisheries provide clear protections for common property salmon fisheries in Alaska, thereby safeguarding the livelihoods of local communities that use salmon as a resource. Public hearings are held at least 30 days before the issuance of a salmon hatchery permit, pursuant to state statute. Before issuing a salmon hatchery permit, ADFG reviews potential ecological, fisheries, habitat and social impacts, and may revoke a permit or deny permission for alterations to a hatchery. ADFG regulates the source, health and transport of hatchery salmon, in accordance with the State's Finfish Genetics Policy. Non-native and genetically modified fish are prohibited by this policy. In most cases, hatchery salmon in Alaska are mass marked, which allows for selective fisheries and evaluations of the impacts from fisheries on wild stocks. Hatchery salmon produced by the Kodiak Regional Aquaculture Association (KRAA) are generally not marked, representing a notable exception to standard hatchery practice and basis for the sole minor non-conformance issued during the 2016 US Alaska Commercial Salmon Reassessment. Through coordination with AFDF, KRAA has developed a Corrective Action Plan to address this minor non-conformance that includes fundraising for construction of infrastructure to begin marking hatchery salmon at its facilities.

Salmon management in Alaska requires international coordination and cooperation, because some salmon-bearing rivers in southeast Alaska are transboundary with Canada. The Pacific Salmon Treaty provides clear policy direction for responsible management of salmon fisheries and related enhancement along such rivers, and state policy prohibits the introduction of non-native stocks into these or other rivers. Alaska has developed and contributes to numerous databases that assist with management of salmon fisheries and hatchery operations. These include a variety of genetic databases, the regional coded-wire tag database (RMIS), and an otolith mark database. Alaska's Finfish Genetics Policy mandates the conservation of diversity, disease control and protection of the environment, as related to salmon fisheries enhancement in Alaska, and encourages the use of local stocks for hatchery brood. Finally, Alaska's Policy for the Management of Sustainable Salmon Fisheries clearly prohibits overfishing of naturally reproductive components of Alaskan salmon stocks. This policy is implemented through state and federal harvest regulations. Mass marking of hatchery fish and focused research efforts have investigated stray rates, competition effects and genetic introgression from hatchery salmon in Alaska. Escapement estimates produced annually by ADFG strongly suggest that wild salmon populations in the state are, on the whole, stable and productive.

[1] http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2016-2017/jointcommittee/5aac39.pdf

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# 6. Conformity Statement

The assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is granted to the U.S.A. Alaska commercial salmon [all pacific salmon species: Chinook (*Oncorhynchus tschawytscha*); sockeye (*Oncorhynchus nerka*); coho (*Oncorhynchus kisutch*); pink (*Oncorhynchus gorbuscha*); and chum (*Oncorhynchus keta*)] fisheries employing troll, purse seine, drift gillnet, set gillnet gear (and fish wheel in Upper Yukon River only) in the four administrative Regions of Alaska principally managed by the Alaska Department of Fish and Game (ADFG). While certification covers the entire Alaska Exclusive Economic Zone (EEZ), most of the harvest is taken in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.


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# 7. Evaluation of Fundamental Clauses

## 7.1. Section A. The Fisheries Management System

### 7.1.1. Fundamental Clause 1

**There shall be a structured and legally mandated management system based upon and respecting International, National and local fishery laws, for the responsible utilization of the stock under consideration and conservation of the marine environment.**

| | |
|---|---|
| **Number of Supporting clauses** | **13** |
| **Supporting clauses applicable** | **10** |
| **Supporting clauses not applicable** | **3** |
| **Overall level of conformity** | **Full Conformance** |
| **Non Conformances** | **0** |

**Summarized evidence:**

1.1. There shall be an effective legal and administrative framework established at the local and national level appropriate for the fishery resource and conservation and management.

As described in detail by the 2016 US Alaska Commercial Salmon Reassessment Report[2], Alaska's commercial salmon fisheries are managed in accordance with a transparent structure of laws, regulations, treaties, and other legal mandates at the international, national, and local (state) levels. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) or Magnuson-Stevens Act is the principal domestic legislation governing the management of American fisheries. For the State of Alaska, Section 4 (Sustained Yield) of Article VIII of Alaska's Constitution states that, "fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the state shall be utilized, developed and maintained on the sustained yield principle, subject to preferences among beneficial uses". ADFG's Commercial Fisheries Division is responsible for conservation of Alaska's salmon stocks and for management of the commercial fisheries. ADFG's area fishery managers produce annual management reports and related documents, deliberately taking into account all previously-agreed management measures. Representatives from ADFG and NMFS routinely and actively participate in several international fora and organizations [i.e. North Pacific Anadromous Fish Commission (NPAFC), Pacific Salmon Commission (PSC)]. These organizations strive for compatibility in their management and promote cooperation among states in the areas of salmon fisheries research, development and management. ADFG performs routine review and revision of conservation and management measures within the Commercial Fisheries Division, and between the latter and the BoF. ADFG'S management approach and decision-making processes for Alaska commercial salmon fisheries are made available to the public through the agency's website[3].

1.2. Management measures shall take into account the whole stock unit over its entire area of stock distribution.

ADFG's first priority for salmon management is to maintain adult escapement levels that ensure adequate Natural spawning, long-term viability of stocks and, consequently, sustainability of associated fisheries. Measures taken to meet escapement goals necessarily consider each salmon stock over its entire area of distribution, taking

[2] http://www.alaskaseafood.org/wp-content/uploads/2017/03/ALASKA-RFM-SALMON-REASSESSMENT-Final-ReportMarch-2017.pdf

[3] http://www.adfg.alaska.gov/index.cfm?adfg=process.main

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into account the cumulative effect of those factors that can influence salmon survivorship at all life stages in diverse habitats, including freshwater spawning and rearing habitats, and expansive marine environments.

1.2.1 Previously agreed management measures established and applied in the same region shall be taken into account by management.
In each management area, ADFG's fishery managers produce annual reports that describe how commercial salmon fisheries were conducted and managed for that year[4]. Fishing
Regulations, including allocation criteria and subsistence determinations, also consider past use and management. Accordingly, Alaska's commercial salmon fishery management system is informed and abides by all previously-agreed management measures.

1.3 Where trans-boundary, shared, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States (neighboring or not), the applicant management organizations concerned shall cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock/s in question and its environment.

ADFG and NMFS representatives routinely participate in several relevant Pacific salmon management organizations designed to resolve transboundary fishery management issues[5] [6] [7].

1.3.1 Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks, shall be compatible. Compatibility shall be achieved in a manner consistent with the rights, competences and interests of the States concerned.

Management agreements and arrangements for promoting research have been developed for Pacific salmon throughout the range of all five North American species. Conservation and management measures include a prohibition of high seas fishing for salmon by all nations involved (Japan, Canada and the United States; the Bilateral Pacific Salmon Treaty (PST[8]) and supporting this, research that furthered understanding of marine range and distribution of Pacific salmon. Multi-agency and -state organizations, such as PSC, PSMFC and NPAFC, of which ADFG and NMFS salmon scientists and managers participate, strive for compatibility in their salmon fishery management measures. These organizations recognize sustained yield and conservation as their highest priority, even in cases where different states (i.e. US and Canada) compete for the same fishery resource.

1.4 A State not member/participant of a sub-regional or regional fisheries management organization shall cooperate, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such Organization/arrangement.

[4] http://www.adfg.alaska.gov/index.cfm?adfg=fishingcommercialbyarea.main

[5] http://www.npafc.org/new/index.html

[6] http://www.psc.org

[7] http://www.psmfc.org

[8] https://www.nwcouncil.org/history/Trilateral

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NOT APPLICABLE. Nations that fish in Alaska's North Pacific salmon fishery, namely the U.S. and Canada, are members of the NPFMC, PSC and PFMC.

1.5 The Applicant fishery's management system shall actively foster international cooperation and coordination on fishery matters with regard to:
Information gathering and exchange

- Fisheries research
- Fisheries management
- Fisheries develop

Representatives of ADFG and NMFS routinely and actively participate in several relevant forums and organizations including, but not limited to, North Pacific Anadromous Fish Commission (NPAFC); Pacific Salmon Commission (PSC); Pacific States Marine Fisheries Commission (PSMFC). These organizations actively foster cooperation among States with regard to salmon fisheries research and management. ADFG and various federal agencies participate in numerous organizations that collect information about aquatic and marine ecosystems, and status and management of Alaskan salmon fisheries.

1.6 States and sub-regional or regional fisheries management organizations and arrangements, as appropriate, shall agree on the means by which the activities of such organizations and arrangements will be financed, bearing in mind, inter alia, the relative benefits derived from the fishery and the differing capacities of countries to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements shall aim to recover the costs of fisheries conservation, management and research.

Management bodies such as NPAFC, PSC and PSMFC and their activities, which can affect Alaskan commercial salmon fishery management, are supported through national and international agreements[9][10] [11].

1.6.1 Without prejudice to relevant international agreements, States shall encourage banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures.
NOT APPLICABLE

1.7. Procedures shall be in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information.

- Review procedures shall be established within the management system.
- A mechanism for revision of management measures shall exist.

Alaska's salmon fisheries are managed by ADFG, and the agency's Division of Commercial Fisheries[12] manages commercial harvests and, in conjunction with the Division of Subsistence[13], removals by subsistence fishermen.

[9] http://www.npafc.org/new/publications/HandBook/Handbook%203rd%20E%20English.pdf
[10] http://www.psc.org/pubs/About/OrientationGeneralJune2015.pdf
[11] 11http://www.psmfc.org/psmfc-info

[12] http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main
[13] http://www.adfg.alaska.gov/index.cfm?adfg=fishingSubsistence.main

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The Division of Sport Fisheries[14] manages sport and personal use resource removals. Every three years (based on the Board of Fisheries (BoF) schedule) each Alaska Region updates its escapement information and submits a salmon stock status report to the BoF. This report (mandated in the Policy for the Management of Sustainable Salmon Fisheries, 5AAC 39.222[15]) reviews the status of all stocks within each management area, recommends escapement goals based on the past three years' data, identifies stocks of concern, and develops management and action plans to address relevant issues.

1.8. The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.

- Management arrangements
- Decision-making

The management arrangements and decision-making processes for Alaska commercial salmon fisheries are organized in a very transparent manner, and are made available to the public through ADFG's website[16].
Both annual (pre-season) and in-season management arrangements are employed in Alaskan commercial salmon fisheries. Similarly, BoF and ADFG use both pre- and in-season decision-making processes that involve and consider public comment, to manage Alaskan salmon fisheries

1.9. Management organizations not party to the Agreement to promote compliance with international conservation and management measures by vessels fishing in the high seas shall be encouraged to accept the Agreement and to adopt laws and regulations consistent with the provisions of the Agreement.

NOT APPLICABLE. Staff from US agencies participates within several international organizations responsible for high seas fisheries management.

[14] http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main
[15] http://www.housemajority.org/coms/jcis/pdfs/Sustainable_Salmon_Fisheries_Policy.pdf
[16] http://www.adfg.alaska.gov/index.cfm?adfg=fishingcommercialbyarea.main

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### 7.1.2. Fundamental Clause 2

**Management organizations shall participate in coastal area management institutional frameworks, decision-making processes and activities related to the fishery and its users, in support of sustainable and integrated resource use, and conflict avoidance.**

| | |
|---|---|
| **Number of Supporting clauses** | **10** |
| **Supporting clauses applicable** | **9** |
| **Supporting clauses not applicable** | **1** |
| **Overall level of conformity** | **Full Conformance** |
| **Non Conformances** | **0** |

**Summarized evidence:**

2.1./2.2./2.3./2.4. Policy, legal and institutional frameworks adopted to achieve sustainable and integrated use of marine resources along with mechanisms to avoid conflict shall be in place. Representatives of the fisheries sector and fishing communities shall be consulted in decision making processes and information related to management measures shall be disseminated.

An appropriate policy, legal and institutional framework shall be adopted in order to achieve sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development. In setting policies for the management of coastal areas, 4) States shall take due account of the risks and uncertainties involved. The salmon fishery management organizations in Alaska (principally ADFG and National Oceanic and Atmospheric Administration (NOAA)) participate in coastal area management-related institutional frameworks processes that safeguard biological species and their habitats (i.e. NEPA, EFH). These frameworks include decision-making processes and activities relevant to the fishery resource and its users that support sustainable and integrated use of living marine resources, and limit or avoid conflict among users. ADFG is responsible for the protection, management, conservation, and restoration of Alaska's fish and game resources. The BoF is responsible for considering and adopting regulations to allocate resources among user groups; establishing fish reserves and conservation areas, fishing seasons, quotas, bag limits and size restrictions; habitat protection; stock enhancement; and developing commercial, subsistence, sport and personal use fisheries. ADFG has the statutory responsibility for protecting freshwater anadromous fish habitat and providing free passage for anadromous and resident fish in fresh water bodies (AS 16.05.841871)[17]. The Department of Environmental Conservation (DEC) implements statutes and regulations affecting air, land and water quality. DEC is the lead state agency for implementing the federal Clean Water Act and promotes high quality fish and wildlife habitat through pollution prevention. Through collaboration with other state, federal and local agencies, ADFG protects estuarine and marine habitats in Alaska. ADF&G has jurisdiction over streams that have been designated as anadromous fish streams and legislatively. Some marine species also receive special consideration through the state Endangered Species program. The Department of Natural Resources (DNR) manages all state-owned land, water and natural resources except for fish and game. The MSFCMA include provisions concerning the identification and conservation of Essential Fish Habitat (EFH). The MSFCMA defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or

[17] http://www.adfg.alaska.gov/index.cfm?adfg=habitatregulations.main

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growth to maturity." The National Marine Fisheries Service (NMFS) and regional Fishery Management Councils (Councils) must describe and identify

EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with NMFS, and NMFS must provide relevant habitat conservation recommendations. All fishery management plans include a description and identification of EFH, adverse impacts, and actions to conserve and enhance habitat. Finally, NOAA Fisheries' Habitat Conservation Division (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on Essential Fish Habitat (EFH) and living marine resources in Alaska.

2.1.1 States shall establish mechanisms for cooperation and coordination among national authorities involved in planning, development, conservation and management of coastal areas. Given the vast area, species and issues involved, salmon management in Alaska requires cooperation among domestic and international entities through diverse treaties, regulations, and other agreements. Federal and state agencies cooperate to manage Alaska's commercial salmon fisheries.

Multi-state and international organizations, such as North Pacific Fisheries Management Council (NPFAC), PSC, PFMSC, develop and provide mechanisms that promote coordinated conservation and management plans and actions. Historically, salmon management in Alaska has been implemented by several agencies, including the ADFG, and the National Oceanographic and Atmospheric Administration (NOAA). Networking among these groups has been critical to the conservation of Alaska's salmon fishery resource. Alaska Department of Fish and Game's Habitat Division is delegated by the Commissioner to implement the state's Title 16 authority for Fish Habitat and Special Area permitting. Unlike many of ADFG's regulations, which are developed through the Board process and address harvest, Fish Habitat and Special Area laws address land use activities in fish-bearing streams and in the State's legislatively designated refuges, critical habitat areas, and sanctuaries through a project review and permitting process. NOAA Fisheries' Habitat Conservation Division (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on Essential Fish Habitat (EFH) and living marine resources in Alaska.

2.1.2 States shall ensure that the authority or authorities representing the fisheries sector in the coastal management process have the appropriate technical capacities and financial resources.

Management organizations like the North Pacific Anadromous Fish Commission (NPAFC), the Pacific Salmon Commission (PSC) and the Pacific States Marine Fisheries Council (PSMFC) derive their technical capacities from member parties and are funded by annual dues paid by participant governments (PSC), as well as federal grants and contracts (PSMFC). ADFG has an annual operating budget of approximately $200 million, supported by a variety of funding sources, including federal receipts, general fund receipts, and fish and game fund receipts.

2.2 Representatives of the fisheries sector and fishing communities shall be consulted in the decision-making processes involved in other activities related to coastal area management planning and development. The public shall also be kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected. Representatives from fishery management organizations and fishing communities participate in coastal area management planning through the federal National Environmental Policy Act (NEPA) processes. This includes decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The review process requires participation by the project

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applicant; State resource agencies including the Alaska Departments of Environmental Conservation (DEC), Fish and Game (ADFG), and Natural Resources (DNR); the affected local coastal district office; and other interested members of the public, including fishermen's organizations and private individuals[18].

2.3 Fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g. aquaculture, tourism, energy) shall be adopted and fishing shall be regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Procedures and mechanisms shall be established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.

The BoF process, which establishes gear types and seasons for Alaska's commercial salmon fisheries, also serves to provide a forum for fishery conflict resolution. Further, the NEPA review process[19]19, deliberately takes into account all marine and fishery resources and users of those resources in order to resolve potential conflicts among users before project approvals are given. Members of the commercial and recreational fishery, the environmental community, and the public at-large are encouraged to testify at Council meetings and hearings. This involves speaking in a public forum. Public testimony to the Advisory Panel may lead to a proposal to the Council, which may then lead to a discussion paper and Council development of alternatives to address the problem or situation identified.

2.4 States and sub-regional or regional fisheries management organizations and arrangements shall give due publicity to conservation and management measures and ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures shall be explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures.

Fisheries management agencies such as ADFG, NOAA, and NPMFC have developed and host websites that clearly describe salmon management and conservation measures. ADFG offers public education programs focused on the importance of salmon to Alaska's culture, economy and ecosystems. This agency also provides educational materials to educators and regularly participates in public Sportsman Shows, Commercial Fisheries Trade shows and Gear Group meetings for the purposes of outreach and public education. In 2007, ADFG Sport Fish Division developed an Aquatic Resources Implementation Plan for Alaska's Comprehensive Wildlife Conservation Strategy (CWCS). This plan is intended to initiate and expand partnerships with other agencies and non-governmental organizations (NGOs) that will conserve, improve, and manage Alaska's habitats for aquatic species, as well as develop education

2.5. The economic, social and cultural value of coastal resources shall be assessed in order to assist decision-making on their allocation and use.

The economic, social and cultural value of coastal resources shall be assessed in order to assist decision making on their allocation and use. The value of coastal salmon resources from economic, cultural and social perspectives is regularly assessed to inform allocation and use decisions. The Alaska Commercial Fisheries Entry Commission (CFEC) helps conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers. The National Environmental Policy Act (NEPA) processes provide the public with information and an opportunity for involvement at both state and federal levels. Decisions are made through public processes and involvement by fishery managers and stakeholders is encouraged through public advertisement and announcement of scheduled meetings. Assessment of the social and cultural value of coastal

[18] http://www.adfg.alaska.gov/index.cfm?adfg=uselicense.main.
[19] https://alaskafisheries.noaa.gov/fisheries/nepa-guidance

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resources is integral to the decision-making process for fishery resource allocation and use in Alaska. The 2016 US Alaska Commercial Salmon Reassessment Report[20]20 further describes the history and processes associated with merging economic, social and cultural values with resource allocation decisions that are relevant to Alaska's commercial salmon fishery.

2.6./2.7/2.8. Research and monitoring of the coastal environment, mechanisms for cooperation and coordination, appropriate technical capacities and financial resources, conflict avoidance amongst user groups

2.6 States shall cooperate at the sub-regional level in order to improve coastal area management, and in accordance with capacities, measures shall be taken to establish or promote systems for research and monitoring of the coastal environment, in order to improve coastal area management, and promote multidisciplinary research in support and improvement of coastal area management using physical, chemical, biological, economic, social, legal and institutional aspects.

ADFG participates with federal, state and international agencies and institutions in numerous research and monitoring programs that assess physical, chemical, biological, economic and social parameters of the coastal area. ADFG regularly publishes their findings in agency technical reports that can typically be accessed online, through their website[21]. One of the functions of the NPAFC is to provide a venue for coordinating the collection, exchange, and analysis of scientific data regarding anadromous fishes, primarily Pacific salmon, and other ecologically-related species[22]. The NPAFC's scientific research focuses on trends in marine production of salmon stocks, their population structure and diversity in marine ecosystems of the North Pacific, and impacts from climate change.

2.7 States shall, within the framework of coastal area management plan, establish management systems for artificial reefs and fish aggregation devices. Such management systems shall require approval for the construction and deployment of such reefs and devices and shall take into account the interests of fishers, including artisanal and subsistence fishers.

NOT APPLICABLE. Alaska's commercial salmon fisheries do not use artificial reefs or fish aggregation devices.

2.8 In the case of activities that may have an adverse transboundary environmental effect on coastal areas, States shall: a) Provide timely information and if possible, prior notification to potentially affected States; b) Consult with those States as early as possible.

Because numerous salmon-bearing rivers in Southeast Alaska are transboundary with Canada, Alaska State, U.S. federal and Canadian agencies, as well as tribal (i.e. First Nations) governments maintain interest in planning and decision-making that may affect salmon and their habitats. Representatives from Alaska's departments of Fish and Game, Natural Resources, Environmental Conservation, the U.S. Coast Guard, as well as other public officials

[20] http://www.alaskaseafood.org/wp-content/uploads/2017/03/ALASKA-RFM-SALMON-REASSESSMENT-Final-Report-2017.pdf
[21] http://www.adfg.alaska.gov/index.cfm?adfg=librarypublications.publications_reports#fisheries
[22] http://www.npafc.org/new/publications/HandBook/Handbook%203rd%20E%20English.pdf

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and non-public agency experts occasionally participate in Canadian permitting processes. In the past, most review processes have focused on individual British Columbia development projects. In 2015, USA and Canada governments signed a Memorandum of Understanding regarding transboundary waters. While the MOU is not a legally binding document, it is a firm commitment by both governments to continue working together where possible. The MOU identifies the broad areas of continued or new activity by Alaska and British Columbia, including:

- Establishing a bilateral working group on the protection of transboundary waters;
- Sharing best practices on workforce development and training;
- Advancing marine transportation reliability and safety;
- Reinforcing emergency management mutual aid response through the existing Pacific Northwest Emergency Management Arrangement;
- Fostering continued growth of existing and increased transportation links; Continuing joint visitor industry promotion;
- And exploring other areas for cooperative action, including natural resource development, fisheries, ocean acidification, border management, trade and investment, and climate change adaptation

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### 7.1.3. Fundamental Clause 3

**Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.**

| | |
|---|---|
| **Number of Supporting clauses** | **7** |
| **Supporting clauses applicable** | **7** |
| **Supporting clauses not applicable** | **0** |
| **Overall level of conformity** | **Full Conformance** |
| **Non Conformances** | **0** |

**Summarized evidence:**

3.1. Long-term management objectives shall be translated into a plan or other management document and be subscribed to by all interested parties.

The principal role of the Board of Fisheries (BoF) is to conserve and develop the fishery resources of Alaska. The Board achieves its mission in part by setting seasons and regulations for the state's subsistence, commercial, sport, guided sport, and personal use fisheries. The BoF also establishes policy and provides management direction for the state's fishery resources. The BoF is charged with making allocative decisions, and ADFG is responsible for management based on those decisions. General precepts are established by the BoF and incorporated into regulation. The long-term objectives for Alaska's commercial salmon fisheries are primarily established through three policy statements, incorporated into state regulation, Title 5 Alaska Administrative Code, by the BoF: 39.220 Policy for the Management of Mixed Stock Salmon Fisheries[23] 39.222 Policy for the Management of Sustainable Salmon Fisheries[24] 39.223 Policy for State-wide Salmon Escapement Goals[25].

3.2. /3.2.1 Management measures should limit excess fishing capacity, promote responsible fisheries, take into account artisanal fisheries, protect biodiversity and allow depleted stocks to recover. Excess fishing capacity shall be avoided and exploitation of the stocks remains economically viable.
Alaska has successfully managed sustained yield of its salmon fisheries since implementation of the limited entry permit system in 1973[26]. The Alaska Commercial Fisheries Entry Commission (CFEC) regulates the number of participating fishers, thereby conserving the resource and safeguarding the economic viability of the fishery[27]. Entry into regional salmon fisheries is controlled by the Commission, and the number of permits issued is regulated in accordance with the projected value of each fishery.

3.2.2 The economic conditions under which fishing industries operate shall promote responsible fisheries.
While the BoF and ADFG continue to set and adjust biologically-based escapement goals to conserve Alaska's salmon stocks, the limited entry permitting process of the CFEC serves to safeguard the economic viability of dependent fisheries. The separation of allocative and conservation responsibilities of the BoF and ADFG Promotes responsible fisheries by balancing resource use and conservation needs.

3.2.3 The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries shall be taken into account.

[23] http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/findings/ff93145x.pdf
[24] http://www.housemajority.org/coms/jcis/pdfs/Sustainable_Salmon_Fisheries_Policy.pdf
[25] http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter039/section223.htm
[26] https://www.cfec.state.ak.us/pregs/Homan30YrsLimitedEntrySummary.pdf
[27] http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1288&context=alr

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The interests of all harvesters are protected through the BoF process[28]. The BoF receives recommendations from 82 local Advisory Committees that represent communities from diverse regions of Alaska. The BoF develops regulation proposals, evaluate proposals, debates conservation, advises regional councils and consults with interested parties. Subsistence uses of salmon are given preference in law over other uses in fishery management, in accordance with Alaska statute AS 16.05.258.

3.2.4 Biodiversity of aquatic habitats and ecosystems shall be conserved and endangered species shall be protected. Where relevant, there shall be pertinent objectives, and as necessary, management measures. Conservation of the biodiversity of aquatic habitats and ecosystems is the responsibility of Habitat Division within ADFG[29] (AS 16.05.871, AS 16.05.841). Activities by individuals, private companies, or agencies within streams used by anadromous fish require permission of the ADFG. The Division oversees activities in refuges, critical habitat, and sanctuaries. It coordinates with other agencies in reviewing plans for forestry, mining, oil and gas development and coastal management. The State of Alaska (i.e. ADFG) is responsible for determining and maintaining a list of endangered species in Alaska under AS 16.20.190. The Policy for the Management of Sustainable Salmon Fisheries (SSFP; 5 AAC 39.222, effective 2000, amended 2001) directs ADFG to provide the Alaska BoF)with reports on the status of salmon stocks and identify any stock that presents a concern. In consultation with ADFG, the BoF may designate, amend, or discontinue Stocks of Concern based on stock status reports and recommendations from ADFG.

3.2.5 There shall be management objectives seeking to avoid, minimize or mitigate impacts of the unit of certification on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.
Essential habitat of Alaskan salmon is explicitly protected by policy. Alaska's Policy for the management of sustainable salmon fisheries[30] (5AAC 39.222) stipulates that:

- In formulating fishery management plans designed to achieve maximal 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 the fisheries or expanding fisheries
- Wild salmon stocks and the salmon's habitats should be maintained at levels of resource productivity that assure sustained yields as follows:
- 1) Salmon spawning, rearing, and migratory habitats
- 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 impacts of the alterations on salmon populations should be conducted before approval of a proposal;
- iii) All essential salmon habitat in marine, estuarine, and fresh water ecosystems and access of salmon to these habitats should be protected
- iv) Salmon stocks should be protected within spawning, incubating, rearing and migratory habitats.

3.2.6 There shall be management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.

[28] http://www.adfg.alaska.gov/index.cfm?adfg=process.acoverview
[29] http://www.adfg.alaska.gov/index.cfm?adfg=divisions.haboverview
[30] http://www.housemajority.org/coms/jcis/pdfs/Sustainable_Salmon_Fisheries_Policy.pdf

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Article 2, 5AAC 39.220, Policy for the management of mixed stock salmon fisheries[31]31, requires that "a) ... conservation of wild salmon stocks consistent with sustained yield shall be accorded the highest priority". 5AAC 39.222, the Policy for the management of sustainable salmon fisheries[32]32, also describes a number of key requirements with respect to wild salmon fisheries. With respect to enhancement (hatcheries), these requirements state that:

- Effects and interactions of introduced or enhanced salmon stocks on wild salmon stocks should be assessed;
- Wild salmon stocks and fisheries on those stocks should be protected from adverse impacts from artificial propagation and enhancement efforts.
- Depleted salmon stocks should be allowed to recover or, where appropriate, should be actively restored; diversity should be maintained to the maximum extent possible, at the genetic, population, species, and ecosystem levels. The policy specifically identifies implementation of a precautionary approach for maintaining wild salmon populations.

[31] http://www.housemajority.org/coms/jcis/pdfs/Sustainable_Salmon_Fisheries_Policy.pdf
[32] http://www.housemajority.org/coms/jcis/pdfs/Sustainable_Salmon_Fisheries_Policy.pdf

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## 7.2. Section B. Science and Stock Assessment Activities

### 7.2.1. Fundamental Clause 4

**There shall be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes.**

| | |
|---|---|
| **Number of Supporting clauses** | **13** |
| **Supporting clauses applicable** | **10** |
| **Supporting clauses not applicable** | **3** |
| **Overall level of conformity** | **Full Conformance** |
| **Non Conformances** | **0** |

**Summarized evidence:**

4.1. All fishery removals and mortality of the target stock(s) shall be considered by management.

To facilitate fine-scale management, state waters have been classified and numbered into regions, areas, districts, sub-districts, individual river systems and sections within rivers when needed (see for example Gray et al. 2014 or the on-line map resources http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmonmaps . A record of sale for each commercial landing provides the location, time, species, number and weight of fish caught. In season, area offices compile summaries of the catch and effort from these fish tickets. The Division of Commercial Fisheries Computer Services section maintains the fish ticket computer software and archives the fish ticket data. Historically, the area offices edited and entered the data from these paper fish tickets. The state is the process of developing and deploying an electronic fish ticket system (see http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.elandings ).

Commercial catch estimates, both in season and historic, are readily available on the Commercial Fisheries website (http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmcatch.php). Catch and effort data is also available in annual management reports for each area. For sport fisheries, state-wide estimates of harvest (the state-wide harvest survey and guide logbook programs) are administered by the Research and Technical Services section. Sport fishery harvest and fishing effort estimates obtained from the state-wide harvest survey are available on the Sport Fish website ( http://www.sf.adfg.state.ak.us/statewide/FishingSurvey/ ).

The first buyer of raw fish, persons who catch and process fish, and persons who catch and have fish processed by another business are required to file an annual report of their purchasing and processing activities. This report is called the Commercial Operator's Annual Report (COAR) and is due by April 1 of the following year (http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.coar).

To promote and support development of applied research and stock assessment necessary for informed management, the ADF&G employs research staff in each region and area office who not only guide local development of information critical to management, but also participate in and advise managers when making in-season management decisions. Specialized services such as decoding micro-wire tags and conducting genetic studies are maintained at the headquarters level and have strong linkages to local programs. Distribution of stock assessment information takes many forms, beginning with real-time summaries being hand delivered to managers as necessary, being entered into regionally maintained databases for rapid access by regional staff, in-season

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memoranda's being distributed to area, regional and headquarters staff to final reports being accessible on-line (see http://www.adfg.alaska.gov/index.cfm?adfg=library.main ). Research results are typically incorporated into reports to the Board of Fisheries to inform the development of Management Plans (see for example http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=01-31-2014&meeting=uci).

4.1.2. In the absence of specific information on the "stock under consideration", generic evidence based on similar stocks can be used for fisheries with low risk to that "stock under consideration". However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries

Evidence of full conformance can be found in the annual management reports for each fishery, for example Elison et al. 2015. Annual management reports for can be found at http://www.adfg.alaska.gov/index.cfm?adfg=fishingcommercialbyarea.main

4.2. An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.

Observers are generally not needed to monitor compliance with regulations, or to collect data needed for management in Alaska's salmon fisheries. Alaska's commercial salmon fisheries occur in-river or close to shore and fish that are harvested are sold in Alaskan ports where the weight, number and location of harvest are reported on fish tickets. Biological samples of the harvests are typically sampled at the port of landing. Additionally, Area Management Biologist and Department of Public Safety personnel often observe the fisheries to ensure compliance with time, area and gear requirements. State regulations (5AAC; 39.140, Inspection of Fishing Establishments and Vessels), allow ADFG and Department of Public Safety personnel with unobstructed access to all fishing vessels and processing establishments to inspect catch, gear and compliance with Alaska laws and regulations.

When special needs arise, the ADFG has placed observers aboard salmon fishing vessels. For example there has been a need to verify estimates of immature Chinook salmon caught and released in Southeast troll fishery (Davis et al. 1989) and to verify estimates of Chinook caught in the Southeast purse seine fishery (Rowse and Marshall 1988).

4.3. Management entities shall make data available in a timely manner and in an agreed format in accordance with agreed procedures.

By Alaska Statute 16.05.815 (Confidential Nature of Certain Reports and Records) except
for certain circumstances, all records obtained by the state concerning the landing of fish, shellfish, or fishery products and annual statistical reports of fishermen, buyers and processors, may not be released. To ensure confidentiality, fishery data are routinely redacted from ADFG reports if the data for a time/area strata was obtained from a small number of participants (see for example Weiland et al. 2003).

Besides the extensive inseason and post season reporting undertaken by ADFG previously cited, there are process in place to share data with other states through the Pacific States Marine Fisheries Commission (PSMFC) and with Canada through the Yukon Panel and PSC. The PSMFC maintains a coast wide database of catch needed to interpret recoveries of coded micro-wire tags. A committee within the PSMFC composed of representatives of states, federal and tribal staff guide development and maintenance of the database in accordance with their respective agencies policies and regulations such as confidentiality (see http://www.psmfc.org/program/regional-mark-processing-center-coded-wire-tag-rmpc?pid=17 ). The PSC has established Technical Committees to compile and evaluate stock assessment data and a Data Sharing Committee (see for example the Chinook

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Technical Committee reports http://www.psc.org/publications_tech_techcommitteereport.htm#TCCHINOOK and PSCJTCDS 1989).

4.4/4.5. States shall stimulate the research required to support national policies related to fish as food and collect sufficient knowledge of social, economic and institutional factors relevant to the fishery in question to support policy formulation.

State and national policies regarding seafood are guided by the Alaska Seafood Marketing Institute (ASMI), U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), the U.S. National Institute of Health (NIH). ASMI http://www.alaskaseafood.org is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training and sustainability certification. The powers of the ASMI Board (AS 1651.090) include conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state (see for example Nettleton 2009).

The state of Alaska also operates the Kodiak Seafood and Marine Science Center (KSMSC). Among other things, KSMSC works to discover better methods to preserve, process, and package seafood. It has research kitchens, biochemistry labs and food labs with experimental seafood processing equipment that are used to test production techniques and develop new seafood products and evaluate fish as food (see for example Faber et al. 2010). KSMSC staff work closely with the industry to convey research results and provide educational opportunities that help seafood workers improve efficiency and the quality of their products.

Knowledge of the economic, social and cultural aspects of fish and fishing are critical to management of Alaska's salmon fisheries. The need for these kinds of data is evident in the regulations and statutes. For example:

1. The BF must (AS 16.05.251(17) (e)) consider seven social, economic and cultural criteria when adopting a regulation that determine how to distribute fishing opportunity among identified user groups.

2. The BoF must (AS 16.05.25) consider 13 socio-economic and cultural factors to determine what areas will be open or closed to subsistence fishing.

3. The Policy for the Management of Sustainable Salmon Fisheries (5AAC 39.222(c) (5)) requires the BoF to consider (among other things) the social, cultural and economic risks and needs of future generations.

4. The CFEC uses economic and biological data to establish the number of permits that will be issued to participate in the state's commercial fisheries.

The state relies on several sources of social, cultural and economic information to develop management policy.

There are 82 local Advisory Committees composed of interested citizens most of whom are participants in commercial, sport, subsistence or personal use fisheries (or hunting and trapping) to provide local knowledge of the social, economic and institutional factors to the BoF (5AAC 96.010) (see for example Anchorage Advisory Committee 2014 http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2014-2015/pws_finfish/ac_comments_pws_2014.pdf.

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The Commercial Fisheries Division maintains data on the ex-vessel value of commercial landings http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.exvesselquery and on wholesale value http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmoncatch_wholesale .

The Sport Fish Division has published reports on the value of recreational fishing (see for example Southwick *et al.* 2008).

The Division of Subsistence publishes numerous papers on the history and current use of salmon for subsistence (see for example Ikuta et al. 2013 and Marchioni *et al*. 2013).

The ASMIhas contracted studies to determine the value of Alaska's Seafood Industry (see for example McDowell 2015).

The University of Alaska Institute of Social and Economic Research conducts research on the salmon fisheries of Alaska (see for example Knapp 2011).

The CFEC publishes research on the optimum number of permits that should be issued for a fishery (see for example Schelle *et al.* 2004).

4.7. States conducting scientific research activities in waters under the jurisdiction of another State shall ensure that their vessels comply with the laws and regulations of that State and international law.

The state of Alaska does not conduct salmon research aboard vessels in the waters of other states. There are however cooperative studies in the Transboundary Rivers and ADFG employees may travel into Canada via skiffs to assist in field activities. All such activities are coordinated through the Transboundary Rivers Technical Committee or Yukon River Technical Committee.

4.8. States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas.

Coordination and sharing of salmon research on the high seas is accomplished through the NPAFC http://www.npafc.org/new/index.html. The NPAFC is an international organization established by the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean signed in 1992. The member countries are Canada, Japan, Republic of Korea, Russian Federation and United States. The Convention area includes the North Pacific Ocean and its adjacent seas, north of 33 degrees North Latitude beyond 200-miles zones of the coastal States. While key convention measures are aimed at prohibiting directed fishing and retention of incidentally caught salmon in the Convention area, the Convention also authorizes coordinated research on anadromous stocks.

The Convention authorizes fishing for anadromous fish in the Convention Area for scientific purposes under national and joint research programs approved by the NPAFC. The taking of anadromous fish for scientific purposes must be consistent with the needs of the research program and provisions of the Convention and be reported to the Commission. Scientific research is conducted under the Commission's Science Plan (Anonymous 2010). The Commission has developed a consensus long-term research and monitoring plan for Pacific salmon in the North Pacific (Beamish et. al. 2009). The member countries cooperate in collecting, reporting and exchanging biostatistical data, biological samples, fisheries data and organizing scientific communications, such as seminars, workshops, exchanges of scientific personnel and publications ( See for example Farley et al. Eds. 2009) . The

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members provide catch, enhancement and other technical information and material pertaining to areas adjacent to the Convention Area from which anadromous stocks migrate into the Convention Area ( See http://wgosm.npafc.org/ and http://www.npafc.org/new/science_statistics.html ).

4.9/4.10/4.11. States shall promote and enhance the research capacities of developing countries, support (upon request) States engaged in research investigations aimed at evaluating stocks which have been previously un-fished or very lightly fished.

These clauses are not relevant.

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### 7.2.2. Fundamental Clause 5

**There shall be regular stock assessment activities appropriate for the fishery, its range, the species biology and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization.**

| | |
|---|---|
| **Number of Supporting clauses** | **7** |
| **Supporting clauses applicable** | **7** |
| **Supporting clauses not applicable** | **0** |
| **Overall level of conformity** | **Full Conformance** |
| **Non Conformances** | **0** |

**Summarized Evidence:**

5.1 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. The research shall be disseminated accordingly. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

Alaska salmon resources are abundant, diverse and spread over an immense landscape. To develop the scientific knowledge and management expertise needed to successfully implement sustained yield, as required by the state's constitution, the ADFG was organized into a hierarchal scheme. The core research and management functions are conducted by professional staff deployed to 23 area offices located throughout the state (http://www.adfg.alaska.gov/index.cfm?adfg=contacts.main). Overarching the area office structure, are four specialized Divisions within the Department that have responsibilities for fisheries issues. The Commercial Fish Division http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main has the primary responsibility for research and management of stocks that are harvested commercially. The Sport Fish Division http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main is responsible for research and management of stocks of primary interest to recreational fishermen, and also takes the lead role in research on several stocks that are shared between commercial and recreational fishers. The Habitat Division http://www.adfg.alaska.gov/index.cfm?adfg=divisions.habmission conducts applied research to develop methods and means to minimize impacts of development projects on fish and wildlife resources, issue permits for activities that may impact fish and maintains a catalogue of waters that salmon inhabit. The Subsistence Division http://www.adfg.alaska.gov/index.cfm?adfg=divisions.subsmission compiles and analyze existing data and conducts research to gather information on the role of subsistence fishing by Alaskans.

Within each Division, administrative regions were established. Staff at the regional offices provide administrative, biometric, computer hardware and software, research and management support to the area office staff. At the Division level, senior staff provide overall guidance to the regional staff in management, research and biometrics as well as providing statewide technical services, such as the Gene Conservation Laboratory http://www.adfg.alaska.gov/index.cfm?adfg=fishinggeneconservationlab.main .

Educational and experience standards for all ADFG employees are maintained by the State's Department of Administration; the standards are rigorous and specific to help ensure that only appropriately educated and experienced people qualify for the professional and technical positions within the ADFG (see for example specifications for a Biometrician IV https://www.governmentjobs.com/careers/alaska/classspecs/889586).

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At the core of the ADFG's scientific program is a requirement for peer reviewed planning. Scientific research and applied stock assessment activities undertaken is rigorously reviewed at the area and regional level, and may also be reviewed at the headquarters level to ensure relevance to management, and scientific rigor (Regnart and Swanton 2012). Examples of stock assessment operational plans are Richards et al. 2013 and Bernard and Jones 2010. Each year, the area management staff prepare a detailed report on the results of harvest, effort and escapements and other stock assessment activities undertaken in their area (see for example Shields and Dupuis 2015.

The ADFG's program is augmented by research conducted by biologist in other state and Federal agencies. The Alaska Region of the National Marine Fisheries Service's Auke Bay Laboratory http://www.afsc.noaa.gov/ABL/default.php plays an important role in supporting implementation of the Pacific Salmon Treaty and in research in the marine phase of salmon life history. The U.S. Fish and Wildlife Service (USFWS) Http://www.fws.gov/alaska/fisheries/fieldoffice/anchorage/field/program_overview.htm augments state stock assessment by conducting research on salmon production and habit on federal lands. The U.S Forest Service, U.S. Park Service and U.S. Bureau of Land Management perform fisheries research projects and activities associated with management of subsistence fisheries on federal lands. The University of Alaska https://www.uaf.edu/sfos/ and the University of Washington http://depts.washington.edu/aksalmon/ maintain active faculty and graduate student fisheries research programs.

5.1.2. States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. Results of analyses shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

Evidence:

Research into the biology, ecology, environmental science and aquaculture is conducted by several institutions.

1. The ADFGs Area, Regional and Headquarters research staff are actively involved in many fishery research programs. For example, the Gene Conservation Laboratory staff work in understanding age and growth (Lewis et al. 2015), the Fish Pathology Laboratory's work on health of cultured fish (Meyers 2007), headquarters staff research into understanding the accuracy of sonar to measure fish size (Burwen et al. 2010) and work to understand methods for setting escapement goals (Clark et al. 2014). The Department's publications are accessible via a searchable database at http://www.adfg.alaska.gov/index.cfm?adfg=library.main
.
2. The National Marine Fisheries Service Auke Bay Laboratory http://www.afsc.noaa.gov/ABL/default.php
Conducts research into the early marine life history of salmon (Hertz et al. 2015), genetics and stock identification (Kondezla et al. 2016) and environmental science and pollution (Farrow et al. 2016).
3. The University of Alaska https://www.uaf.edu/sfos/
Has an extensive graduate student and faculty research program in salmon fisheries (see for example Adkison, M. D. 2010).
4. The University of Washington http://depts.washington.edu/aksalmon/ maintains three field stations in Alaska to study salmon and train graduate students. The program has a distinguished publication history, a recent example of which is Clark et al. 2015.
5. The USFWS augments state stock assessment by conducing s research on salmon production and habit on federal lands, (see for example Tanner and Suresh 2014).

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6. The U.S Forest Service, U.S. Park Service and U.S. Bureau of Land Management perform fisheries research projects and activities associated with management of subsistence fisheries on federal lands.
7. The Prince William Sound Science Center (PWSSC) http://pwssc.org/ conducts studies and collaborates with other agencies to answer questions about resource use and sustainability, the impacts of oil development and transportation, foods webs which support coastal and inland economies, and about issues associated with the management, harvest and processing of fish and shellfish.

Social and economic data and research is undertaken by several institutions.

1. The Commercial Fisheries Division maintains data on the ex-vessel value of commercial landings http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.exvesselquery and on wholesale value http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmoncatch_wholesale.
2. The Sport Fish Division has published reports on the value of recreational fishing (see for example Southwick et al. 2008).

3. The ASMI has contracted studies to determine the value of Alaska's Seafood Industry (see for example McDowell 2015).

4. The University of Alaska Institute of Social and Economic Research conducts research on economics Alaska's fisheries (see for example Knapp 2011).

5. The CFEC publishes research on the optimum number of permits that should be issued for a fishery (see for example Schelle et al. 2004).

6. The Division of Subsistence publishes numerous papers on the history and current use of salmon for subsistence (see for example Hiroko et al. 2013 and Marchioni et al. 2013).

The University of Alaska https://www.uaf.edu/sfos/research/fisheries/ provides bachelor, masters and doctoral programs in fisheries science, associate degrees and certificates in fisheries technology. University faculty supervise graduate student research on a broad array of biological topics including quantitative stock assessment, biology and ecology of marine and freshwater species, molecular genetics, behavioural ecology and related topics. Facilities are located across Alaska in Juneau, Seward, Kodiak and Fairbanks.

The KSMSC researches the biochemistry and nutritional value of seafood (Oliveira et al. 2010) among other topics.

The ADFG has an outstanding institutional building structure and function. The heart of the system is a structure where students can enter the Department as seasonal employees to gain field or laboratory experience as technicians. Upon graduation with a bachelors' (or higher) degree , entry level positions at the Biologist 1 or 2 level are employed in development positions to assist area management or research biologist. Fishery Biologist 3's are responsible for leading the management at the area office, supervising research programs at the area office, or for conducting specialized research at the regional level. Fishery Biologist 4's coordinate and supervises the overall management of research programs at the regional offices and in headquarters. The highest levels are statewide specialized positions such as the statewide Fishery Scientists for Salmon, Chief Biometrician and the Chief Fishery Scientist. In the management track, biologist can rise to be a Regional Supervisor, Deputy Director or Director.

The development of the internet and the commitment of the above named institutions to effectively employ its capability has ensured that study results are made easily and quickly available

5.2. The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting

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from fishing pressure, pollution or habitat alteration shall be monitored.

Evidence:

Alaska's salmon stock assessment program is extensive and comprehensive. The program to determine the number caught and their composition is explained in Clause 4.1 and 4.1.1. Research capacity in environmental science is also discussed in Clause 5.1.2. The program to estimate escapements and to set goals is explained in Clause 6.1, 6.2 and 6.3.

In addition to its permitting responsibilities, the Habitat Division performs research to monitor or evaluate the potential effects of development projects (see for example Brewster 2016). The Sport Fish Division strategic plan (ADFG- SF, 2015) prioritizes habitat research. The Sport Divisions also operates the Katchemak Bay Research Reserve http://www.adfg.alaska.gov/index.cfm?adfg=kbrr_research.home which includes programs related to the effects of climate change, changes in sea level and marine and freshwater temperatures, frequency of storm events, long-term drying trends, rapid loss of coastal glaciers and coastal uplift.

The HCD responsibilities include conducting and/or reviewing environmental analyses for a large variety of activities including commercial fishing, coastal development, and large transportation and energy projects. The HCD focuses on activities in habitats (see for example NOAA 2013) used by federally managed fish species located offshore, nearshore, in estuaries and in freshwater areas important to anadromous salmon. NOAA administers the Saltonstall-Kennedy grant program for fisheries research and development (http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm) to support fisheries research and development. NOAA also administers the Pacific Coastal Salmon Recovery Fund (http://www.nwr.noaa.gov/Salmon-Recovery- Planning/PCSRF/Index.cfm) that was established by Congress to provide funding to states and tribes of the Pacific Coast Region to protect, restore, and conserve Pacific salmon and steelhead populations and their habitats.

The USFWS has recognized climate change as a potential driver in aquatic systems and supports research into the possible effects (see for example Prucha et al. 2012). The University of Alaska's Climate Research Center http://climate.gi.alaska.edu/Climate conducts basic climate research useful for understanding potential impacts on aquatic systems (see for example Wendler et al. 2015).

The North Pacific Research Board (NPRB) (http://www.nprb.org/index.html/) distributes monies from the earnings of the Environmental Improvement and Restoration Fund, created by congress to "...conduct research activities on, or relating to the fisheries or marine ecosystems in the north Pacific Ocean, Bering Sea, and Arctic Ocean (including any lesser related bodies of water).... [With]...priority on cooperative research efforts designed to address pressing fishery management or marine ecosystem information needs." the
Bering Sea Integrated Ecosystem Research Program (http://bsierp.nprb.org/) which is a partnership between the NPRB and the National Science Foundation, funds research and ecosystem modelling to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. The Gulf of Alaska Integrated Ecosystem Research Project (http://gulfofalaska.nprb.org/index.html/) seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals and seabirds within the Gulf of Alaska.

Over time, many factors (i.e. climate or environmental change, fishing pressure habitat alteration or pollution) can affect the state of a stock. Even if specific causal relationships cannot be determined for such changes, there is a very strong stock assessment program and a process in place to periodically review and update the status of

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the stocks and escapement goals every three years through the BoF

5.3. Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.

Evidence:

The State of Alaska participates in the three international organizations that support and encourage research on salmon in and around Alaska to ensure optimum utilization.

The NPAFC is an international, inter-governmental organization established by the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean. The member countries are Canada, Japan, Republic of Korea, Russian Federation and United States of America. To promote conservation and sustainability of anadromous stocks, the NPAFC conducts regular meetings and communications in the areas of fisheries enforcement and scientific research http://www.npafc.org/new/about_npafc.html.

The Yukon River Panel was established as Attachment B, Annex IV, Chapter 8, Pacific Salmon Treaty to develop and implement agreed research and management programs for shared salmon resources of the Yukon River specifically, the Panel;

- makes annual recommendations to the respective responsible management agencies of both countries concerning conservation and management coordination;

- sets and adjusts the annual salmon spawning escapement objectives, if necessary, based on pre-season projections, stock status and recommendations from the Joint Technical Committee and;

- oversees the use and administration of the Research and Enhancement Fund.

The Panel acts independently from other annexes under the Pacific Salmon Treaty. Panel membership includes six representatives from Alaska. The Panel meets twice a year http://yukonriverpanel.com/salmon/about/organizational-structure/. The Panel sponsors active stock assessment and research programs (see for example DeCovich and Borba 2014).

The Pacific Salmon Treaty between Canada and the United states was signed in 1985 and established a Commission, Panels and Technical Committees to develop agreed fishing regimes and monitor performance. The Commission and Panels meet two times a year (http://www.psc.org/meetings_schedule.htm). In Southeast Alaska, the harvest of Chinook salmon by all gear groups, catches at the mouths of the Transboundary Rivers and in the Northern boundary area are subject to terms of the Treaty (http://www.psc.org/pubs/treaty/treaty.pdf). The treaty process provides for policy guidance by sanctioning Panels to address management issues in each covered fishing area and for Joint Technical Committees to provide annual stock assessment and enhancement information. Alaskans serve on the Commission, Panels and Joint Technical Committees. Stock assessment and research activities of the Joint Technical Committees are reported to the Panels and Commission each year (see for example TCBN 2016).

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Alaska's salmon stock assessment program is extensive and comprehensive. The program to determine the number caught and their composition is explained in Clause 4.1 and 4.1.1. Research capacity in environmental science is also discussed in Clause 5.1.2. The program to estimate escapements and to set goals is explained in Clause 6.1, 6.2 and 6.3.

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The NPRB (http://www.nprb.org/index.html/) distributes monies from the earnings of the Environmental Improvement and Restoration Fund, created by congress to "...conduct research activities on, or relating to the fisheries or marine ecosystems in the north Pacific Ocean, Bering Sea, and Arctic Ocean (including any lesser related bodies of water).... [With]...priority on cooperative research efforts designed to address pressing fishery management or marine ecosystem information needs." The Bering Sea Integrated Ecosystem Research Program (http://bsierp.nprb.org/) which is a partnership between the NPRB and the National Science Foundation, funds research and ecosystem modelling to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. The Gulf of Alaska Integrated Ecosystem Research Project (http://gulfofalaska.nprb.org/index.html/) seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals and seabirds within the Gulf of Alaska.

Over time, many factors (i.e. climate or environmental change, fishing pressure habitat alteration or pollution) can affect the state of a stock. Even if specific causal relationships cannot be determined for such changes, there is a very strong stock assessment program and a process in place to periodically review and update the status of the stocks and escapement goals every three years through the Board of Fisheries

5.4. The fishery management organizations shall directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment and status of trans-boundary aquatic stocks.

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The Pacific Salmon Commission's Technical Committees, Yukon Panel Technical Committee and NPAFC develop collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks, see Clause 5.3 for details.

5.5. Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

By Alaska Statute (16.05.815 Confidential Nature of Certain Reports and Records), except for certain circumstances, all records obtained by the state concerning the landing of fish, shellfish, or fishery products and annual statistical reports of fishermen, buyers, and processors may not be released. To ensure confidentiality, fishery data are routinely redacted from ADFG reports if the data for a time/area strata were obtained from a small number of participants (see for example Weiland et al., 2003).


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## 7.3. Section C. The Precautionary Approach

### 7.3.1. Fundamental Clause 6

**The current state of the stock shall be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded.**

| | |
|---|---|
| **Number of Supporting clauses** | **4** |
| **Supporting clauses applicable** | **4** |
| **Supporting clauses not applicable** | **0** |
| **Overall level of conformity** | **Full Conformity** |
| **Non Conformances** | **0** |

**Summarized Evidence:**

6.1/6.2/6.3/6.4 States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), shall measure the status of the stock against these reference points and agree to actions to be undertaken if reference points are exceeded.

*6.1 States shall establish safe target reference point(s) for management*

Escapement goals are the primary reference points for Alaska salmon management. The Policy for Statewide Salmon Escapement Goals (5AAC 39.223) defines the types of escapements goals that may be established and the role of the ADFG and Board of Fisheries in setting and reviewing goals.

1. A Biological Escapement Goal (BEG) is defined as an escapement range that provides the greatest potential for maximum sustained yield. Once established, a BEG becomes the primary management objective unless the Board of Fisheries establishes an optimal escapement or in-river run goal. A BEG is developed with age specific data for a stock's catch and escapement over a series of years. Typically, a Ricker type stock – recruitment function is used to establish the BEG. ADFG seeks to maintain evenly distributed salmon escapements within the range.

2. A Sustainable Escapement Goal (SEG) is defined as a level of escapement, indicated by an index or a range of escapement estimates that is known to have provided for sustained yield over a 5 to 10 year period. A SEG is used in situations where a BEG cannot be estimated because there is no stock-specific catch estimate. Once established, a SEG becomes the primary management objective unless an optimal escapement or in-river run goal has been adopted by the Board of Fisheries. An SEG is stated as a range that takes into account data uncertainty. The ADFG seeks to maintain escapements within the bounds of the SEG.

3. A Sustained Escapement Threshold (SET) is defined as a threshold level of escapement below which the ability of the salmon stock to sustain itself is jeopardized. In practice, an SET can be estimated based on the lower range of historical escapement levels for which the salmon stock has consistently demonstrated the ability to sustain itself. A SET is lower than the lower bound of the BEG and lower than the lower bound of the SEG. An SET is established by the ADFG, in consultation with the Board of Fish, as needed, for salmon stocks of management or conservation concern.

4. In special circumstances, the BoF may determine it is appropriate to establish an optimum escapement goal (OEG). If the board establishes an OEG, it must provide an explanation of the reasons, and with the

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assistance of the department, an estimate of expected differences in production relative to maximum sustained yield.

5. The BoF may also establish an in-river escapement goal to provide for harvest in addition to escapement.

Escapement goals may be established for individual stocks when stock-specific catch and escapement data are available. Bristol Bay sockeye provide a good example of where goals have been set for individual stocks (Erickson et al. 2015). in cases where catches cannot be assigned to a stock, an escapement goal for a group of stocks in a management are may be developed. A good example of where an escapement goal has been set for a geographic area is for pink salmon along the south side of the Alaska Peninsula (Schaberg et al. 2015).

A variety of methods are used to develop escapement goals (Munro and Volk 2015). A brief description of each is summarized below. The most commonly used methods are listed first, followed by the less common methods.

1. Spawner-Recruit Analysis: Analysis of the relationship between the number of fish in the escapement and subsequent production of adults in the next generation. The Ricker type production model is almost exclusively used.

2. Percentile Method**:** This method is used for establishing sustainable escapement goals and contrasts observed annual escapements (largest escapement divided by smallest escapement) and the exploitation rate of a stock to select percentiles of observed escapements for estimating lower and upper bounds of the goal.

3. Risk Analysis: Risks Analysis evaluates the magnitude of management error in future years around a precautionary reference point established using past observations of escapement (Bernard et al. 2009). This method is primarily used to guide establishment of a lower-bound SEG for non-targeted stocks of salmon.

4. Yield Analysis: Graphical or tabular examination of yields produced from observed escapement indices from which the escapement range with the greatest yields is identified (Hilborn and Walters 1992).

5. Theoretical Spawner-Recruit Analysis: This method is used in situations where there are few or no stock specific harvest estimates and/or age data. Information from nearby stocks, or generalizations about the species, are used in a spawner-recruit production model to estimate the number of spawners needed to achieve maximum sustained yield (Clark 2005).

6. Empirical Observation: Goals are based on observed escapements over time and may be calculated as the average escapement or the value of a low escapement for which there is evidence that the stock is able to recover (ADFG 2004).

7. Zooplankton Model: This model estimates the number of sockeye salmon smolts of a threshold or optimal size that a lake can support based upon measures of zooplankton biomass and surface area of the lake. Adult production is then estimated from marine survival rates over a range of smolt sizes (Koenings and Kyle 1997).

8. Spawning Habitat Model: Estimates of spawning capacity or number of spawners that produce maximum sustained yield (see for example Burgner et al. 1969).

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9. Euphotic Volume Model: Measurement of the volume of a lake where sufficient light penetrates to support primary production is used to estimate sockeye salmon smolt biomass carrying capacity from which adult production is then estimated using marine survival rates (Koening and Burkett 1987).

10. Lake Surface Area**:** Similar to spawning habitat models, the relationship between the lake surface area and escapement are used to estimate adult sockeye salmon production (Nelson 2006).

11. Conditional Sustained Yield Analysis: Observed escapement indices and harvest are used to estimate if, on average, surplus production results from a particular goal range (Nelson et al. 2005). Estimated yields are conditioned on extreme values of measurement error in the escapement indices.

12. Brood Interaction Simulation Model: This model simulates production using a spawner–recruit relationship that modifies the simulated production for the year of return using an age-structured sub-model and estimates resulting catches and escapements under user-specified harvest strategies (Carlson et al. 1999). This is a hybrid of a theoretical SRA and yield analysis that has only been used to develop the escapement goal for Kenai River sockeye salmon.

Recognizing the variety of methods used and quality of data available to establish an escapement goal, ADFG developed a rating system to convey their confidence in each goal (Munro and Volk 2015).

- The highest rating is given when accurate estimates of escapement (by age) and stock-specific catch (by age) are available to develop a BEG.

- A good rating is given when fair to good accuracy and precision of estimates of escapement from mark-recapture experiments or multiple foot/aerial surveys and escapement and age estimates are available ( but may have gaps) to develop a BEG or SEG.

- A fair rating is given when fair to good accuracy of escapement estimates are available but some estimates are missing or inadequate, and age estimates are missing or incomplete, but sufficient data exists to estimate a sustainable escapement goal.

- A poor rating is given when fair accuracy in escapement counts or index data (e.g., single foot/aerial survey) is available, but no harvest or age data is available to allow development of a SEG.

The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) directs ADFG to provide the BoF with reports on the status of salmon stocks and identify any salmon stock that is not producing at the expected level. The policy defines three levels of concern.

1. Yield Concern: A stock of yield concern is defined as "a concern arising from a chronic inability, despite the use of specific management measures, to maintain specific yields or harvestable surpluses above a stock's escapement needs.

2. Management Concern: A stock of management concern is defined as “a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a salmon stock within the bounds of the SEG, BEG, OEG, or other specified management objectives for the fishery.

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3. Conservation Concern: A stock of conservation concern is defined as “a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a stock above a SET.

Among other things, the Sustainable Salmon Policy (5AAC 39.222 ) requires fisheries be managed in a precautionary manner to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning as follows:

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

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

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

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

Escapement goals for a management area are reviewed every three years (see for example Erickson et al. 2015). Details about how escapements were determined each year are typically provided in annual management report (see for example Wilburn and Stump 206). Each year ADFG publishes a summary of adopted escapement goals and a 10 year history of performance in meeting these goals (Munro and Volk 2015). There are currently 295 active salmon stock escapement goals in the state.

6.2 States shall establish safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions should be taken to decrease the fishing mortality (or its proxy) below that limit reference point.

Almost all of Alaska’s escapement goals (whether BEGs, SEGs, or OEGs) are established as a range (see Clause 6.1). A few stocks with SETs) have only a lower limit. The lower end of each range, or SET is essentially a limit reference point, because all fisheries must, by regulation (5AAC 39.222) be managed to provide escapements that are above the lower end of the escapement goal range.

Prior to each season, the ADFG publishes management plans that outline expectations of run size and the management strategy for the upcoming season. The Management Plan for Southeast Alaska’s District 15 gillnet fishery (Gray et al. 2016) illustrates the intent to manage the fishery so as to obtain escapement goals.

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> "In 2016, ADF&G intends to manage the summer Lynn Canal drift gillnet fishery to obtain escapements within the established escapement goal ranges for all salmon stocks. Area, time, and gear restrictions will be in place during the first two or three weeks of the summer season to protect projected poor returns of Chilkat River king salmon. The department intends to manage the fishery to minimize harvest of wild stock summer chum salmon while harvesting returns of hatchery chum salmon in Section 15-C. The fall Lynn Canal drift gillnet fishery will be managed to conserve Klehini River (early-run) fall chum salmon while providing opportunity to harvest Chilkat River fall chum and coho salmon if run strength indicates a harvestable surplus based on the size of the run as measured in the lower Chilkat River fish wheels."

Post season, annual management reports detail how the season unfolded as stock assessment data became available. A summary of the early sockeye season at Chignik in 2015 illustrates how ADFG uses stock assessment data to ensure escapement goals are met (Wilburn and Stumpf 2016).

> "The Chignik weir was completed on May 18 at approximately 6:00 PM, with the first full day of escapement enumeration on May 19. Sockeye salmon escapement into the Chignik River in early to mid-June was below average and began tracking near the upper mid-range of the escapement goal around June 20 (Tables 1, 3, and 4). Results from 4 test fisheries conducted on June 12, 14, 17 and 19 in Chignik Lagoon also indicated that there was no build-up of sockeye salmon in the lagoon. Fish harvested in the test fish were predominately males and smaller than average. Based on the test fisheries results and that escapement numbers were not increasing as anticipated, the Chignik Bay and Central districts remained closed to commercial salmon fishing during most of June. After several days of strong escapement, the Chignik Bay and Central districts opened to commercial salmon fishing on June 24 at 9:30 AM for 48 hours. In addition, an increase in the female proportion of the run was observed from escapement samples taken at the weir. This initial fishing period was extended an additional 72 hours and then closed for 48 hours to allow additional escapement into the Chignik River."

Perhaps the best evidence that the ADGF takes management action to achieve escapement goals is the fact that escapement goals are generally attained state-wide, Munro and Volk 2015.

6.3 Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration shall not be overfished (i.e. above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing.

Alaska has a large and ongoing stock assessment program to obtain the extensive scientific information necessary to measure the status of the stocks being fished in relation to their escapement goals and allow managers to impose any needed management actions to alter fisheries so as to achieve those escapement goals, (see Clauses 4.1, 4.1.1, 5.1.2, 5.2, 5.3 and 6.1). These stock assessment programs collect:

1. escapement data using counting towers, weirs, aerial and foot surveys, sonar or mark- recapture abundance estimates;

2. age, sex, size, data from escapements and well as marks and tags to help determine stock and year of origin;

3. catch and catch per unit of effort by gear, time and area;

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4. age, sex and size of the harvest, and recovery marks, tags and biological samples to determine the stock of origin;

5. Environmental data such as river discharge and water quality.

Data needed to manage the fisheries is obtained, synthesized and interpreted in-season by area research and management staff. Emergency Orders are issued to describe the area, time and gear allowed for fishing if surplus production is identified. Every three years, escapement goals are reviewed to account for any changes in productivity.

Stock Status thru 2016

The 2016 commercial harvest of salmon in Alaska reflected a continuing pattern of strong returns seen in recent years (Figure *1* and Table *1*). Harvests in 2016 reflected strong Pink Salmon returns to the south side of the Alaska Peninsula, Kodiak, Prince William Sound and Southeast and Sockeye Salmon returns to Bristol Bay.

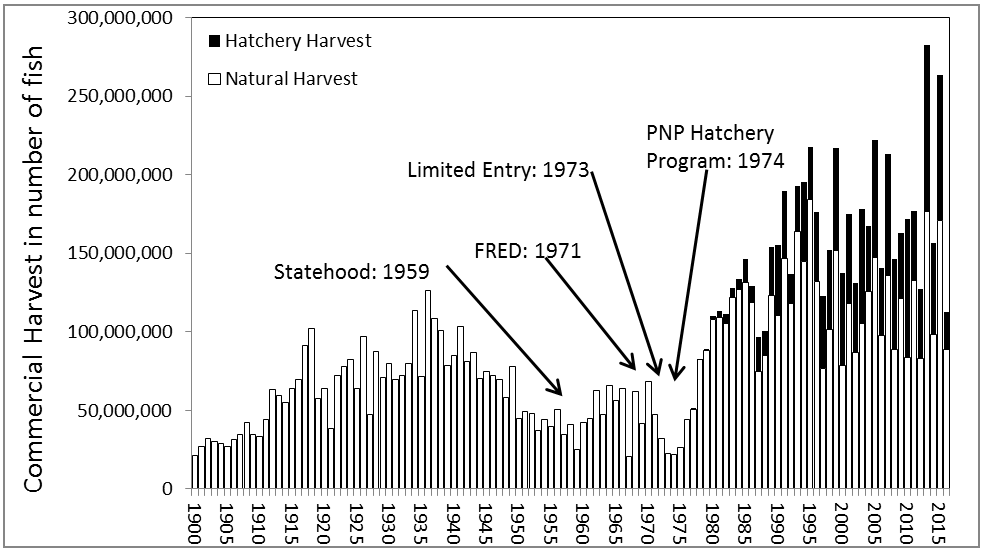


Figure 1. Historic commercial catch of salmon in Alaska showing the contribution of fish from enhancement activities, 1900 – 2016 (from Stopha 2017).

Table 1 Preliminary 2016 Alaska commercial salmon harvests, by fishing area and species, in thousands of fish

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(Brenner and Munro 2017).

| Fishing Area | Species | | | | | Total |
|---|---|---|---|---|---|---|
| | Chinook | Sockeye | Coho | Pink | Chum | |
| Southeast Region Total[a] | 337 | 1,506 | 2,331 | 18,400 | 9,118 | 31,692 |
| Prince William Sound | 13 | 1,989 | 484 | 13,051 | 3,172 | 18,710 |
| Lower Cook Inlet[b] | 1 | 258 | 2 | 100 | 74 | 434 |
| Upper Cook Inlet | 10 | 2,397 | 147 | 382 | 124 | 3,060 |
| Bristol Bay | 30 | 37,330 | 91 | 752 | 1,042 | 39,245 |
| Central Region Total | 54 | 41,974 | 724 | 14,285 | 4,412 | 61,450 |
| Kodiak Area | 7 | 2,064 | 207 | 3,200 | 404 | 5,881 |
| Chignik | 21 | 1,386 | 94 | 141 | 118 | 1,760 |
| South Peninsula and Aleutians | 13 | 2,478 | 185 | 2,871 | 424 | 5,972 |
| North Peninsula | 2 | 3,503 | 76 | 12 | 89 | 3,682 |
| Westward Region Total | 44 | 9,430 | 562 | 6,224 | 1,036 | 17,296 |
| Arctic-Yukon-Kuskokwim Region Total | 0 | 3 | 304 | 336 | 1,443 | 2,086 |
| Total Alaska | 434 | 52,914 | 3,922 | 39,246 | 16,008 | 112,524 |

*Note*: Missing data indicates no harvest, and zeros indicate harvest activity but <500 fish.

*Note*: Columns may not total exactly due to rounding.

[a] Total commercial harvest of Chinook salmon for the October 1, 2015–September 30, 2016 catch accounting period.

[b] Commercial harvest in Lower Cook Inlet includes commercial common property and hatchery cost-recovery harvest, but not homepack, broodstock, or hatchery donated fish.

**Catch and Escapement Update by Species**

Catch data are provided for each species by management area; escapement data are provided by species and region with notations regarding significant differences between management areas. The catch data are presented as numbers of fish, and where available, the preseason forecast. Trends in escapement for the period 2006 - 2016 are shown as; 1) the estimated number escaping to spawn each year for systems that had estimates in that year (the range in the number of systems with estimates within the time frame is shown in the graph title), 2) the combined escapement goal for the systems that were surveyed each year and, 3) the percent of stocks that were surveyed each year that met or exceeded the lower bound of its escapement goal range. Escapement goals used in the analysis are those in place in 2016, some changes in methods may have occurred for some stocks in prior years, but the changes are believed to be small enough to not significantly affect conclusions.

**Chinook Salmon**

Recent Chinook Salmon harvests (Table *1*and Figure *2*. Trends in annual Chinook Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).*Figure 2*), have been well below the long-term average. There was little to no commercial harvest in the Yukon and Kuskokwim areas. Catches permitted under the Pacific Salmon Treaty in Southeast Alaska rebounded substantially because far north migrating stocks that spawn in the Pacific Northwest and Southern British Columbia were healthy. To address concerns for poor productivity of Chinook Salmon stocks the state embarked on a major research project to understand the reason(s) for the decline. http://www.adfg.alaska.gov/index.cfm?adfg=chinookinitiative.main

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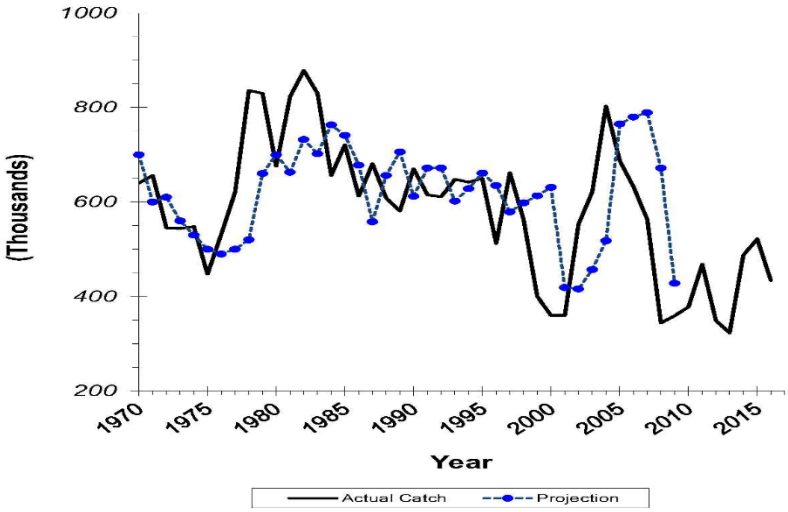


Figure 2. Trends in annual Chinook Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).

Except for one small stock in Norton Sound, and two small stocks in Kuskokwim Bay, the Yukon and Kuskokwim rivers are the only stocks with escapement goals in the AYK Region. Yukon escapement goals are based on achieving a number of fish into the Canadian portion of the river and for observed numbers in three tributaries in the Alaska portion of the drainage. Escapements into the Kuskokwim are based on achieving a total number for the entire river (there are also goals for individual stocks within the Kuskokwim). Escapements in the AYK Region (Figure 3) have rebounded substantially since the period from 2010 to 2013. Escapement goals into the Canadian portion of the Yukon River have been met for the last three years.

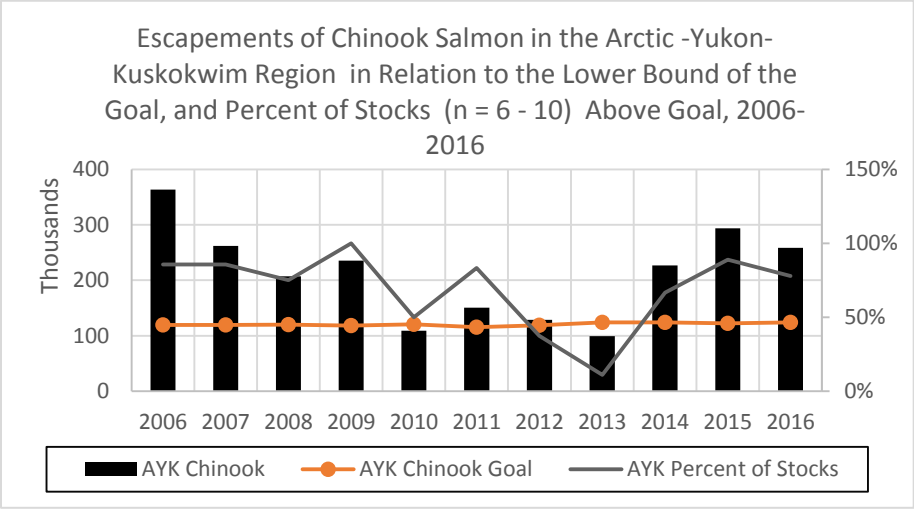


Figure 3. Escapements of Chinook Salmon in the A-Y-K Region 2006 – 2017.

The primary Chinook Salmon stocks in the Central Region are the Nushagak (Bristol Bay Area), Kenai River and Susitna Rivers (Upper Cook Inlet Area), and the Copper River (Copper-Bering Area). Data are not available yet for the 2015 and 2016 runs into the Copper River or for the 2016 run into the Kenai River. There is no annual estimate made for the total run into the Susitna, but goals are established for some tributaries. In addition, there are several moderate to smaller stocks with goals in the Upper Cook Inlet Area. Currently available data show a pattern very

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similar to that observed in Western Alaska, with a sharp decline in the percent of stocks reaching their goals during the period 2010 through 2013. If recent year's data was available for the Kenai and Copper Rivers, the rebound in the total number of fish escaping would be substantially more evident.

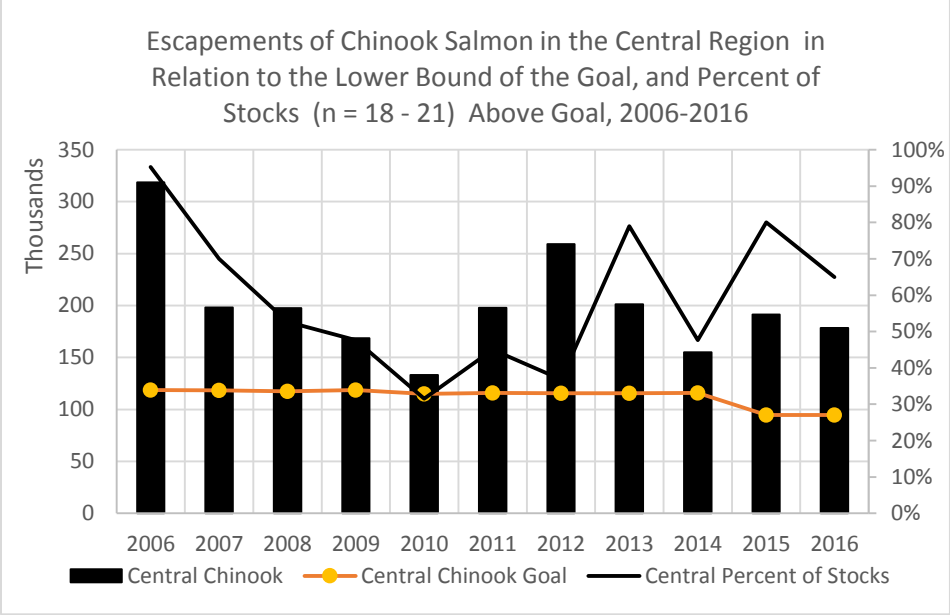


Figure 4.

Figure 4. Escapements of Chinook Salmon in the Central Region (Bristol Bay, Upper and Lower Cook Inlet, Prince William Sound and Copper-Bering Management Areas), 2006 -2016.

There are only four Chinook Salmon stocks with goals in the Westward Region (three in the Kodiak Area and one in the Chignik Area) and these runs are much smaller than those in the AYK or Central regions. These stocks are primarily caught incidentally during early season Sockeye Salmon fisheries. In recent years, time and area restrictions and non-retention and non-sale regulations have been in place in the Kodiak Area. Escapements since 2006 have been near, or below minimums for one or more of the four stocks.

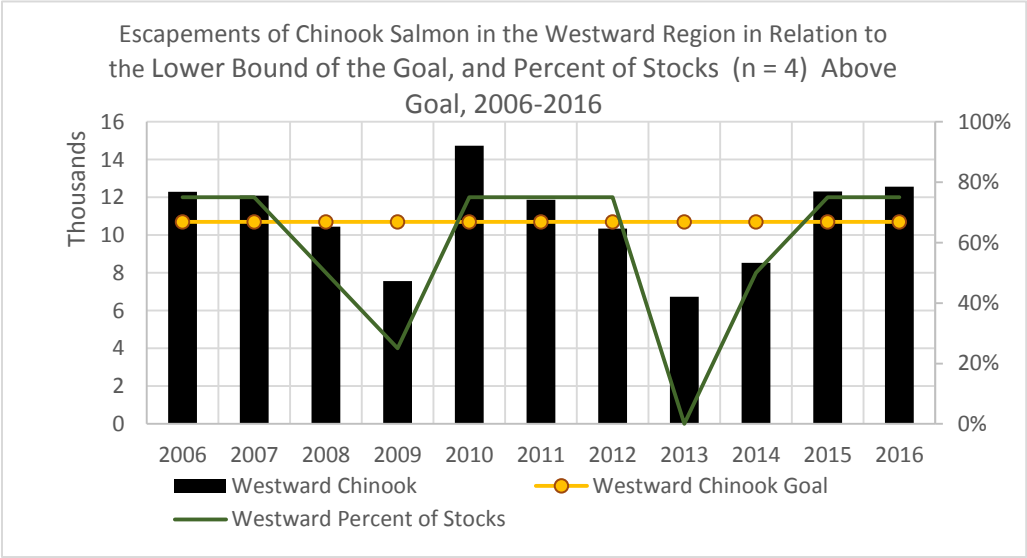


*Figure 5. Escapement of Chinook Salmon in the Westward Region (North and South Alaska Peninsula areas, Chignik and Kodiak*

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*management areas), 2006 - 2016.*

The Southeast Region has two large runs of Chinook Salmon, the Taku and Stikine rivers (Southeast Area), three moderately sized runs, the Alsek (Yakutat Area), Chilkat and Unuk Rivers (Southeast Area) and six small runs. The pronounced drop in escapements seen in other regions of the state between 2010 and 2013 was not evident in this region, but a dramatic decline occurred in 2016.

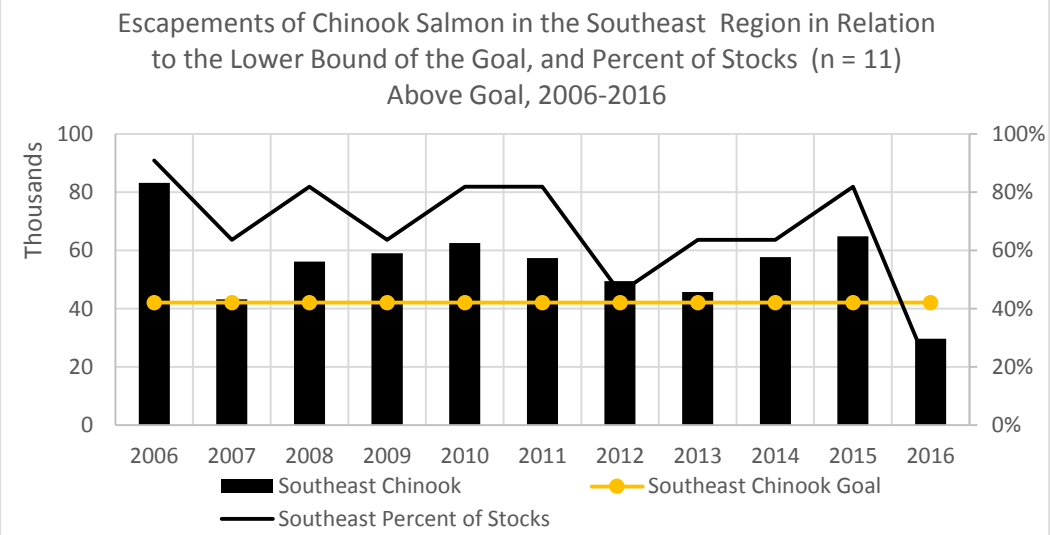


Figure 6. Escapement of Chinook Salmon in the Southeast Region (Yakutat and Southeast management areas), 2006 - 2016.

**Sockeye Salmon**

The 2016 Sockeye harvest (Table 1 and Figure 7) was well above the recent 10-year average harvest, primarily because of the strong return to Bristol Bay. Significant catches were also seen in the Alaska Peninsula, Kodiak, Upper Cook Inlet and Southeast management areas.

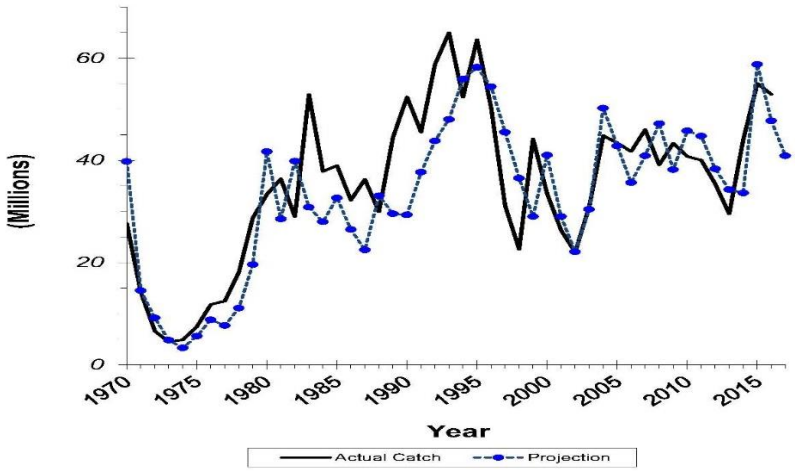


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Figure 7. Trends in annual Sockeye Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).

An exceptionally large escapement was observed in the AYK region (Figure 8) because of large return to the Kuskokwim River; there was no commercial harvest of these fish. Within the Central Region, (Figure 9) all stocks in Bristol Bay met their escapement gaols. The few stocks that failed to meet goals in the Central Region were small to medium sized runs in the Upper and Lower Cook Inlet areas, Prince William Sound and Cooper-Bering Area. Within the Westward Region (Figure 10) only one small stock on the Alaska Peninsula did not meet its escapement goal. Within the Southeast Region (Figure 11) three stocks, failed to meet their goals.

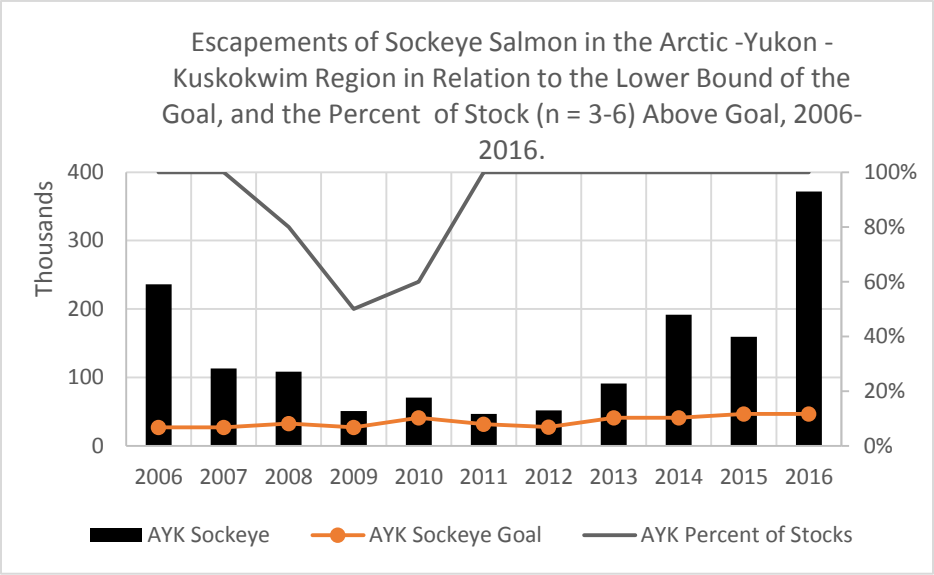


Figure 8. Escapements of Sockeye Salmon in the A-Y-K Region, 2006 -2016.

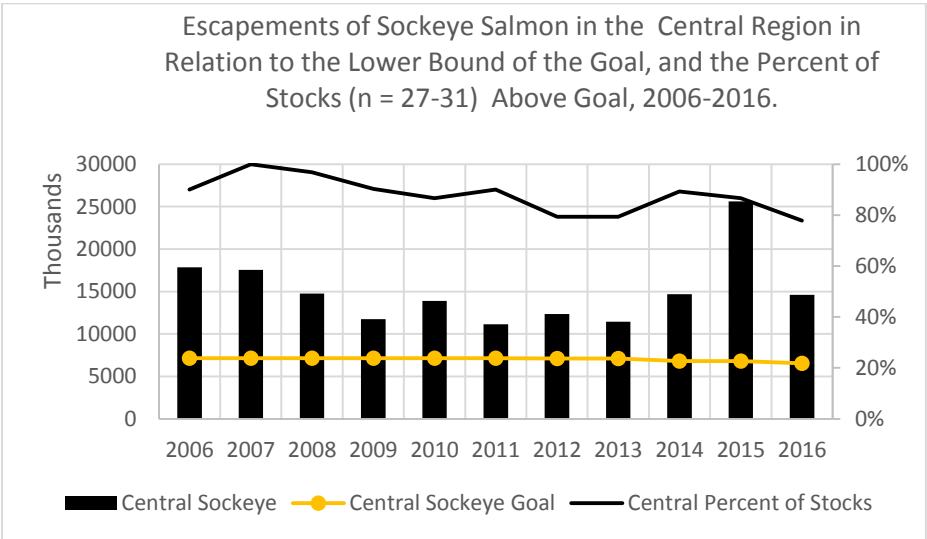


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Figure 9. Escapements of Sockeye Salmon in the Central Region, 2006 - 2016.

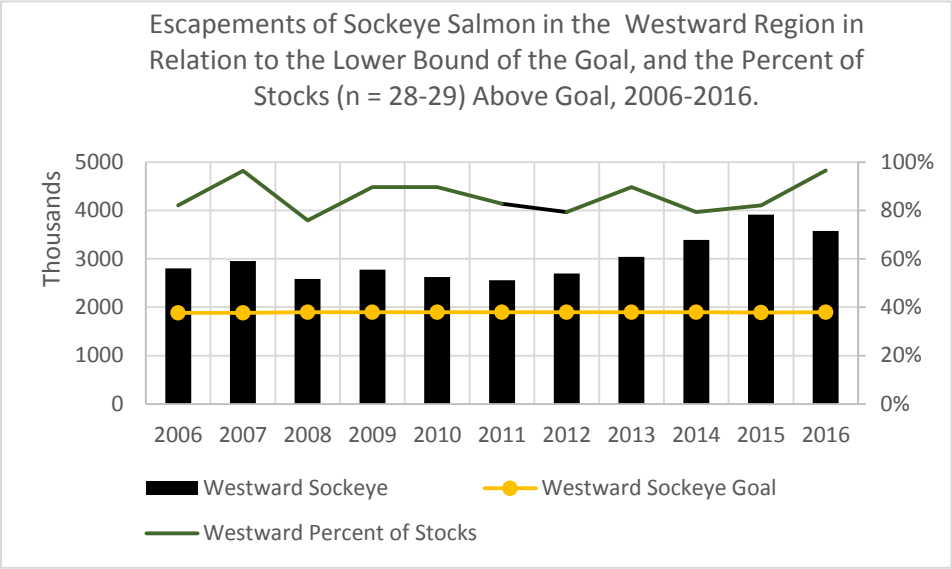


Figure 10. Escapements of Sockeye Salmon in the Westward Region, 2006 - 2016.

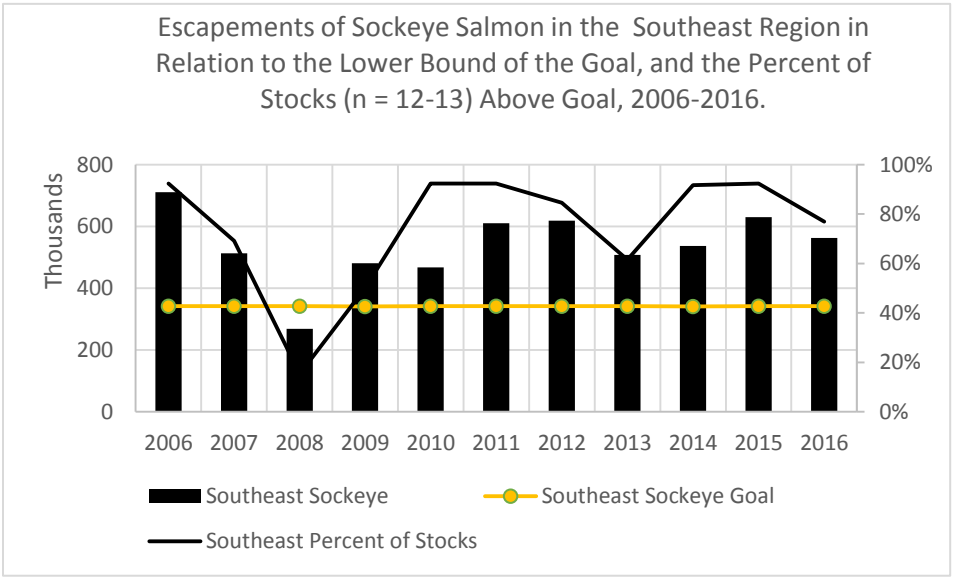


Figure 11. Escapements of Sockeye Salmon in the Southeast Region, 2006 - 2016.

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**Coho Salmon**

The catch of Coho Salmon (Table 1 and Figure 12) was similar to that observed over the last 20 years. As usual, Southeast Alaska accounted for the largest portion of the catch.

All stocks in the A-Y-K Region (Figure 13) met their escapement goal.

Within the Central Region (Figure 14), estimates of escapement were made from 2012 – 2014 for the Nushagak River and this accounts for the large numbers observed in those years. Among the large stocks in the region (Copper River, Bering River and Little Susitna River) only the Little Susitna missed its goal (10,100 fish) by only 50 fish.

Within the Westward Region (Figure 15), two of the four small stocks on Kodiak Island missed their goal, while the stocks on the Alaska Peninsula met their goals.

Within the Southeast Region (Figure 16), one large stock (Chilkat River) and two small stocks did not meet their escapement goals.

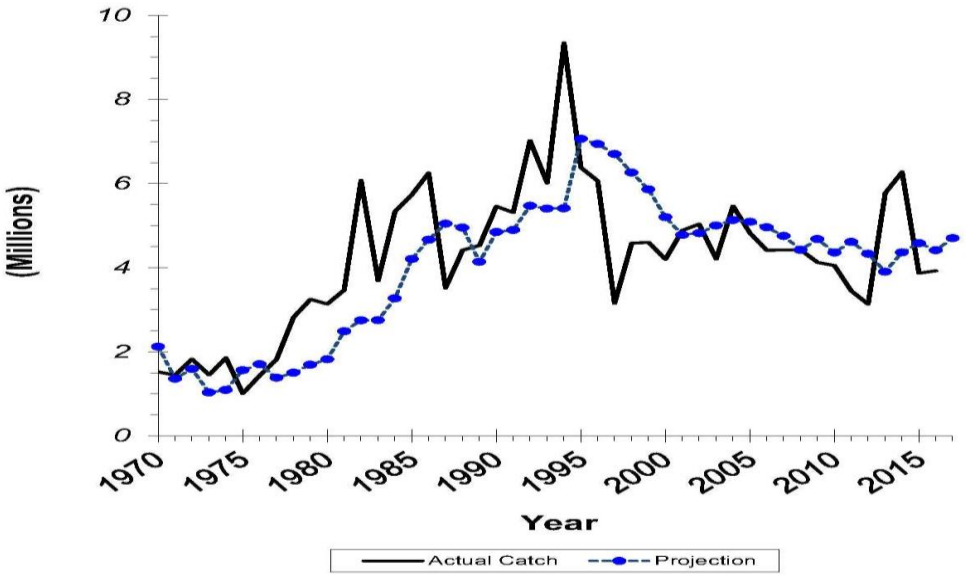


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Figure 12. Trends in annual Coho Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).

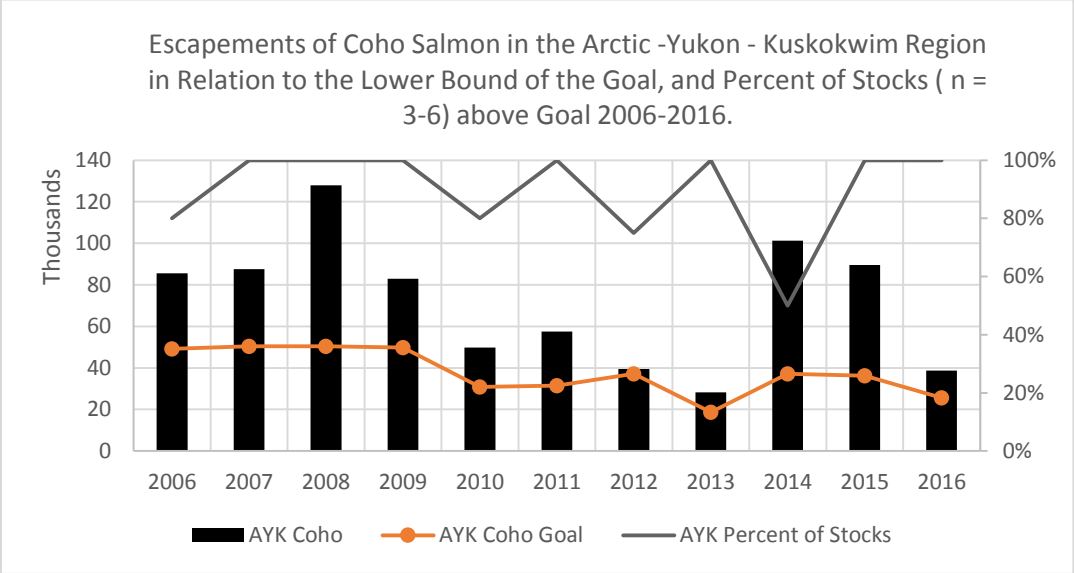


Figure 13. Escapements of Coho Salmon the A-Y-K Region, 2006 - 2016.

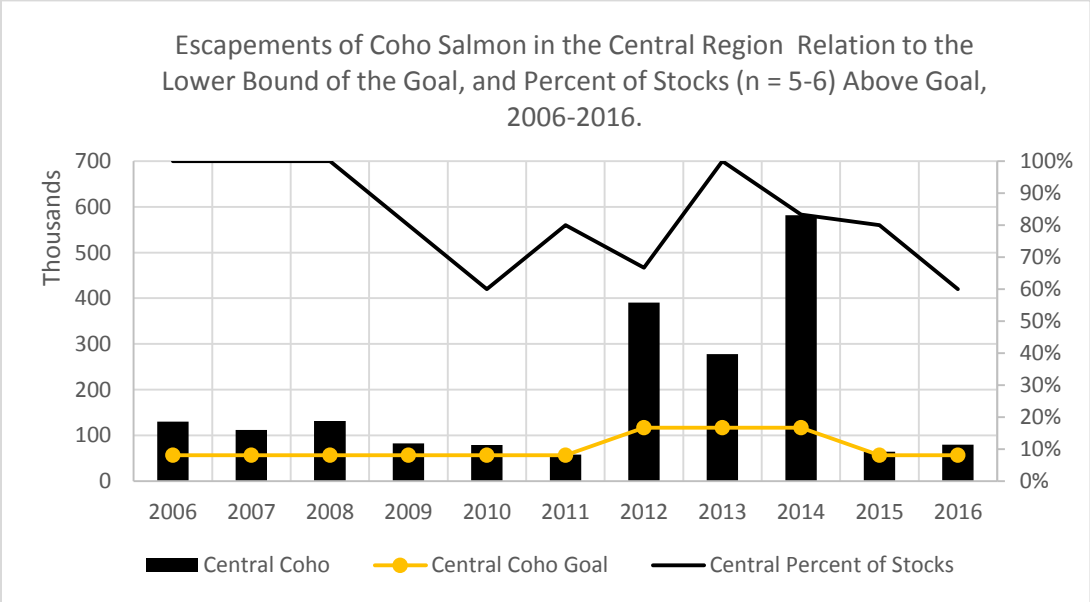


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Figure 14. Escapements of Coho Salmon in the Central Region, 2006 – 2016.

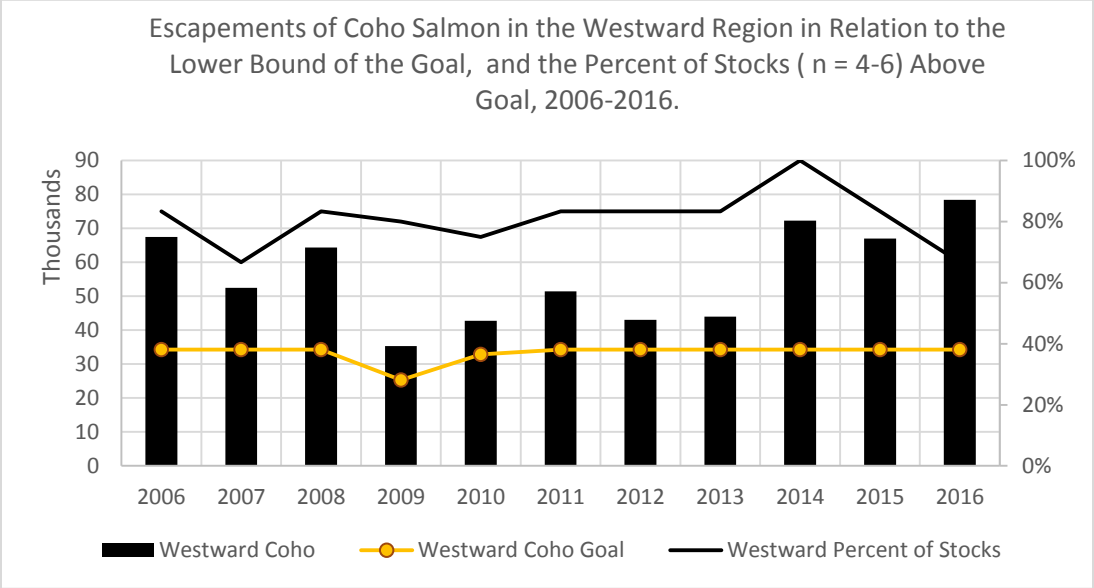


Figure 15. Escapements of Coho Salmon in the Westward Region, 2006 - 2016.

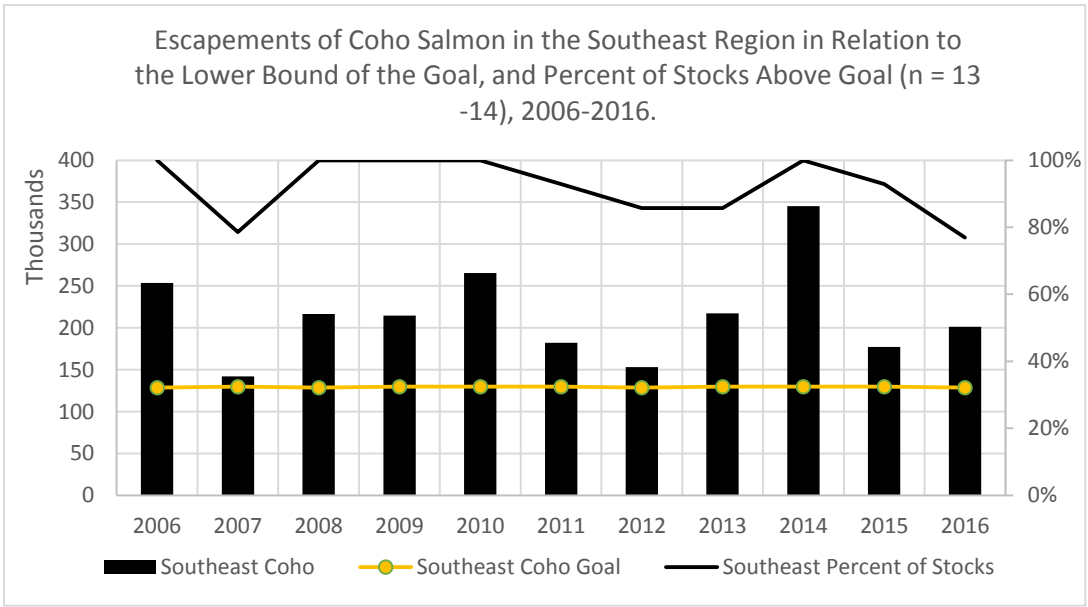


Figure 16. Escapements of Coho Salmon in the Southeast Region, 2006 -2016.

**Chum Salmon**

Catches of Chum Salmon (Figure 17) have soared since large scale enhancement came online in Southeast and Prince William Sound in the mid 1990's. In 2016, (Table 1) significant wild stock catches occurred in the AYK Region, Bristol Bay, South Peninsula and Kodiak.

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Escapements in the AYK Region were strong (Figure 18). While most stocks met their minimum escapement goal in the Central Region (Figure 19) overall numbers were much lower than seen between 2006 and 2014. This apparent decline is an artifact because no escapement data are available for the very large Nushagak River run in 2015 and 2016. Within the Westward Region, (Figure 20) only the Kodiak Area escapement was below its goal. In the Southeast Region, the large Northern Inside summer aggregate index was below goal as was the Excursion Inlet fall run.

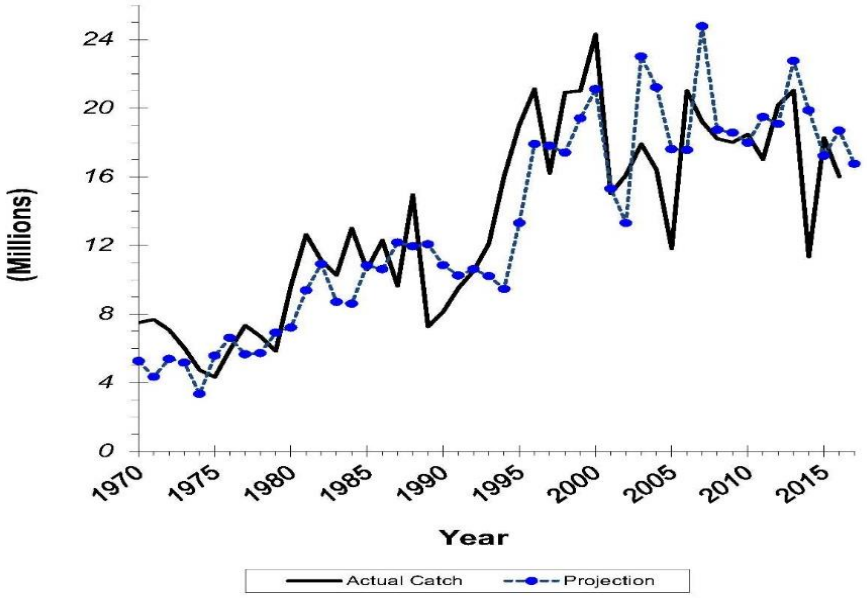


Figure 17. Trends in annual Chum Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).

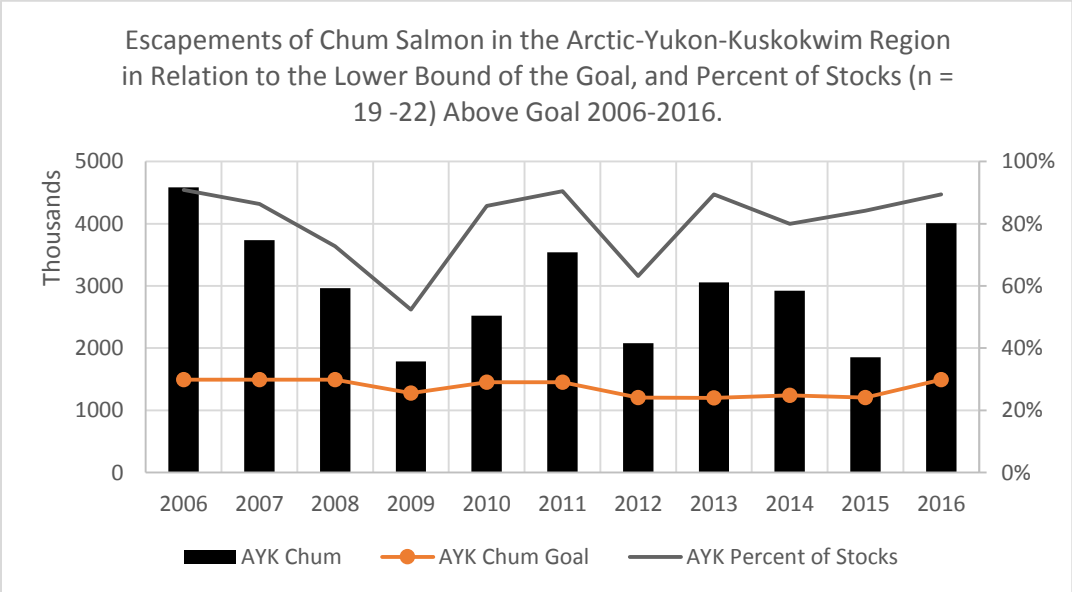


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Figure 18. Escapements of Chum Salmon in the A-Y-K Region, 2006 - 2016.

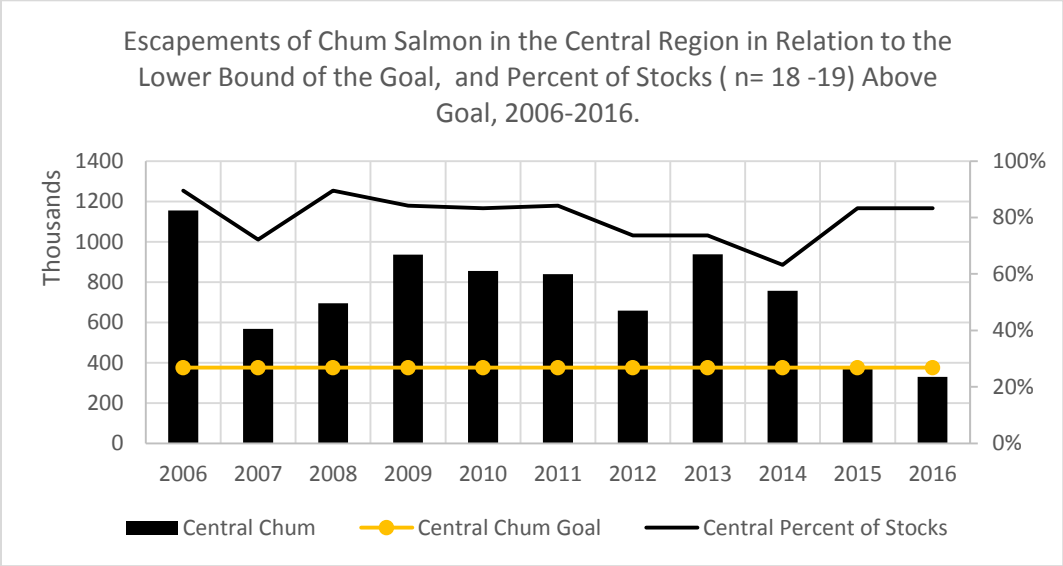


Figure 19. Escapements of Chum Salmon in the Central Region, 2006 - 2016.

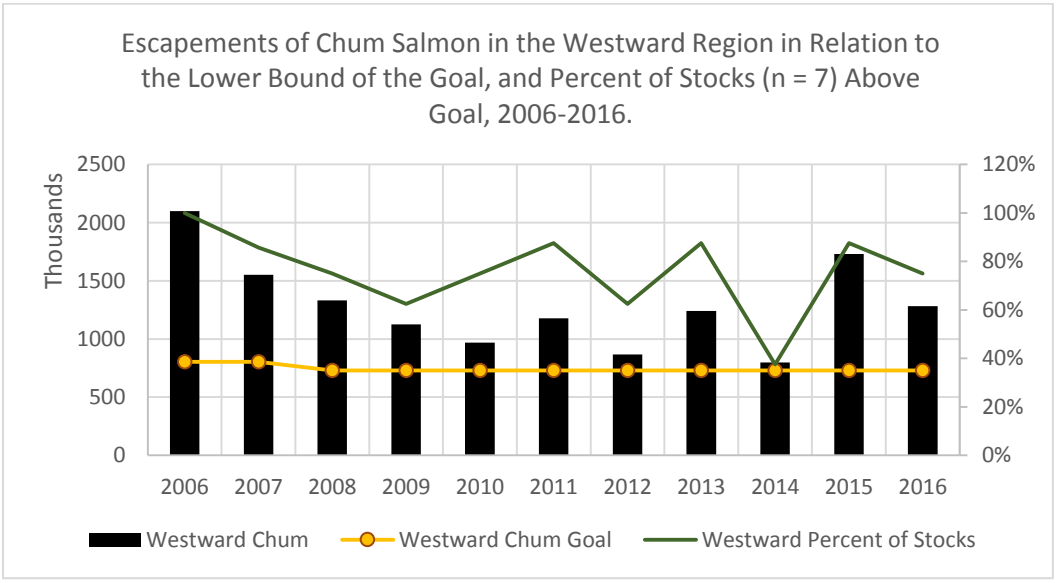


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Figure 20. Escapements of Chum Salmon in the Westward Region, 2006 – 2016.

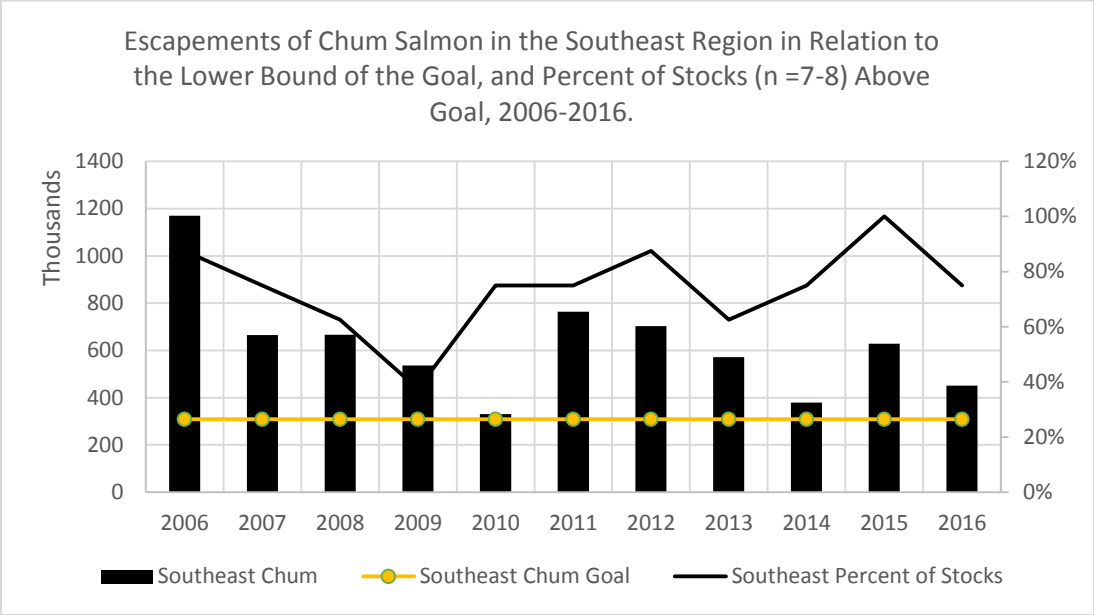


Figure 21. Escapements of Chum Salmon in the Southeast Region, 2006 -2016.

**Pink Salmon**

The Pink Salmon catch in 2016 was the lowest since the late 1970's (Figure 22). The dismal harvest in Kodiak, Prince William Sound and Southeast (Table 1) led the Governor to declare a disaster for these fisheries and seek federal aid. To not leave the reader an impression that the 2016 Pink Salmon return forebodes a long term conservation or production issue, it should be noted that the 2017 Pink Salmon harvest was the fourth largest (in pounds) in state history.

Within the AYK Region, Norton Sound is the only Management Area with Pink Salmon escapement goals, and with little commercial interest in this far northerly region, when a large run occurs, as it did in 2016, most of the fish escape to spawn (Figure 23).

Within the Central Region, Bristol Bay has one stock with an escapement goal (Nushagak River) but little commercial interest makes estimating the annual escapement a low priority and the stock was not surveyed in 2016. In the Lower Cook Inlet Management Area, 12 of the 16 individual runs did not achieve their escapement goals. Within Prince William Sound goals are set by District, and all escapement goals were met.

Within the Westward Region, Pink Salmon escapement goals are set for the entire Chignik Area and South Peninsula Area, and for the Kodiak Mainland and Kodiak Island Archipelago Districts. None of the four escapement goals were met within the Westward Region in 2016 (Figure 25).

Within the Southeast Region (Figure 26) there is one stock with a goal in the Yakutat Area (Situk River) and it did not meet its goal. Within the Southeast Area, there are three aggregate goals, the goals for the Southern portion

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of the region and for the Northern Outside portion met their goals while the goal for the Northern Inside portion of the region failed to meet its goal.

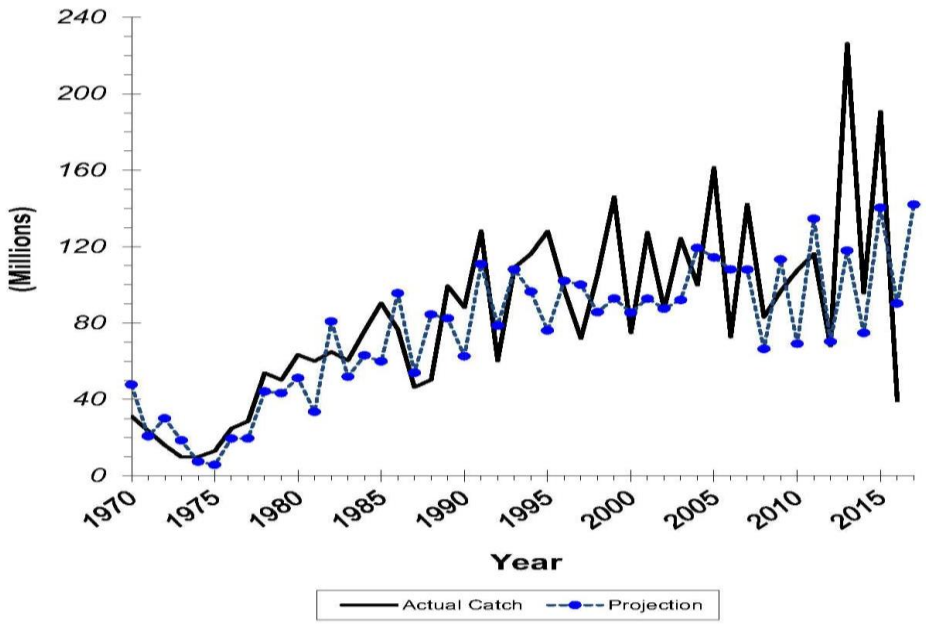


Figure 22. Trends in annual Pink Salmon harvest in Alaska commercial fisheries (Brenner & Munro 2017).

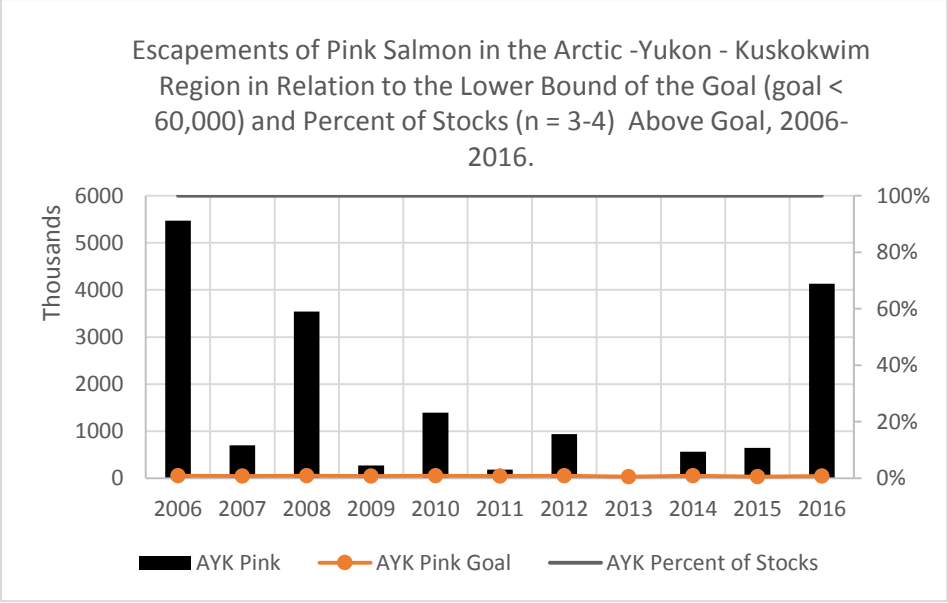


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Figure 23. Escapements of Pink Salmon in the A-Y-K Region, 2006 - 2016.

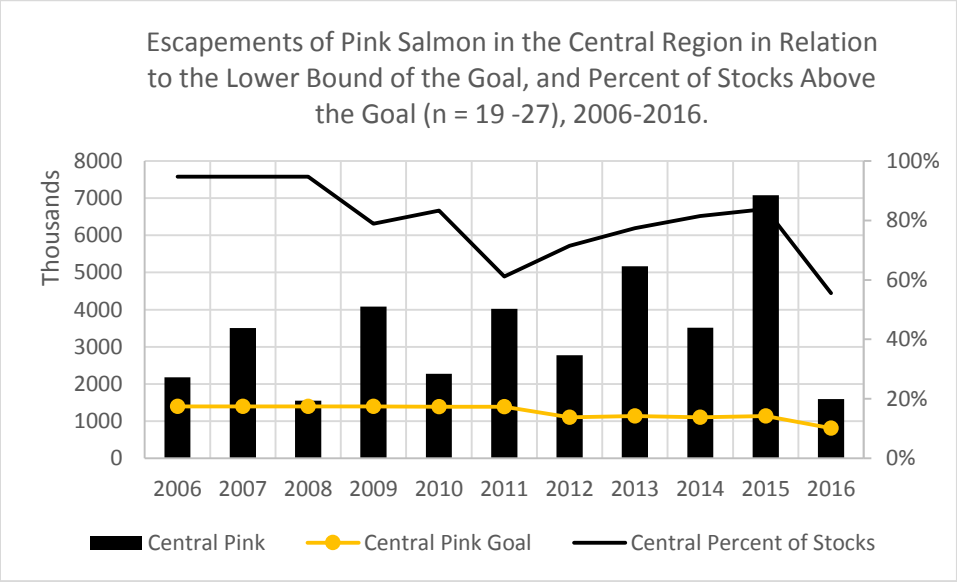


Figure 24. Escapements of Pink Salmon in the Central Region, 2006 – 2016.

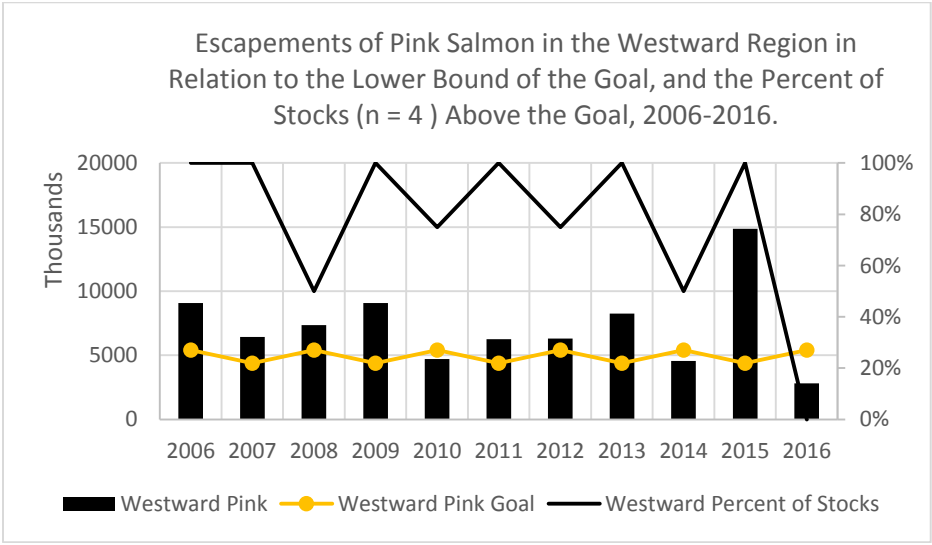


Figure 25. Escapements of Pink Salmon in the Westward Region, 2006 - 2016.

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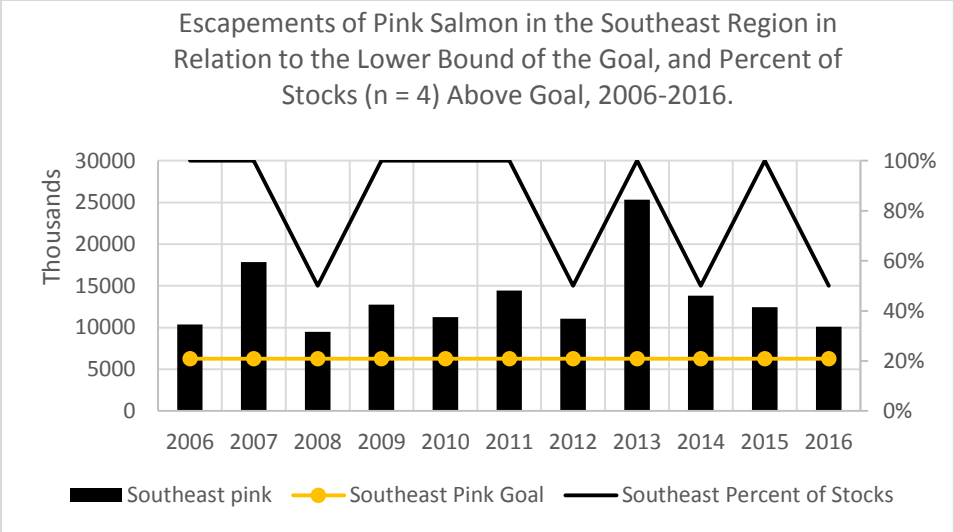


Figure 26. Escapements of Pink Salmon in the Southeast Region, 2006 – 2016.

**Stocks of Concern**

The ADFG and the BoF have a process to designate and classify a salmon stock as a "Stock of Concern" (SOC). A SOC designation may be appropriate if a stock is not meeting expectations for harvest, and/or escapement. If a stock is not consistently meeting harvest levels even though escapement levels are being met, it may be classified as a "Stock of Yield Concern". If a stock has not met its escapement goal in three of five years it may be classified a "Stock of Management Concern".

The BOF makes the designation based on a recommendation by ADFG. The SOC designation triggers the requirement to identify factors likely causing the decline, and to develop a plan to increase abundance and/or harvests. When a stock is classified as one of Yield Concern, research is typically directed at the run to better understand limiting factor(s) while ensuring management action continues to provide for escapements to remain with the goal range.

As of March 2017, there are nine stocks of management stocks of concern, and five stocks of yield concern. The ADFG nominated four additional stocks for consideration at the BoF Work Session in October 2017. Action on those nomination will take place in January 2018.
http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2017-2018/ws/rcs/rc003_ADF&G_Southeast_Stock_of_Concern_Recommendations.pdf.

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Table 2. Alaska's listing of Stocks of Concern in 2017.

**(http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.akfishstocks)**

| UoC | System | Species | Year Designated | Level of Concern | Year Last Reviewed |
|---|---|---|---|---|---|
| Cook Inlet | McNeil River | Chum | 2016 | Management | 2016 |
| UCI | Susitna (Yentna) River | Sockeye | 2007 | Yield | 2013 |
| UCI | Chuitna River | Chinook | 2010 | Management | 2013 |
| UCI | Theodore River | Chinook | 2010 | Management | 2013 |
| UCI | Lewis River | Chinook | 2010 | Management | 2013 |
| UCI | Alexander Creek | Chinook | 2010 | Management | 2013 |
| UCI | Willow Creek | Chinook | 2010 | Yield | 2013 |
| UCI | Goose Creek | Chinook | 2010 | Management | 2013 |
| UCI | Sheep Creek | Chinook | 2013 | Management | 2013 |
| Yukon | Yukon River | Chinook | 2000 | Yield | 2015 |
| Norton Sound | Norton Sound Sub-district 5 & 6 | Chinook | 2003 | Yield | 2015 |
| Norton Sound | Norton Sound Sub-district 2 & 3 | Chum | 2000 | Yield | 2015 |
| Norton Sound | Norton Sound Sub-District 1 | Chum | 2006 | Yield | 2015 |
| Kodiak | Karluk River | Chinook | 2010 | Management | 2013 |
| Peninsula/Aleutians | Swanson Lagoon | Sockeye | 2012 | Management | 2015 |

6.4 Management actions shall be agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded.

The statewide Sustainable Salmon Policy (5AAC 39.222) mandates, among other things, that escapement goals must be established for all exploited salmon stocks and that fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning. This basic policy sets the expectation among fishers that the ADFG will, as needed, exercise its statutory responsibility to manage the time and areas where fishing is allowed so as to achieve escapement goals.

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This policy also requires ADFG to provide the BoF, on a regular basis, a stock status report, a review of escapement goals and action plans that include management directives to promote recovery of any stock of concern. Examples of recent stock status and escapement goal reports presented to the BoF include Schaberg et al. 2015 for the Alaska Peninsula stocks, Conitz et al. 2015 for the Arctic-Yukon-Kuskokwim stocks and Heinl et al. 2014 for Southeast Alaska.

Further guidance and expectations for the ADFG's inseason management actions is found in the Policy for the Management of Sustainable Salmon Fisheries, "in the face of uncertainty, salmon stocks, fisheries, artificial propagation and essential habitats shall be managed conservatively" This regulation further defines the "precautionary approach" to involve consideration of; a) the uncertainties in salmon fisheries and habitat management, b) biological, social, cultural, and economic risks, c) consideration of the needs of future generations, and d) placement of the burden of proof on those activities that pose a risk to salmon habitat or production.

Often the BoF determines it is in the state's best interest to lay out specific management plans to guide the ADFG to achieve not only its biological goals but also to meet BoF allocation decisions. When this occurs, the BoF develops specific management plans. There are over 100 salmon management plans that detail the specific management actions that are to be taken to ensure that management targets are met (see http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial for ADFG commercial fish regulations by area). For example, the Situk-Ahrnklin Inlet and Lost River King Salmon Management Plan (5AAC 30.365) includes specific management actions that are to be implemented for each fishery based on the projected in-river run at the weir. The BEG for Situk River Chinook salmon is 450 – 1050 three ocean-age or older fish. The management plans calls for a stepwise procedure for closing/opening the fisheries depending upon the projected run size of Chinook salmon as follows:

- Closure of all fisheries (subsistence, sport, personal use, commercial set gillnet, and near-shore troll commercial troll fishery) if the projected in-river escapement (based on weir counts and historic run timing) is below 350 fish.

- If the projected in-river escapement is 350 – 450 Chinook salmon, the sport fishery will be closed by emergency order (EO), the commercial troll fishery may be closed by EO, the set-net fishery may be limited to "non-sale" of Chinook salmon, and weekly fishing periods for the set-net fishery may be restricted. These regulations are designed to minimize the harvest of king salmon while allowing the harvest of the sockeye salmon and retention of king salmon for subsistence use.

- If the project return is 451-730 Chinook salmon, portions of the Situk River may be closed to sport fishing for Chinook salmon or the entire river may be restricted to catch and release fishing for Chinook salmon, the commercial troll fishery may be closed by EO, the set-net fishery may be limited to "non-sale" of Chinook salmon, and weekly fishing periods for the set-net fishery may be restricted. These actions will be taken, as needed to ensure a minimum escapement of 730 Chinook salmon.

- If the projected Chinook salmon escapement is 730 – 1,050 fish, the set-net fishery will be managed based on sockeye salmon run strength, and the sport, subsistence, and commercial troll fishery will be managed based on normal fishing regulations. If the projected escapement of Chinook salmon is greater than 1,050 fish, ADFG will implement liberalized regulations to harvest the surplus of Chinook salmon above the escapement goal range.

Other examples of fishery management plans that contain pre-determined fishery management actions to meet escapement goals or other fishery targets are:

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- The Southeast Alaska King Salmon Management Plan (5AAC 47.055) contains numerous potential restrictions to the sport fishery to achieve the abundance based allocation to the sport fishery;

- The Kenai River Late-Run Sockeye Salmon Management Plan (5AAC 21.360) contains numerous potential regulatory actions to the commercial set gillnet fishery;

- The Tanana River salmon management plan (5AAC 05.367) provides guideline harvest limits for Chinook, summer chum and fall chum salmon and options for commercial fisheries based on escapement status of the runs; and

- The southern district management plan for the Alaska Peninsula (5AAC 09.360) provides management directives for the mainland fishery based on harvestable surplus of Chignik River sockeye.

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### 7.3.2. Fundamental Clause 7

**Management actions and measures for the conservation of stock and the aquatic environment shall be based on the precautionary approach. Where information is deficient a suitable method using risk assessment shall be adopted to take into account uncertainty.**

| | |
|---|---|
| **Number of Supporting clauses** | **5** |
| **Supporting clauses applicable** | **5** |
| **Supporting clauses not applicable** | **5** |
| **Overall level of conformity** | **Full Conformity** |
| **Non Conformances** | **0** |

**Summarized Evidence:**

7.1. The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment.

Alaska's policies for Sustainable Fisheries Management, embodied in the State Constitution and regulations includes, key elements of the precautionary approach for salmon fisheries and habitats. Faced with various uncertainties current evidence provided by ADFG is consistent with a conservative approach to the management of salmon stocks, fisheries, artificial propagation, and essential salmon habitats.

The Alaska Hatchery program has been operated in a highly precautionary manner as demonstrated by;

- The scope of regulations adopted to endure that wild stocks are given a priority in management;
- That fisheries are based on wild stock abundance, not hatchery stock abundance;
- that local brood stocks are used;
- that hatchery brood stock diversity practices (fish selected at random and not on external trait basis such as size, color or shape, 1 to 1 mating ratio, effective population sizes extremely large – especially true for pink and chum salmon in SEAK and PWS);
- that terminal areas are established where surplus production can be harvested;
- that collection of broodstock for the hatcheries is stratified over spawn/run timing to maximize the heterogeneity of the gene pool;
- That pathological issues are addressed;
- That fish are marked;
- That fish are not transported released without a permit and;
- That careful planning precedes issuance of a permit.

Previous reports have outlined 2 examples of concern which are:

1. Depressed runs, declining productive, and biological changes in age and size of state wide Chinook salmon populations;
2. And, concern over hatchery origin pink salmon in Prince William Sound (PWS) and hatchery origin chum salmon in Prince William Sound and Southeast Alaska (SEAK).

Regarding the Chinook salmon issue, ADFG management has limited commercial and sport fisheries and traditional subsistence harvest of Chinook salmon to meet escapement goals and international treaty obligations. These restrictions have been very effective in increasing escapements (see stock assessment section) ADFG also has undertaken a comprehensive Chinook Salmon Stock Assessment and Research Plan involving 12 key stocks in

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all regions of the state. Initial findings show that poor ocean survival has been an important limiting factor in rebuilding populations to harvestable levels. The ADFG has done an excellent job in keeping the public aware of its research findings by publishing an on-line "Chinook News Letter" http://www.adfg.alaska.gov/static/home/library/pdfs/chinooknews/cn_spring2016_n3_fulledition.pdf

To address the extent of straying the ADFG has sampled representative Chum Salmon indicator streams in Southeast, and Pink and Chum indicator streams in Prince William Sound, to estimate the hatchery fraction in natural systems on a district scale. No previous study has done this. Combining this information with estimates of relative reproductive success and of hatchery and wild productivities will allow us to assess the influence, if any, of hatchery strays on wild production.

Preliminary estimates of the proportion of hatchery-origin spawners in the wild streams.

| | Hatchery Proportion | | |
|---|---|---|---|
| PWS | 2013 | 2014 | 2015 |
| Pink Salmon | 4% | 15% | 10% |
| Chum Salmon | 3% | 3% | 3% |

| Southeast | 2013 | 2014 | 2015 |
|---|---|---|---|
| Chum Salmon | 7% | 5% | 9% |

To address whether or not fitness of wild stocks is being impacted, samples have been collected from 6 pink salmon pedigree streams in Prince William Sound and 4 chum salmon streams in Southeast for studies of potential relative difference in survival of offspring between hatchery and wild fish spawning in wild stock streams. This information will allow assessment of the ecological and genetic consequences of hatchery strays on fitness of wild spawners at the drainage scale. Evaluation of this scale is important because it will provide insight into how much these consequences can vary locally (and, potentially, why). The analysis has not been initiated as data continues to be collected yet pending more funding and selection of the SNPs (single nucleotide polymorphisms) that are used to determine parentage. The SNPs are now developed and the state's Gene Conservation Lab has submitted requests for two grants to conduct initial work on PWS pink salmon fitness studies.

A more detailed synopsis of the current findings can be found at:
http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/alaska_hatchery_research_project_synopsis_may_2017.pdf

Alaska State Regulation, the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222 (a) (1); (a) (5) (A, B),) codifies the precautionary approach in State regulation of salmon fisheries and habitats. This policy states that in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively as follows; a precautionary approach, involving the application of prudent foresight that takes into account the uncertainties in salmon fisheries and habitat management, the biological, social, cultural, and economic risks, and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality; a precautionary approach requires consideration of the needs of future generations and avoidance of potentially irreversible changes; prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly; initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species; that where the impact of resource use is uncertain, but likely presents a measurable risk to

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sustained yield, priority should be given to conserving the productive capacity of the resource; appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production; a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

Alaska has demonstrated its commitment to obtaining scientific information when faced with uncertainty regarding causes for decreased production or impacts of human activity. See clause 7.1 for examples of the state initiating extensive research programs in response to such uncertainty.

7.2. For new and exploratory fisheries, procedures shall be in place for promptly applying precautionary management measures, including catch or effort limits.

Alaska State Regulation, the Policy for the Management of Sustainable Salmon Fisheries specifies "The principles and criteria for sustainable salmon fisheries shall be applied... using the best available information... ADFG will... provide the BoF with reports on the status of salmon stocks and salmon fisheries under consideration for regulatory changes, which should include... identification of any ... management actions needed... such as the ... identification of a new fishery or expanding fishery" (5 AAC 39.222 (d)(1)(D)(I)) and that the reports will be the basis for "developing a management plan...[that] will ... (A) contain goals and measurable and implementable objectives that are reviewed on a regular basis and utilize the best available scientific information; (B) minimize the adverse effects on salmon habitat caused by fishing; (C) protect, restore, and promote the long-term health and sustainability of the salmon fishery and habitat; (D) prevent overfishing; and (E) provide conservation and management measures that are necessary and appropriate to promote maximum or optimum sustained yield of the fishery resource...[and]...if any new fisheries or expanding fisheries, or yield concerns, stock management concerns, or stock conservations concerns exist.. The BoF will... amend or develop salmon fishery management plans" ((5 AAC 39.222 (d) (2) and (3). Also, 5AAC 39.210, the Management Plan for High Impact Emerging Fisheries requires that high impact emerging fisheries be closed until an interim management plan and associated regulations are developed.

The fundamental objective of Alaska salmon fishery management is that escapement goals must be achieved. When stock status justifies allowing a fishery, ADFG local biologists specify a time and area for the fishery to occur. The contingency plan to respond to an adverse environmental change or depressed stock status determination is simply to not open the fishery.

The state wide Sustainable Salmon Policy (5AAC 39.222) mandates that escapement goals must be established for all exploited salmon stocks. This policy also requires ADFG to provide the Board of Fish on a regular basis, a stock status report, a review of escapement goals, and action plans that include management directives to promote recovery of any stocks of concern.

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## 7.4. Section D. Management Measures

### 7.4.1. Fundamental Clause 8

**Management shall adopt and implement effective management measures designed to maintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable utilization of the fishery and be based upon verifiable evidence and advice from available scientific and objective, traditional sources.**

| | |
|---|---|
| **Number of Supporting clauses** | **17** |
| **Supporting clauses applicable** | **15** |
| **Supporting clauses not applicable** | **2** |
| **Overall level of conformity** | **Full Conformity** |
| **Non Conformances** | **0** |

**Summarized evidence:**

8.1. Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.

The Alaska State Constitution Section 4 states "Sustained Yield. Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses. The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.22), directs management measures to ensure sustainability of yield. The Policy is implemented through the various fishery management plans for different fisheries in different regions and areas of the state.

The BoF has the power to develop management plans and allocate fishery resources among personal use, sport, guided sport, and commercial fisheries under state law (AS 16.05.251). Management plans are developed in an open public process that permits all citizens the opportunity to propose alternative schemes. When developing such management plans and deciding how the conservation burden will be shared, the Board uses the following criteria:

1. The history of each personal use, sport, and commercial fishery;
2. The characteristics and number of participants in the fisheries;
3. The importance of each fishery for providing residents the opportunity to obtain fish for personal and family consumption;
4. The availability of alternative fisheries resources;
5. The importance of each fishery to the economy of the state;
6. The importance of each fishery to the economy of the region and local area in which the fishery is located;

The importance of each fishery in providing recreational opportunities for residents and non-residents. Legislation was passed in 1973 to establish a "limited entry" system to allow the state to limit the number of
Participants in a specific fishery. State statute AS 16.43.140 states, "After January 1, 1974, a person may not operate gear in the commercial taking of fishery resources without a valid entry permit or a valid interim-use permit issued by the commission.
The Commission established an "Optimum Number" of permits for each salmon fishery through its research on

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the economics of the individual and management needs of that fishery. Various reports prepared by the Commission can be found at:
https://www.cfec.state.ak.us/Publications/salmon.htm
Since implementation of limited entry, other actions have been taken to improve economic viability of the fishing fleet, for example, in 2008, the Southeast Revitalization Association conducted a permit buy-back program in the Southeast Alaska salmon purse seine fishery which resulted in the purchase and subsequent relinquishing of 35 limited entry permits to CFEC.

8.2. States shall prohibit dynamiting, poisoning and other comparable destructive fishing practices.

Under Alaska regulations (5AC39.150), the use of an explosive, chemical or poison in the taking of fish or shellfish is prohibited, except for the use of chemical baits or lures to attract shellfish.

8.3. States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery.

Four general classes of salmon users have been identified; commercial, subsistence recreational, and personal use. Both state (AS 16.05.258 (b)) and federal (ANILCA Title VIII) laws prioritize subsistence uses over all other consumptive uses of fish and game. State law (16.05.251(e)) requires that "allocation decisions deal with identifying parties with a legitimate interest in the use and management of the fishery. Allocation of the harvest among users is the responsibility of a citizen panel comprised of a membership representative of all users—the BoF. The BoFard receives formal proposals and advice from 82 Advisory Committees that representative all classes of resource users in local communities. Fishery management plans, based on scientific research and fishery data conducted by ADFG, are not adopted by the BoF until it also considers effects on the various domestic parties with a legitimate interest in the use and management of the affected fisheries. This information is obtained from Advisory Councils, public testimony, and information provided by ADFG. Criteria used by the BoF when making decisions regarding how the conservation and utilization of resources will be shared is outlined in Clause 8.1.2.

8.4. Mechanisms shall be established where excess capacity exists, to reduce capacity. Fleet capacity operating in the fishery shall be measured. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.
See supporting clause 8.1

8.5. Technical measures shall be taken into account, where appropriate, in relation to: fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, protection of juveniles or spawners. Types of legal gear for Alaska fisheries are listed in regulation (5 AAC39.105). Specific requirement for gear (i.e. gillnet length, depth, and mesh sizes) are defined for each management area as well as in specific management plans and regulations. Within each management area, zones are established, typically near the mouths of streams that are permanently closed to fishing. Likewise, within each management area, times when fishing may be permitted. Size of fish that may be retained is generally not implemented for commercial fisheries. One notable exception is that a minimum size of 28 inches is established for the troll caught Chinook salmon in Southeast. Harvest of juveniles is not permitted. Waters near spawning grounds are closed to fishing. In addition, state law (AS 16.10.010) prohibits Interference with salmon spawning streams and water regulation activities in and or around streams in either fresh or salt water. The regulations for Southeast are good example of the scope of these types of regulations see:

http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2015_2018_se_yakutat_salmo

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n_regulations.pdf
8.6. Fishing gear shall be marked.

By statute, (AS16.05.510 and AS 16.05.520)) salmon fishing vessels are required to be licensed by the State of Alaska, and to display their permanent vessel license plate. The fishing gear itself must be marked in accordance with state regulations (5AAC 06.334). Also, there are region-specific regulations which require how salmon fishing gear must display their names and permit numbers. All Alaska salmon fishing, except for a very small troll fishery in Southeast Alaska, is conducted in state waters ("internal waters"). This means it is very unlikely that any fishing gear deployed by Alaskan salmon fishers will be encountered by vessels of other nations.

8.7. Measures shall be introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts shall be made to ensure that resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities are restored.
The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) outlines the process for identifying a depleted resource and the process to facilitate recovery. It also identifies actions to address habitat issues critical to the fishery resources. In part, the policy sates the following:

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

(A) A stock-by-stock assessment of the extent to which the management of salmon stocks and fisheries is consistent with the principles and criteria contained in the policy under this section;
(B) Descriptions of habitat status and any habitat concerns;
(C) Identification of healthy salmon stocks and sustainable salmon fisheries;
(D) Identification of any existing salmon escapement goals, or management actions needed to achieve these goals, that may have allocative consequences such as the:

(i) Identification of a new fishery or expanding fishery;
(ii) Identification of any salmon stocks, or populations within stocks, that present a concern related to yield, management, or conservation; and
(iii) Description of management and research options to address salmon stock or habitat concerns.

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

(A) Contain goals and measurable and implementable objectives that are reviewed on a regular basis and utilize the best available scientific information;
(B) Minimize the adverse effects on salmon habitat caused by fishing;
(C) Protect, restore, and promote the long-term health and sustainability of the salmon fishery and habitat; (D) prevent overfishing; and
(E) Provide conservation and management measures that are necessary and appropriate to promote maximum or optimum sustained yield of the fishery resource.

(3) In the course of review of the salmon stock status reports and management plans described in (1) and (2) of

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

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

(A) Measures required to restore and protect salmon habitat, including necessary coordination with other agencies and organizations;
(B) Identification of salmon stock or population rebuilding goals and objectives;
(C) Fishery management actions needed to achieve rebuilding goals and objectives, in proportion to each fishery's use of, and hazards posed to, a salmon stock;
(D) Descriptions of new or expanding salmon fisheries, management concern, yield concern, or conservation concern; and
(E) Performance measures appropriate for monitoring and gauging the effectiveness of the action plan that are derived from the principles and criteria contained in this policy.

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

8.8/8.9/8.10/8.11/8.12/8.13. States shall encourage the development and implementation of technologies and operational methods that reduce waste and discards and reduce the loss of fishing gear. The implications of the introduction of new fishing gears, methods and operations shall be assessed and the effects of such introductions monitored. New developments shall be made available to all fishers and shall be disseminated and applied appropriately.

The traditional gear used in the Alaska salmon fishery includes purse seines, gill nets (drift and set) and hook and line troll. These gear types are generally environmentally benign except in the rare cases when a drift net is lost; it can entangle many types of fish and wildlife. Concern for the status of Chinook salmon in the Yukon River has led to the use of fish wheels to harvest Chum Salmon while permitting the release of Chinook. In addition, dip nets have become an alternative gear in the lower river to replace gillnets to save chinook. Finally, non-retention regulation for Chinook salmon in Kodiak purse seine fisheries has permitted harvest of comingled Sockeye and Pink Salmon.
The use of the above mentioned gear types coupled with specific time and area openings to target salmon stocks where surplus production exists has led to very low incidence of by-catch of non-target species.
In addition to the practical aspects of why by-catch is low, ADFG regulation (5 AAC 93.310.) requires operators of all salmon fishing gear to minimize incidental harvest of non-target species.

The potential for lost or abandoned fishing gear and subsequent effects of ghost fishing due to this lost gear would

seem to be very small for purse seines, troll gear, and fish wheels. Gill nets would appear to have the greatest potential for both loss and ghost fishing. Lost or abandoned salmon gill net gear has been addressed in the Bristol Bay salmon fishery, where a regulation (5 AAC 06.331(t) requires permit holders to report a lost a gillnet, or portion of a gillnet, to the local ADFG office within 15 hours of the loss.

Fishery regulations in Alaska are extremely detailed with regard to the configuration of acceptable gear for use in each fishery, as well as how to deal with impacts on fishery resources and other users due to gear selectivity and fishing. For example, see the Southeast regulations regarding gear specifications (http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2015_2018_se_yakutat_salmon_regulations.pdf ). It would be extremely difficult to circumvent this regulation, and even if such a situation occurred, the regulatory and management system would be able to effectively respond. In the two fisheries where selective fishing practices are in place, circumventing the definition of a legal purse seine or fish wheel gear appears to be nearly impossible.

ADFG has participated in research programs on an international basis on issues such as fishing gear selectivity and improvements to fishing methods and strategies.
The NPAFC is the primary international venue for promoting the conservation of anadromous stocks and ecologically-related species, including marine mammals, sea birds, and non-anadromous fish, in the high seas area of the North Pacific Ocean. The NPAFC encourages research programs such as fishing gear selectivity and fishing methods. It also serves as a venue for coordinating the collection, exchange, and analysis of scientific data regarding these species and coordinates high seas fishery enforcement activities by member countries

Overall there has been little need for new research undertaken on the selectivity of traditional salmon gear types with regard to non -target species because by-catch has been demonstrated to be very low. However, research into the selectivity by size and sex of gillnet gear of the target species has been undertaken on several occasions.

8.14. Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures.

Clause NA. For Information on developments in other fisheries: The placement of artificial structures in marine waters of Alaska is limited to pilot research projects in Prince William Sound near Whittier and in Lynn Canal near Juneau, and to the sinking of two old vessels for scuba diving recreational purposes, also near Juneau. These structures have had little to no impact on salmonid fishes in the area and are likewise unlikely to affect salmon fishing.

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### 7.4.2. Fundamental Clause 9

**Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards and guidelines and regulations.**

| | |
|---|---|
| **Number of Supporting clauses** | **3** |
| **Supporting clauses applicable** | **2** |
| **Supporting clauses not applicable** | **1** |
| **Overall level of conformity** | **Full Conformity** |
| **Non Conformances** | **0** |

**Summarized evidence:**

9.1./9.2./9.3. Education and training programs.

The Alaska Institute of Technology (formerly called Alaska Vocational Training & Education Center), is within the Department of Labor Workforce Development, operates the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Centre is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Centre is a USCG approved training facility located in Seward, Alaska, and offers USCG and international Standards of Training, Certification, & Watchkeeping -compliant maritime training.

The University of Alaska Sea Grant Marine Advisory Program provides education and training in several sectors, including fisheries management, in the form of seminars and workshops. In addition, the program conducts sessions of their Alaska Young Fishermen's Summit. Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation (e.g. MSFCMA), to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. ASMI provide educational information across a whole range of fishery and fish related matters, including quality, hygiene, food safety, sustainability, and environmental protection. ADFG publishes a variety of documents, booklets and pamphlets that provide information on Alaska salmon, including regulations, educational items, and news stories. Data on fishers is held in a number of agencies, including Alaska Fisheries Information Network and CFEC. Some of the information is confidential, while a substantial amount is published in summary form annually

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## 7.5. Section E. Implementation, Monitoring and Control

### 7.5.1. Fundamental Clause 10

**An effective legal and administrative framework shall be established and compliance ensured through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction.**

| | |
|---|---|
| **Number of Supporting clauses** | **6** |
| **Supporting clauses applicable** | 6 |
| **Supporting clauses not applicable** | 0 |
| **Overall level of conformity** | Full Conformance |
| **Non Conformances** | 0 |

**Summarized evidence:**

10.1. Effective mechanisms shall be established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programs, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified.

The salmon management program conducted by ADFG is a responsive and adaptive program that monitors salmon abundance during the fishing season and makes continual adjustments in fishing effort and area based on observed escapements, commercial fishery performance (e.g., catch per unit of effort), test fishing, demographics, historical run timing curves and other data. The structure of ADFG, with management authority instilled at the area office level, allows it to monitor, control and enforce compliance with fishery regulations and eEOs. Alaska Wildlife Troopers (AWT) are primarily responsible for enforcement of Alaska's fish and wildlife-related statutes and regulations.[33] ADFG Area Management Biologists are on the scene to actually watch the prosecution of the fishery in their area through aerial surveys and on-the-ground observations. They, as well as regional staff biologists, are deputized law enforcement officers trained to assist AWT with law enforcement activities[34]. ADFG has instituted an ongoing training and refresher classes to keep deputized staff up-to-date on enforcement techniques. Citizens can also report fish and wildlife violations in Alaska through AWT's Safeguard organization.[35]

Data From Alaska Wild Life Troopers (Commercial Fisheries Data; June to August 2017)

- 674 commercial salmon fishing vessel boarding's – this number would generally only include vessels boarded where no offenses were charged as a result of the boarding.
- 191 incidents which document offenses charged for commercial salmon fishing regulations which are specific to the 15 salmon fishing management areas. Those areas include: Artic-Kotzebue, Norton Sound-Port Clarence, Yukon, Bristol Bay, Kuskokwim, Alaska Peninsula, Atka-Amlia Islands, Aleutian Islands, Chignik, Kodiak, Cook Inlet, Prince William Sound, Yakutat, and Southeastern Alaska Areas. The majority of offenses are related to commercial fishing in closed waters and commercial fishing during a closed period. It also includes offenses related to illegal gear.

[33] http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main
[34] http://www.dps.state.ak.us/AWT/mission.aspx
[35] http://www.dps.alaska.gov/AWT/safeguard.aspx

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- 112 incidents documented offenses related to statewide statutes and regulations related to commercial salmon fishing. The majority of these offenses are related to licensing requirements, as well as gear marking requirements

10.2 Fishing vessels shall not be allowed to operate on the resource in question without specific authorization.
In 1973, Alaska's legislature established a "limited entry" system to control the number of participants in designated fisheries. State statute AS 16.43.140 states, "After January 1, 1974, a person may not operate gear in the commercial taking of fishery resources without a valid entry permit or a valid interim-use permit issued by the commission." Under the limited entry system, only legally permitted vessels can operate in commercial salmon fisheries[36]. The CFEC helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers. CFEC issues permits and vessel licenses to qualified individuals in both limited and unlimited fisheries, and provides due process hearings and appeals for those individuals denied permits. A permit holder database and portal for permit application is publicly accessible through CFEC's website.[37]

10.3 States involved in the fishery shall, in accordance with international law, within the framework of sub-regional or regional fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their national jurisdiction.
The NPAFC[38], composed of representatives from Canada, Japan, Korea, Russia, and the United States (including Alaska), serves as a forum for promoting the conservation of anadromous fishes and ecologically-related species, including marine mammals, sea birds, and non-anadromous fishes, in the high seas area of the North Pacific Ocean that are beyond national boundaries. The NPAFC coordinates salmon high seas fishery enforcement activities by member countries[39], because directed fishing for salmonids is prohibited in the area and agreements have been made to minimize the incidental take of salmonids in other area fisheries. The NPAFC's scientific research[40] focuses on trends in marine production of salmon, their population structure and diversity in marine ecosystems of the North Pacific, and on climate change impacts.
Alaska, along with other U.S. states, the U.S. federal government and Canada, also participates in the Pacific Salmon Treaty Process through its membership in the PSC[41], with focus to resolve difficult salmon management problems shared by neighbor states.

10.3.1 States which are members of or participants in sub-regional or regional fisheries management organizations or arrangements shall implement internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States shall also proceed, as necessary, to assist other States in achieving the objectives of the FAO CCRF (1995), and should make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State.
Under the auspices of the Food and Agriculture Organization of the United Nations (FAO), a concerted effort was

[36] http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main
[37] https://www.cfec.state.ak.us/
[38] http://www.npafc.org/new/index.html
[39] http://www.npafc.org/new/enforcement_activities.html
[40] http://www.npafc.org/new/science.html
[41] http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/

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made to develop a comprehensive "toolbox" of measures that States could use to confront the issues of illegal, unreported and unregulated (IUU) fishing. Ultimately, the FAO adopted the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA) in 2001.[42]
The objective of the IPOA is to prevent, deter and eliminate IUU fishing by promoting: (1) broad participation and coordination among States, as well as representatives from industry, fishing communities and non-governmental organizations; (2) the phasing in of action to implement the IPOA on the earliest possible timetable; (3) the use of a comprehensive and integrated approach, so as to address all impacts of IUU fishing; (4) the maintenance of consistency with the conservation and long-term sustainable use of fish stocks and the protection of the environment; (5) transparency; and (6) non-discrimination in form or in fact against any State or its fishing vessels. The IPOA calls upon all States to develop and adopt national plans of action to achieve the objectives of the IPOA and to give full effect to its provisions as an integral part of their fisheries management programs and budgets.
The U.S. National Plan of Action is organized along the same lines as the IPOA.
The United States is party to most significant international agreements in this field and was among the first to ratify the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea (10 December 1982) Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, which entered into force on December 11, 2001.[43]

10.4 Flag States shall ensure that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish.
The IPOA calls upon flag States to adopt measures to ensure that no vessel be allowed to fish unless authorized. Many provisions of the MSFCMA[44] and other fishery laws of the United States prohibit unauthorized fishing by both U.S. and foreign flag vessels in waters under the jurisdiction of the United States and provide a basis for imposing penalties for such illegal fishing. Moreover, the United States has implemented the FAO Compliance Agreement[45], which requires all U.S. vessels fishing on the high seas to possess a permit and conditioning such permits on observation of all internationally agreed conservation and management measures recognized by the United States. Permit holders are required to fish in accordance with the provisions of these agreements and U.S. regulations.

10.4.1 Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State shall be marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.
The High Seas Fishing Compliance Act (HSFCA; see citation in Supporting Clause 10.4, above) authorizes a system of permitting for U.S. fishing vessels that operate on the high seas to satisfy the obligation of Parties to the Compliance Agreement that requires fishing vessels flying their flags to obtain specific authorization to operate on the high seas. The HSFCA requires the Secretary of Commerce to establish conditions and restrictions on each permit issued under HSFCA as necessary and appropriate to carry out the obligations of the United States under the Compliance Agreement (see 16 U.S.C. 5503 (d)[46]). At a minimum, such conditions and restrictions must include the marking of the permitted vessel in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing Vessels[47], and reporting of fishing activities. Parties are also responsible for ensuring that

[42] http://www.nmfs.noaa.gov/ia/iuu/iuu_nationalplan.pdf
[43] http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm
[44] http://www.nmfs.noaa.gov/sfa/laws_policies/msa/
[45] http://www.nmfs.noaa.gov/ia/agreements/LMR%20report/agreement_to_promote_compliance_.pdf
[46] https://www.law.cornell.edu/uscode/text/16/5503
[47] ftp://ftp.fao.org/docrep/fao/008/t8240t/t8240t01.pdf

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their authorized vessels do not undermine conservation and management measures, including those adopted by international fisheries management organizations, or by treaties or other international agreements. The HSFCA prohibits the use of fishing vessels on the high seas in contravention of international conservation and management measures recognized by the United States.


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### 7.5.2. Fundamental Clause 11

**There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.**

| | |
|---|---|
| **Number of Supporting clauses** | **3** |
| **Supporting clauses applicable** | 3 |
| **Supporting clauses not applicable** | 0 |
| **Overall level of conformity** | Full Conformance |
| **Non Conformances** | 0 |

**Summarized evidence:**

11.1 National laws of adequate severity shall be in place that provide for effective sanctions.

Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16[48] (AS16) and Alaska Administrative Code Title 5[49] (AAC5). Laws and regulations that structure the fishery are enforced by AWT. AWT coordinates with, and is supported by, law enforcement personnel from the United States Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE). US Forest Service and USFWS enforcement also work with AWT on the enforcement of fish and game regulations (both state and federal) on federal public lands. In most cases, violation of fish and wildlife regulations is punishable through fines, imprisonment, loss of fishing rights, and/or confiscation of equipment (including fishing vessel).

11.2 Sanctions applicable in respect of violations and illegal activities shall be adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions shall also be in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.

The AWT is charged with protecting the state's natural resources through law enforcement aimed to eliminate or limit illegal harvest, waste and illegal sale of fish, and by safeguarding fish and wildlife habitats. ADFG's management structure, which lends authority to area offices, allows it to monitor, control and enforce compliance with fishery regulations and emergency orders. Area Management Biologists can directly observe the prosecution of the commercial salmon fishery in their area through aerial surveys and on-the-ground surveillance. Listed below are those state statutes that allow the government to fine, imprison, revoke fishing rights and confiscate fishing equipment as punishment for conviction of regulatory violations:

AS 16.05.165. Form and issuance of citations
AS 16.05.170 Power to execute warrant
AS 16.05.180 Power to search without warrant
AS 16.05.190 Seizure and disposition of equipment
AS 16.05.195 Forfeiture of equipment
AS 16.05.332 Wildlife Violator Compact
AS.16.05.410 Revocation of license
AS 16.05.710 Suspension of Commercial License and Entry Permit
AS 16.05.722 Strict liability commercial fishing penalties
AS 16.05.723 Misdemeanour commercial fishing penalties
AS 16.05.896 Penalty for causing material damage

[48] http://www.touchngo.com/lglcntr/akstats/Statutes/Title16.htm
[49] http://www.touchngo.com/lglcntr/akstats/aac/title05.htm

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AS 16.05.901 Penalty for violations of AS 16.05.871 – AS 16.05.896.
AS 16.05.030 Penalty for violation of 16.10.010-16.10.050
AS 16.10.090 Penalty for violation of AS 16.10.090
AS 16.10.220 Penalty for violation of AS 16.10-200-16.1-.210
AS 16.10.790 Fines
AS 16.40.290 Penalty
AS 16.34.850-895 Point system for commercial fishing violations in salmon fisheries
AS 16.43.960 Commission revocation or suspension of permits
AS 16.43.970 Penalties

11.3 Flag States shall take enforcement measures in respect of fishing vessels entitled to fly their flag which have been found by them to have contravened applicable conservation and management measures, including, where appropriate, making the contravention of such measures an offence under national legislation.

Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5). See references provided in Supporting Clause 11.1. These laws and regulations are enforced by the AWT. AWT coordinates with, and is supported by, law enforcement personnel from USCG and NMFS.

All Alaska salmon fishing vessels are required by law to be licensed by the State of Alaska, and to display their permanent vessel license plate. Fishing gear must also be marked in accordance with state regulations, which are region specific. Local regulations also require how salmon fishing vessels must display their names and permit numbers.

Relevant state statutes include:
AS 16.05.510. Unlicensed vessel unlawful
AS 16.05.520. Number plate
5 AAC 06.334. Identification of gear AAC 06.343. Vessel identification

ADFG and AWT regularly inspect the catch and landing records of both harvesters and processers, and monitor the fishing permits required of harvesters and their crew members. The presence of ADFG and AWT in all major and many minor communities of the state have opportunity to directly monitor fishing activities where they occur. ADFG and AWT inspect the catch and landing records of both harvesters and processers, and verify compliance with fishing permits required of harvesters and their crew members.

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## 7.6. Section F. Serious Impacts of the Fishery on the Ecosystem

### 7.6.1. Fundamental Clause 12

**Considerations of fishery interactions and effects on the ecosystem shall be based on best available science, local knowledge where it can be objectively verified and using a risk based management approach for determining most probable adverse impacts. Adverse impacts on the fishery on the ecosystem shall be appropriately assessed and effectively addressed.**

| | |
|---|---|
| **Number of Supporting clauses** | **16** |
| **Supporting clauses applicable** | 16 |
| **Supporting clauses not applicable** | 0 |
| **Overall level of conformity** | Full Conformance |
| **Non Conformances** | 0 |

**Summarized evidence:**

12.1. States shall assess the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and assess the relationship among the populations in the ecosystem.

Alaska's Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222)[50] explicitly recognizes and accounts for the influence of variable environmental conditions on Alaska's salmon stocks. This policy states that "salmon escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the salmon stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the salmon stock measured". The influences of environmental and ecological factors on salmon growth and survivorship are carefully considered by ADFG during development of annual escapement goals that are then used to manage commercial fisheries and direct recovery efforts for stocks of concern. ADFG publishes annual reports of harvest and run size forecasts for significant salmon stocks in harvest regions[51], which explicitly consider the effects of environmental variables on salmon survivorship and production.

Since 2004, researchers from NOAA Fisheries' Auke Bay Laboratory have produced pre-season forecasts of pink salmon, based on oceanographic and surface trawl data, the latter being a measure of marine abundance of juvenile pink salmon[52]. These forecasts are provided to ADFG to assist with forecasting for management of harvest and escapement. Generally, NOAA's pink salmon forecasting models have performed exceptionally well, providing estimates within 10% of actual harvest in 9 of 13 years. However, anomalous (warm) ocean conditions in recent years are thought to be responsible for major harvest over-estimates in 2015 and 2016[53] (i.e. harvest was significantly less than expected). Notably, NOAA's juvenile pink salmon abundance estimate in 2017 was the lowest observed in the 21 years of data collection. Accordingly, pink salmon harvest in 2018 is projected to be lower-than-average and will likely require careful in-season monitoring of harvest to safeguard target escapement.

12.2 Adverse environmental impacts on the resources from human activities shall be assessed and, where appropriate, corrected.

Alaska's Policy for Management of Sustainable Salmon Fisheries prioritizes the protection of freshwater and marine habitats by declaring that:

[50] http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2016-2017/jointcommittee/5aac39.pdf
[51] https://www.adfg.alaska.gov/FedAidPDFs/SP16-07.pdf
[52] https://www.afsc.noaa.gov/ABL/EMA/EMA_PSF.htm
[53] https://www.afsc.noaa.gov/ABL/EMA/pdf/ORSI-PSTF-handout-Juneau-2016FINAL.pdf

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- Salmon habitats should not be perturbed beyond natural boundaries of variation
- Scientific assessments of possible adverse ecological effects of proposed habitat alterations and the impacts of the alterations on salmon populations should be conducted before approval of a proposal
- Adverse environmental impacts on wild salmon stocks and the salmon's habitats should be assessed

This policy is codified by Alaska Statutes 16.05.841-871[54] and implemented through regulations enforced by ADF&W that protect the freshwater habitats of anadromous fishes. MARPOL and U.S. policies and law provide necessary protection to marine habitats used by Pacific salmon.

12.3 The most probable adverse impacts of the fishery on the ecosystem/environment shall be considered, taking into account available scientific information, and local knowledge. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.

The most probable impacts from the Alaskan commercial salmon fishery are posed through potential risks from hatchery-reared salmon to wild stocks and overfishing of the same. Information on harvest of wild stocks is obtained through hatchery marking programs[55] and reporting of harvest by mark type. Annual wild salmon escapement goals and estimates, which are set, monitored and reported by ADFG, allow managers to evaluate the impacts of harvest on wild stocks and adjust efforts accordingly[56]. Research designed to measure the extent and effect of hatchery-wild interactions for several Pacific salmon species is being conducted through partnerships between ADFG and non-governmental research centers[57] [58] [59], with financial support from Alaska, the Private Non=Profit hatchery operators and the Pacific Seafood Processors Association and U.S. government. Results from this ongoing research are reported annually[60] and considered by fisheries managers. As stated on ADFG's website, "As good stewards of wild salmon stocks and the natural resources of the state, ADF&G believes strongly this work should be undertaken. It recognizes that the results will likely have some ambiguity and may even be interpreted differently by some groups. Nonetheless, this information will likely guide future decisions and will greatly advance the understanding of the ecological and evolutionary dynamics of wild and hatchery interactions."[61]

12.4 Impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.

The potential ecological and genetic risks posed by hatchery salmon to wild populations is the subject of several ongoing research projects that are evaluating the stray and genetic introgression rates of hatchery pink and chum salmon, as described in Supporting Clauses 12.3 and 13.1. Potential impacts from hatchery programs and harvest on wild salmon abundance is routinely monitored through harvest reporting and state mandated spawner escapement surveys (see references in Supporting Clause 12.3).

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54 http://forestry.alaska.gov/Assets/uploads/DNRPublic/forestry/pdfs/statutes/2013_For_mgmt_stat_reg_TEXT_COVER_UPDATE.pdf

55 https://mtalab.adfg.alaska.gov/OTO/Default.aspx

56 http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmonforecast

57 http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.current_research

58 http://www.sitkascience.org/research/chum-project/

59 http://pwssc.org/hatchery-wild/

60 http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates

61 http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates#results

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12.5 Appropriate measures shall be applied to minimize:

- catch, waste and discards of non-target species (both fish and non-fish species)
- impacts on associated, dependent or endangered species

State and federal policies and regulations serve to minimize bycatch of non-target species in Alaskan commercial salmon fisheries, and utilize non-target, incidental catch in a sustainable manner. Alaska's Policy for the Management of Sustainable Salmon Fisheries states that "salmon escapement and harvest management decisions should be made in a manner that protects non-target salmon stocks or species" and ADF&G uses test fisheries and in-season catch information to direct harvest efforts, so as to protect stocks of concern. Management of gear type, season and location are strictly enforced by ADFG to target specific salmon stocks. Although some impacts from the Alaskan commercial salmon fishery on endangered species, including marine mammals, are expected to occur, incidents of serious injury or mortality are mandatorily reported and are subject to take limits established by the NMFS and USFWS in accordance with the U.S. Endangered Species Act[62].

12.5.1 There shall be management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

Several federal policies and associated laws establish management guidelines and legal protections for endangered species that might be affected by the Alaskan commercial salmon fishery. These policies include the MSFCMA, the Marine Mammal Protection Act (MMPA) and the U.S. Endangered Species Act (ESA). Under the MMPA, all Category I and II fisheries[63] must be registered in the Marine Mammal Avoidance Program and report any injuries or mortalities of marine mammals to NMFS within 48 hours. All MMPA category fisheries are liable for incidental take of any ESA-listed species. In additional to federal regulations, ADFG provides additional state-level protections for endangered species and stocks of concern[64].

12.6 Non target catches, including discards, of stocks other than the "stock under consideration" shall be monitored and shall not threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action shall be taken.

Incidental catch in Alaskan commercial salmon fisheries occurs at a negligible level and all catch, including incidental catch of non-target species, must be reported to ADFG and not exceed established harvest limits. Allowable harvest of bycatch in commercial salmon fisheries is regulated by limits, season, species, region and gear as described in annual fishery management plans[65] and ADFG regulations. Commercial catch of target and non-target species must be reported to ADF&G, which has developed and uses electronic "fish tickets" and "eLandings" reporting tools, in addition to traditional paper catch records[66].

12.7. The role of the "stock under consideration" in the food web shall be considered, and if it is a key prey species in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.

Pacific salmon in Alaska have been the subject of extensive study, and their role in marine, freshwater and

[62] http://www.nmfs.noaa.gov/pr/laws/mmpa/
[63] http://www.nmfs.noaa.gov/pr/interactions/mmap/
[64] http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.akendangered
[65] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesPlanning.annual
[66] http://www.adfg.alaska.gov/static-f/license/fishing/pdfs/reporting_requirements_2016.pdf

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terrestrial foodwebs is well understood[67] [68]. Although salmon are not typically considered a key prey species in marine environments, they may serve as keystone species in some riparian and terrestrial environments, where diverse predators and scavengers feed on adult spawners[69]. Escapement goals and management by ADFG serve to protect the ecosystem services provided by salmon in Alaska's freshwater and terrestrial environments.

12.8. States shall introduce and enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).
MARPOL 73/78, the "International Convention for the Prevention of Pollution from Ships", applies to and is enforced in Alaskan waters.

12.9. There shall be knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved shall be avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat shall be considered, not just that part of the spatial range that is potentially affected by fishing.
EFHs for Alaskan salmon include marine and freshwater environments designated and protected by the North Pacific Fishery Management Council, NMFS and ADFG[70]. Fishing and gear restrictions are in place to protect designated marine areas of EFH, as described in Fisheries Management Plan for the Salmon Fisheries in the EEZ off Alaska[71]. Alaska's Policy for the Management of Sustainable Salmon Fisheries provides guidelines for the protection of freshwater habitats used by salmon, and this policy is implemented through the regulatory capacity of ADFG, which restricts human activities and works in rivers and streams occupied by anadromous fishes in accordance with Alaska Statutes 16.05.841-871[72]. The Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes, maintained by ADFG, specifies which streams, rivers and lakes are important to anadromous fishes, including salmon[73].

12.10. Research shall be promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities.
Recent peer-reviewed research identified Alaskan commercial salmon fisheries as high-ranking with respect to the "triple bottom line" of community, ecological and economic sustainability[74]. Salmon produced by hatcheries are released into open waters and are subject to common property fisheries, allowing diverse user groups access to fisheries resources. Research on coexistence theory suggests that conflict among user groups of Alaskan salmon is likely alleviated by state fisheries regulations that promote equity[75].

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67 https://www.researchgate.net/profile/Richard_Brodeur/publication/33514958_A_synthesis_of_the_food_habits_and_feeding_ecology_of_salmonids_in_marine_waters_of_the_North_Pacific/links/0c96052b9c65b54848000000.pdf

68 https://www.researchgate.net/profile/Daniel_Schindler3/publication/226979254_Trophic_ecology_of_Pacific_salmon_Oncorhynchus_spp_in_the_ocean_A_synthesis_of_stable_isotope_research/links/00b49528da1396ad6d000000/Trophic-ecology-of-Pacific-salmon-Oncorhynchus-spp-in-the-ocean-A-synthesis-of-stable-isotope-research.pdf

69 http://www.sfu.ca/biology/faculty/palen/Wendy_Palen/Home_files/Schindler%20et%20al%202003-Frontiers.pdf

70 http://www.afsc.noaa.gov/HEPR/efh.htm

71 http://www.npfmc.org/wp-content/PDFdocuments/fmp/Salmon/SalmonFMPfinal1212.pdf

72 http://forestry.alaska.gov/Assets/uploads/DNRPublic/forestry/pdfs/statutes/2013_For_mgmt_stat_reg_TEXT_COVER_UPDATE.pdf

73 https://www.adfg.alaska.gov/sf/SARR/AWC/

74 http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0122809

75 https://link.springer.com/article/10.1007/s10745-016-9806-0

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12.11. There shall be outcome indicator(s) and management objectives for non-target stocks.

ADFG sets harvest limits on incidental catch of non-target species and stocks. These limits are communicated through publication of regulations and fisheries management plans.

According to the Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska, "Bycatch in the directed commercial salmon fisheries primarily consists of groundfish species and the incidental catch of immature salmon. State and federal management measures minimize bycatch to the extent practicable and minimize the mortality of bycatch. A combination of factors work together to keep both the number of fish taken as bycatch and the associated mortality of those fish at a negligible amount. First, ADFG fish tickets serve as a standardized reporting method documenting all retained harvest from both state and EEZ waters. ADFG regulations require that fish tickets record the type of gear used as well as the number, pounds, delivery condition, and disposition of fish species harvested and retained for both commercial and personal use (5 AAC 39.130(c)). Maximum retainable allowances (MRAs) of certain non-salmon allow for bycatch to be treated as incidental catch so that those species are able to be utilized. In addition, non-retention requirements when MRAs are achieved create incentives to avoid those species taken as bycatch. Specified closure areas during those times of the year when bycatch is generally highest serves to significantly reduce the amount of bycatch taken. Finally, the nature of the gear utilized in the troll fishery allows for discarded species to be released with limited mortality. Additional management measures are not necessary to document bycatch interactions within salmon fisheries."

12.12. There shall be outcome indicator(s) consistent with achieving management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

NMFS and the USFWS establish limits on "take" (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or attempt any of these) for all species listed as threatened or endangered under the ESA[76]. Exceedance of allowable take by participants in Alaskan commercial salmon fishery is subject to prosecution and severe penalties[77]. In addition to protections for federally listed species, ADFG maintains a state list of endangered species[78] and coordinates protection efforts for these species with Federal agencies.

12.13. There shall be outcome indicator(s) and management objectives for avoiding, minimizing or mitigating the impacts of the unit of certification on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

Alaska's Policy for the Management of Sustainable Salmon Fisheries states that, "salmon spawning, rearing and migratory habitats should be protected" and that "salmon habitats should not be perturbed beyond natural boundaries of variation" such that "wild salmon stocks and the salmon's habitats should be maintained at levels of resource productivity that assure sustained yields". This policy is legislatively supported by Alaska Statutes 16.05.841-871[79], which describe legal protections for essential freshwater salmon habitats. Alaska's Salmon Fisheries Management Plan[80] identifies essential marine habitats for salmon and provides clear management guidelines and outcome indicators for the protection of these.

12.14. There shall be outcome indicator(s) and management objectives for dependent predators.

[76] http://www.nmfs.noaa.gov/pr/laws/esa/text.htm

[77] http://www.nmfs.noaa.gov/pr/laws/esa/text.htm#section11

[78] http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.akendangered

[79] http://forestry.alaska.gov/Assets/uploads/DNRPublic/forestry/pdfs/statutes/2013_For_mgmt_stat_reg_TEXT_COVER_UPDATE.pdf

[80] http://www.npfmc.org/wp-content/PDFdocuments/fmp/Salmon/SalmonFMPfinal1212.pdf

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Adult escapement goals[81] and estimates[82] serve as performance indicators of management aimed to protect the productivity of wild salmon and safeguard their role as keystone species in riparian environments.

12.15. There shall be outcome indicator(s) and management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.

In accordance with the State's constitution, Alaskan salmon fisheries are managed on the principle of sustained yield[83]. Management is required to maintain adult escapement at levels adequate to ensure the viability of wild populations, and escapement serves as the primary outcome indicator for salmon management in Alaska. Salmon escapement is monitored and estimated both in-season and on an annual basis[84]. By law, commercial fisheries and associated hatcheries cannot, therefore, undermine the structure, processes and function of salmon in the marine and aquatic

### 7.6.2. Fundamental Clause 13

**Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.**

| | |
|---|---|
| **Number of Supporting clauses** | **19** |
| **Supporting clauses applicable** | 19 |
| **Supporting clauses not applicable** | 0 |
| **Overall level of conformity** | Medium Conformance |
| **Non Conformances** | 1 |

**Summarized evidence:**

13.1. States shall promote responsible development and management of aquaculture, including an advanced evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information.

Alaskan commercial salmon fisheries harvest wild- and hatchery-produced salmon, the latter being produced by private non-profit hatcheries that are permitted and regulated by ADFG. In accordance with Alaska's Policy for the Management of Sustainable Salmon Fisheries and the State's Finfish Genetics Policy[85], hatcheries are typically sited away from major natural production areas, yet use locally-sourced fish to found and, in some cases, supplement hatchery broodstocks.[86] State, Federal and privately sponsored research has and continues to focus on potential ecological and genetic effects from Alaskan salmon hatcheries, including investigations of competition, stray rates, and genetic introgression[87]. Particularly noteworthy among these are two large-scale research projects being conducted by ADFG in partnership with the PWSSC[88] and the Sitka Sound Science Center[89], which are designed to evaluate genetic and ecological impacts from stray hatchery pink and chum salmon in Alaska. This work began in March, 2012, receives funding from hatchery operators, was recently awarded

[81] http://www.adfg.alaska.gov/FedAidPDFs/FMS15-04.pdf
[82] http://www.adfg.alaska.gov/sf/FishCounts/
[83] http://www.adfg.alaska.gov/index.cfm?adfg=process.commissioner
[84] http://www.adfg.alaska.gov/FedAidPDFs/FMS15-04.pdf
[85] http://www.adfg.alaska.gov/static-f/fishing/PDFs/research/genetics_finfish_policy.pdf
[86] http://www.fishsciences.net/reports/2012/Enviro_Bio_Fishes_94_273-283.pdf
[87] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.main
[88] http://pwssc.org/hatchery-wild/
[89] http://www.sitkascience.org/research/chum-project/

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significant (Federal) Saltonstall-Kennedy[90] and North Pacific Research Board funding[91], is expected to continue through 2023, and has generated numerous publications[92] [93]. Most recent findings are available through ADFG's website[94], which document the percentage of hatchery origin chum salmon on spawning grounds to range from 5% to 9% in SEAK, and 3% in PWS for run years 2013-2015. Hatchery pink salmon comprised 4%-15% of naturally spawning populations in PWS study streams during the same time period. Preliminary results suggest that naturally spawning salmon populations in PWS and SEAK continue to be productive in the presence of hatchery straying, which tends to be localized around hatchery operations and away from areas of major natural production (Brenner et al. 2012)[95].

13.1.1 In the case of enhanced fisheries, the fishery management system should take due regard of the natural production processes and be appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimising adverse impacts on ecosystem structure and function.

Alaska's Constitution, Policy for the Management of Sustainable Salmon Fisheries and Finfish Genetics Policy all serve as guiding documents for the sustainable management of Alaska's commercial salmon fisheries and associated hatchery programs. To achieve sustainability, adult escapement is the first priority of salmon management in Alaska and is routinely monitored through aerial surveys, weirs, in-river sonar and tower-based counts. Alaska's state constitution explicitly states (Section 4, Article 8) that "salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of size, range, sex ratio, and other population attributes". Accordingly, hatchery broodstocks are established with native stocks and cited away from areas of major natural production, so as to minimize genetic and ecological impacts to wild fish[96]. Hatchery management in Alaska is based upon and supported by scientific research, like that described in the previous subclause, which considers the health, structure and function of natural populations and ecosystems.

13.2 State shall produce and regularly update aquaculture development strategies and plans, as required, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities.

ADFG maintains authority to issue permits for the construction, operation and modification of salmon hatcheries in Alaska. This agency reviews the potential ecological, fisheries and other impacts of proposed hatcheries before issuing a permit and has authority to revoke or deny permission for alterations to a permit. An outline of the permitting process and criteria is available through the ADFG website[97]. Finally, hatcheries must submit annual reports of their activities to ADFG. These reports are also available through the agency's website[98].

13.2.1 State shall ensure that the livelihoods of local communities, and their access to fishing grounds, are not negatively affected by aquaculture developments.

Alaska's Constitution and Policy for the Management of Sustainable Salmon Fisheries provide clear protections for common property salmon fisheries in Alaska, thereby safeguarding the livelihoods of local communities that use salmon as a resource. Public hearings are held at least 30 days before the issuance of a salmon hatchery

[90] http://www.nmfs.noaa.gov/mb/financial_services/fy16_sk_grants_successful_applicants.htm
[91] http://www.nprb.org/
[92] https://link.springer.com/article/10.1007/s10641-012-9975-7
[93] http://www.adfg.alaska.gov/static-f/fishing/PDFs/hatcheries/research/pwssc_hw_2015_report_withappendices.pdf
[94] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates
[95] https://link.springer.com/article/10.1007/s10641-012-9975-7
[96] http://www.adfg.alaska.gov/static-f/fishing/PDFs/research/genetics_finfish_policy.pdf
[97] http://www.adfg.alaska.gov/index.cfm?adfg=hatcheries.hatchery
[98] http://www.adfg.alaska.gov/index.cfm?adfg=fishinghatcheriesotherinfo.reports

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permit, in accordance with Alaska Statute 16.10.410[99]. State and federal fishery management plans provide additional protections for common use of and maximum social benefit from Alaskan salmon fisheries. For example, the fourth objective of the Fishery Management Plan for Salmon Fisheries in the EEZ off Alaska[100] is to "maximize economic and social benefits to the nation over time".

13.3 Effective procedures specific to aquaculture of fisheries enhancement shall be established to undertake appropriate environmental assessment and monitoring, with the aim of minimizing adverse ecological changes (such as those caused by inputs from enhancement activities) and related economic and social consequences.
ADFG has the authority to issue permits for the construction, operation and modification of salmon hatcheries in the State of Alaska. See references in previous Supporting Clause. Before issuing a permit, the state reviews the potential ecological, fisheries and other impacts that a proposed hatchery might have, and the State reserves authority to revoke or deny permission for alterations to salmon hatchery permits. State statute AS 16.10.420[101] defines the conditions of approval for a salmon hatchery permit, which specifically consider the source, health and treatment of the cultured stock in accordance with Alaska's Finfish Genetics Policy, which also provides additional guidelines for the establishment, maintenance and transport of hatchery salmon in Alaska.

13.4. With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs shall consider the separate contributions from aquaculture and natural production.
In most cases, hatchery salmon in Alaska are mass marked via artificial water temperature oscillations during egg incubation or early embryo stages, inducing otolith thermal bands. This procedure and subsequent sampling of harvested adult salmon allows state managers to evaluate the separate contributions of hatchery and wild salmon to the commercial fishery's catch. A noteworthy exception to this standard practice has been the unmarked hatchery production of pink salmon by the Kodiak Regional Aquaculture Association at its Kitoi Bay and Pillar Creek facilities. Our Assessment Team noted that the large numbers of chum and pink salmon produced by the Kitoi Bay facility could not be distinguished from naturally produced salmon, either in fisheries or on spawning grounds. As a result, a minor non-conformance was issued in the 2016 US Alaska Commercial Salmon Reassessment Report[102], requiring that a Corrective Action Plan be developed. The Kodiak Regional Aquaculture Association (KRAA) and Alaska Fisheries Development Foundation developed a plan and associated schedule, with guidance from ADFG, which was appended to the 2016 reassessment report. Conformance to this plan is subject to annual review, as documented here. According to their plan, KRAA will conduct cost analyses and work to secure funding in years 2017-2021. During their 23 September 2016 meeting, the KRAA Board of Directors authorized staff to investigate costs and funding sources for marking salmon at their facilities and encouraging progress has recently been made toward experimental marking of Kodiak hatchery pink salmon. During a meeting with our Assessment Team on 12 December 2017, KRAA Executive Director, Ms. Tina Fairbanks, reported that 10% of the 2017 Kitoi Bay Hatchery pink salmon production had been otolith micro marked via a novel saltwater exposure technique. Photographs of the otolith marks from several specimens were provided and marks were clearly visible. This progress favourably demonstrates KRAA's interest and ability to comply with the tasks and schedule of their Corrective Action Plan. Conformance with this plan will continue to be monitored through annual evaluations.

[99] http://codes.findlaw.com/ak/title-16-fish-and-game/ak-st-sect-16-10-410.html
[100] http://www.npfmc.org/wp-content/PDFdocuments/fmp/Salmon/SalmonFMPfinal1212.pdf
[101] http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter10/Section420.htm
[102] http://www.alaskaseafood.org/wp-content/uploads/2017/03/ALASKA-RFM-SALMON-REASSESSMENT-Final-Report-March-2017.pdf

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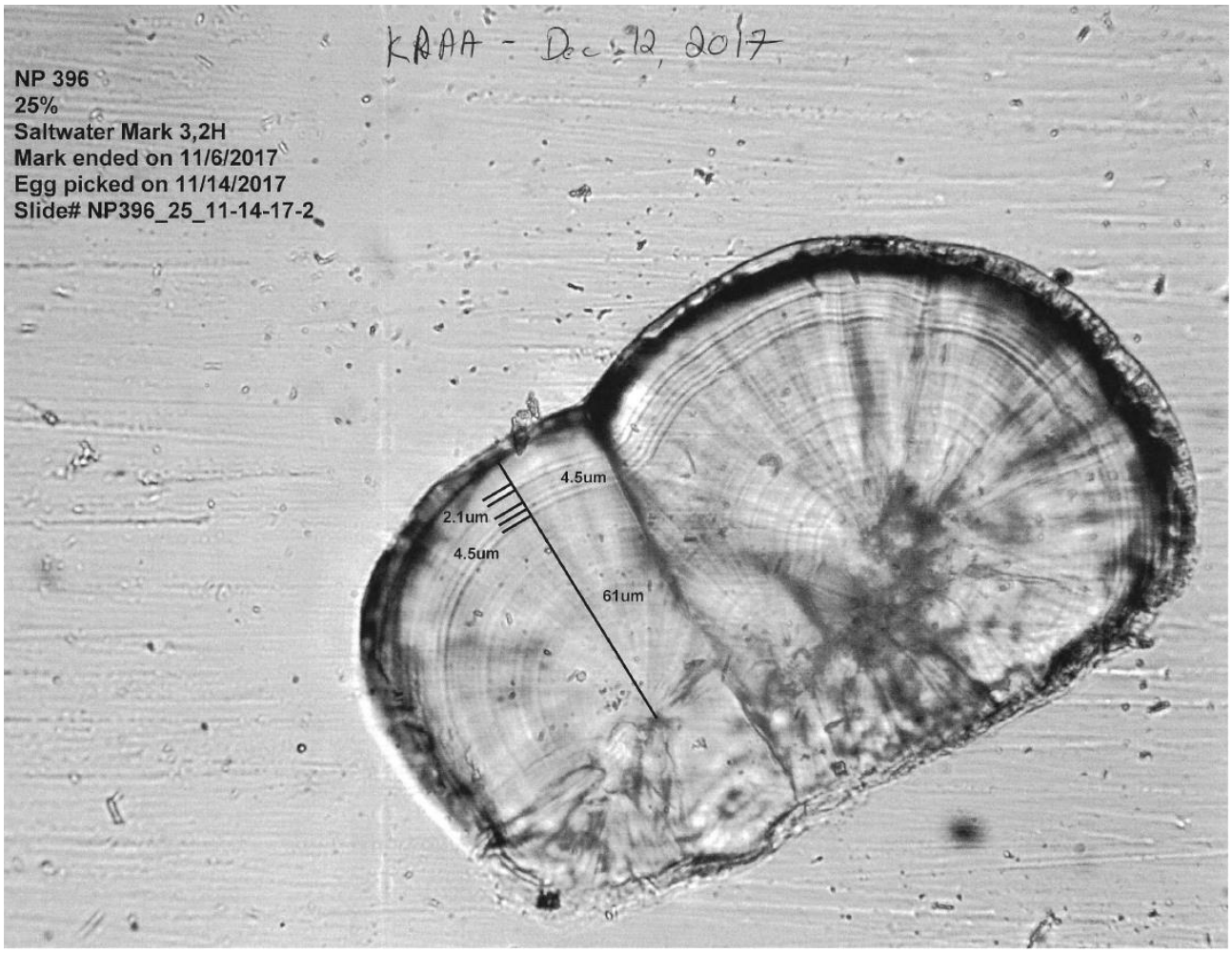


Figure 27. Image of a pink salmon otolith marked via saltwater exposure shock at Kitoi Bay hatchery on 6 November 2017. Image courtesy of T. Fairbanks, KRAA.

13.5. Habitat modifications for the purposes of enhancement do not cause serious or irreversible harm to the natural ecosystem's structure and function.

In accordance State statutes[103], ADFG considers habitat alterations and their potential impacts during its hatchery permit approval and review processes, which are described on the agency's website[104].

13.5.1 Efforts shall be undertaken to minimize the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture including culture based fisheries into waters.

As established by Alaska's Finfish Genetics Policy the use of non-native and genetically altered stocks for salmon fishery enhancement purposes is prohibited in Alaska.

13.5.2 Steps shall be taken to minimize adverse genetic disease and other effects of escaped farmed fish on wild stocks.

Impacts from hatchery salmon on wild stock are minimized or avoided through the implementation of state

[103] http://www.adfg.alaska.gov/static-f/fishing/PDFs/hatcheries/hatchery_statutes.pdf
[104] http://www.adfg.alaska.gov/index.cfm?adfg=hatcheries.hatchery

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statutes that prohibit "fish farming" (AS 16.40.210)[105] and control the source, health and release locations of hatchery-produced salmon. Alaska statute 16.10.420[106] explicitly directs that:

(1) Salmon eggs procured by the hatchery must be from the department or a source approved by the department;
(2) Salmon eggs or resulting fry may not be placed in waters of the state other than those specifically designated in the permit;
(3) Salmon eggs or resulting fry, sold to a permit holder by the state or by another party approved by the department, may not be resold or otherwise transferred to another person;
(4) Salmon may not be released by the hatchery before department approval, and, for purposes of pathological examination and approval, the department shall be notified of the proposed release of salmon at least 15 days before the date of their proposed release by the hatchery;
(5) Diseased salmon be destroyed in a specific manner and place designated by the department

13.5.3 Research shall be promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks, taking into account the critical need to conserve genetic diversity of endangered species.
Alaska's Finfish Genetics Policy recommends research with focus to assist rehabilitation and enhancement of salmon stocks. Notwithstanding these recommendations, no salmon stocks in Alaska are currently listed as endangered or threatened under the U.S. Endangered Species Act[107].

13.6 State shall protect transboundary aquatic ecosystems by supporting responsible aquaculture practices within their national jurisdiction and by cooperation in the promotion of sustainable aquaculture practices.
The Pacific Salmon Treaty[78] has been in effect since 1985 and provides clear policy direction for the responsible management of salmon fisheries and related fishery enhancement activities along Transboundaries Rivers of Alaska and Canada[108].

13.7 State shall, with due respect to their neighbouring States and in accordance with international law, ensure responsible choice of species, siting and management of aquaculture activities which could affect trans boundary aquatic ecosystems.
The Pacific Salmon Treaty has been in effect since 1985 and provides clear policy direction for the responsible management of salmon fisheries and related fishery enhancement activities along Transboundaries Rivers of Alaska and Canada. See (previous) Supporting Clause 13.6.

13.8 State shall consult with their neighbouring States, as appropriate, before introducing non-indigenous species into trans-boundary aquatic ecosystems.
See Supporting Clause 13.5.1; Alaska's Finfish Genetics Policy prohibits the introduction of non-indigenous species into trans-boundary aquatic ecosystems.

13.9. State shall establish appropriate mechanisms, such as databases and information networks to collect, share and disseminate data related to their aquaculture activities to facilitate cooperation on planning for aquaculture development at the national, sub-regional, regional and global level.
Alaska has developed or contributes to a number of databases designed to assist with the management of Pacific salmon fisheries management, including hatchery operations. These include a variety of genetic databases[109], the

[105] http://codes.lp.findlaw.com/akstatutes/16/16.40./03./16.40.210
[106] http://codes.findlaw.com/ak/title-16-fish-and-game/ak-st-sect-16-10-420.html
[107] https://www.fws.gov/endangered/species/us-species.html
[108] http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/
[109] http://www.adfg.alaska.gov/index.cfm?adfg=fishinggeneconservationlab.main

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regional coded-wire tag database (RMIS)[110], and an otolith mark database[111].

13.10. State shall cooperate in the elaboration, adoption and implementation of international codes of practice and procedures for introductions and transfers of aquatic organisms.
Alaska's Finfish Genetics Policy includes guidelines for the transport and release of salmon that restrict the importation and inter-regional translocation of stocks. These guidelines are detailed in the 2016 US Alaska Commercial Salmon Reassessment Report[112], and are based on widely-accepted theories of local adaptation in Pacific salmon.

13.11. States shall, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, encourage adoption and promote the use of appropriate practices/procedures in the selection and genetic improvement of broodstocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae, fry, broodstock or other live materials. States shall facilitate the preparation and implementation of appropriate national codes of practice and procedures to this effect.
Alaska's Finfish Genetics Policy provides restrictive guidelines for the transfer of salmon stocks into and within the State of Alaska. This policy justifies its guidelines through the importance of local adaptation for translocation success, and the need to protect wild stocks from hatchery transplants. See the 2016 US Alaska Commercial Salmon Reassessment Report, referenced in the previous Supporting Clause, for additional details.

13.12. Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes should be managed and developed according to the above provisions, especially in relation to maintaining the integrity of the environment, the conservation of genetic diversity, disease control, and quality of stocking material.
Alaska's Finfish Genetics Policy and Meyers' (2014) "Policies and Guidelines for Alaska Fish and Shellfish Health and Disease Control"[113] mandate the conservation of diversity, disease control and protection of the environment, as related to salmon fisheries enhancement activities in Alaska. Also see Supporting Clause 13.11.

13.13. Where applicable, enhanced fisheries shall meet the following criteria:

- The species shall be native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem;
- There shall be natural reproductive components of the "stock under consideration";
- The growth during the post-release phase shall be based upon food supply from the natural environment and the production system shall operate without supplemental feeding.

In Alaska, salmon produced by hatcheries for harvest in the commercial fishery are typically native to the region, supplement naturally produced components of the stock and grow in open ocean environments without supplemental feeding. All of these conditions are in accordance with state statutes, policies and regulations. Of state statutes that govern salmon production by hatcheries, AS 16.10.445 states, "Where feasible, salmon eggs utilized by a hatchery operator shall first be taken from stocks native to the area in which the hatchery is located, and then, upon department approval, from other areas, as necessary"[114]. Alaska's Finfish Genetics Policy provides

[110] http://www.rmpc.org/
[111] https://mtalab.adfg.alaska.gov/default.aspx
[112] http://www.alaskaseafood.org/wp-content/uploads/2017/03/ALASKA-RFM-SALMON-REASSESSMENT-Final-Report-March-2017.pdf

[113] http://www.adfg.alaska.gov/FedAidPDFs/RIR.5J.2014.04.pdf
[114] https://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/hatchery_statutes.pdf

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additional guidance for the selection of hatchery broodstock, stating that "Live salmonids, including gametes, will, not be imported from sources outside the state" and that "Stocks will not be transported between major geographic areas". Accordingly, non-native species are not produced by Alaskan salmon hatcheries.

13.14. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration":

- Naturally reproductive components of enhanced stocks shall not be overfished;
- Naturally reproductive components of enhanced stocks shall not be substantially displaced by stocked components. In particular, displacement shall not result in a reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest.

Alaska's Policy for the Management of Sustainable Salmon Fisheries clearly prohibits overfishing of naturally reproductive components of Alaskan salmon stocks. This policy is implemented through state and federal harvest regulations. Mass marking of hatchery fish and focused research efforts have investigated stray rates, competition effects and genetic introgression from hatchery salmon in Alaska. These results have provided evidence that some hatchery salmon stray onto wild spawning grounds[115] and in some cases may interbreed[116] [117]. Nevertheless, escapement estimates produced by ADFG strongly suggest that wild salmon populations in the state are, on the whole, stable and productive[118].

[115] https://link.springer.com/article/10.1007/s10641-012-9975-7
[116] http://www.adfg.alaska.gov/static-f/fishing/PDFs/hatcheries/research/alaska_hatchery_research_project_synopsis_may_2017.pdf
[117] http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates
[118] http://www.adfg.alaska.gov/FedAidPDFs/FMS15-04.pdf

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# 8. Performance specific to agreed corrective action plans

One minor non-conformances is active for this fishery.

A medium confidence rating and consequent minor nonconformance has been issued under:

**Fundamental clause 13:**
*Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.*
**Sub-clause 13.4:**
*With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs shall consider the separate contributions from aquaculture and natural production*.
**Details of Non-Conformance:**
No evidence available to demonstrate that evaluation of straying pink salmon has been conducted in Kodiak region since the 1980's. At this time (August 2016) a plan for implementation of marking of Kodiak hatchery
Pink salmon has not been finalized.
Furthermore, there is no formal commitment by ADFG to initiate marking of pink salmon. The Assessment team considers that marking of the enhanced component of pink salmon will support the assessment approach employed considering the separate contributions from aquaculture and natural production.

A corrective action plan from the client shall detail;

1. how AFDF intends to address this issue, and
2. a set of specific timelines to allow for assessment during the next surveillance activities in 2017, 2018 and 2019 and the second full assessment audit in 2020, as relevant and if needed.

This is the second surveillance assessment following the re-assessment in March 2017. Some progress is made according to the Client Action Plan; however it is not yet sufficient to be considered fulfillment of the NC.

These NC will remain open throughout the period of certificate (5 years) until the medium confidences move to high as the corrective actions take effect.

# 9. Unclosed, new non-conformances and new corrective action plans

No new non-conformances (NC) were identified during this 2$^{ndt}$ surveillance assessment of the fishery and progress was identified on the unclosed NC aligned to the accepted Client Action Plan (CAP).
An unclosed non-conformance (NC) was identified from the re-assessment and certification in March 2017. The minor NC is detailed below:

**Fundamental clause 13:**
*Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.*
**Subclause 13.4:**
*With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs shall consider the separate contributions from aquaculture and natural production*.
**Details of Non-Conformance:**

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No evidence available to demonstrate that evaluation of straying pink salmon has been conducted in Kodiak Region since the 1980's. At this time (August 2016) a plan for implementation of marking of Kodiak hatchery Pink salmon has not been finalized.
Furthermore, there is no formal commitment by ADFG to initiate marking of pink salmon. The Assessment team considers that marking of the enhanced component of pink salmon will support the assessment approach employed considering the separate contributions from aquaculture and natural production.

A corrective action plan from the client shall detail;

1. how AFDF intends to address this issue, and
2. a set of specific timelines to allow for assessment during the next surveillance activities in 2017, 2018 and 2019 and the second full assessment audit in 2020, as relevant and if needed.

## 10. Future Surveillance Actions

Next assessment will be a surveillance assessment before or on the anniversary of the re-certification in 2018.

## 11. Client signed acceptance of the action plan

The signed Client Action Plan, aligned to the previously mention NC was accepted by the assessment Team on 8th December 2016 (Complete details are outline in the full assessment report:
http://www.alaskaseafood.org/wp-content/uploads/2017/03/ALASKA-RFM-SALMON-REASSESSMENT-Final-Report-March-2017.pdf

## 12. Recommendation and Determination

**Following this 2nd Surveillance Assessment, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fisheries, The United States Alaska commercial salmon [all Pacific salmon species: Chinook *Oncorhynchus tschawytscha*, sockeye *O. nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*] fisheries, employ troll, purse seine, drift gillnet, beach seine, set gillnet and fish wheel (Upper Yukon River only) gear in the four administrative Regions of Alaska that are principally managed by the Alaska Department of Fish and Game (ADFG). While certification covers the entire Alaska Exclusive Economic Zone (EEZ), most of the harvest is taken in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.**

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# 14. Appendices

## 14.1. Appendix 1 – Assessment Team Details

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., is pleased to confirm the Full Assessment team members for the fishery as follows.

**Dr. Ivan Mateo, Lead Assessor**

Dr. Ivan Mateo has over 20 years' experience working with natural resources population dynamic modelling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bioenergetics modelling for Atlantic cod He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modelling of Alaska sablefish.

**Scott Marshall (Assessor)**

B.S. Fisheries Science Oregon State University, M.S. Fisheries Science University of Washington 1974 - 1980 Fisheries Scientist and Project Leader at the Fisheries Research Institute, University of Washington. Mr. Marshall's primary emphasis was on researching sockeye salmon productivity in the Chignik Lakes, Alaska, on determining the origins of Chinook salmon harvested by foreign vessels operating in the North Pacific Ocean, and on the population dynamics of sockeye salmon in the Lake Washington watershed of Washington.
1980 - 2001. Alaska Dept. Fish and Game: Mr. Marshall served in three primary capacities, Research Project Leader, Principal Fishery Scientist for Pacific Salmon Commission Affairs and Regional Supervisor. As a Project Leader Mr. Marshall lead research teams in the study of population structure and dynamics of the state's Pacific Salmon and Pacific herring stocks. As a Principal Scientist Mr. Marshall served as a Co-Chairman or as Alaska's senior representative on several international technical teams established by the Pacific Salmon Treaty (e.g. Chinook Salmon, Transboundary Rivers, Canadian/Alaska Boundary Area Fisheries, Interceptions Accounting Committee, Data Sharing Committee, Editorial board). Mr. Marshall served on Scientific and Statistical Committee of the North Pacific Management Council. As the Division of Commercial Fisheries Regional Supervisor for Southeast Alaska, Mr. Marshall represented the Department at Alaska Board of Fisheries meetings, reviewed and/or critiqued numerous regulatory proposals for the fisheries of Southeast Alaska. He oversaw the daily research and management of the Southeast Region's commercial, personal use and subsistence fisheries. He also served as Co-Chairman of the Transboundary Rivers Panel of the Pacific Salmon Commission. Undertook numerous administrative responsibilities, such as budgeting, hiring HR etc.
2000- 2005. Idaho Department of Fish and Game Mr. Marshall served as the Fisheries Bureau's Staff Biologist for Endangered Species Act Affairs. This included developing Biological Assessments, Applications for ESA Section 7 & 10 permits, and writing reports for incidental take of endangered Pacific salmon that occurred during the conduct of research activities, recreational fisheries and hatchery operations. I also served as the Department's representative on the Habitat Committee of the Pacific Fishery Management Council.
2005 - 2013 U.S Fish and Wildlife. Mr. Marshall was a Fisheries Administrator in charge of the Lower Snake River

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Compensation Plan (a hatchery mitigation program to compensate for construction and operation of four hydroelectric dams on the Lower Snake River in Washington Oregon and Idaho). He developed, presented and negotiated budgets for the program to the Bonneville Power Administration (roughly $30 million annually). He reviewed and negotiated annual budgets, contracts, annual spending and scientific reports developed by our fish and wildlife agency co-operators who implemented the program (3 states, 3 tribal agencies and several U.S Fish and Wildlife Service field offices). Mr. Marshall developed a series of three Programmatic Reviews (one for each of the primary species raised in our hatcheries) as required by the Northwest Power Planning Council's implementation legislation.

**Marc Johnson PhD (Assessor)**

Dr. Marc Johnson earned his doctoral degree from Oregon State University in 2009, where he studied and described the genetic structure of Oregon coastal coho salmon among hatchery and wild populations. He also holds a MSc degree in Ecology from the University of Brasilia (Brazil) and a BSc in Zoology, also from Oregon State University. Dr. Johnson has over 15 years of experience evaluating genetic and ecological interactions between hatchery and wild salmon populations and has authored publications on this and other fisheries-related topics in diverse, peer-reviewed journals. Currently, Dr. Johnson serves through a courtesy appointment as Assistant Professor for Oregon State University, and conducts research for the Oregon Department of Fish and Wildlife with particular emphasis on salmon reintroduction efforts, hatchery-wild interactions, induced triploidy effects, and the physiological bases for homing and straying behavior.

**Brian Allee, Ph.D. (Assessor)**

Dr. Brian Allee attended the University of California Berkeley majoring in zoology. He received his Ph.D. from the University of Washington in fisheries. Dr. Allee has worked extensively with salmonid fish specializing in salmon research, restoration and enhancement of salmon and steelhead in freshwater, estuarine, and marine ecosystems in Alaska, Washington and Oregon.

After working in Washington and Oregon as a fisheries biologist, he first came to Alaska in 1982 and worked for Prince William Sound Aquaculture Association as operations manager and later as president. He subsequently served as Director of the Fisheries Rehabilitation and Enhancement, Development Division (FRED) of the Alaska Department of Fish and Game. His responsibilities included the statewide public hatchery program, the private non-profit permitting and planning program, and oversaw the genetic, pathology, limnology, and coded wire tagging laboratories, fisheries engineering and regional and area FRED staff. While serving as Director he was appointed by the Governor to the Alaska Science and Engineering Commission and the Alaska Science and Technology Foundation.

Dr. Allee returned to Alaska in 2003 to be the Alaska Sea Grant Director at the University of Alaska Fairbanks where he was active in funding fisheries research, education and extension for coastal Alaska. He more recently worked for the National Marine Fisheries Service in Portland on Mitchel Act hatchery funding in the Columbia River and participated on hatchery reform efforts.

In addition, he was past President of the Fish Culture Section of the American Fisheries Society and a member of the Scientific and Statistical Committee of the Pacific Fisheries Management Council. During Dr. Allee's 44 year career as a fisheries scientist and administrator he had broad management experience at the policy and technical level, supervising large and small organizations in public (state, federal and tribal), private and private non-profit sectors.

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