FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION
FULL ASSESSMENT AND CERTIFICATION REPORT

For The

US Alaska Commercial Salmon Fisheries

Applicant Group

US Alaska Commercial Salmon Fisheries

Facilitated By:

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Contents

I. Summary and Determination

The Alaska Seafood Marketing Institute (ASMI), on behalf of the Alaska commercial salmon fisheries, has requested assessment of the US Alaska commercial salmon fisheries to the requirements of the FAO-Based Responsible Fisheries Management (RFM) Certification Program. The application was made in April 2010. After Validation Assessment was completed in August 2010, a full Assessment Team was formed to undertake the assessment and final certification determination was given on the 11th of March 2011.

The Alaska Responsible Fisheries Management (RFM) FAO-Based Standard is the United Nations Food and Agricultural Organisation's Code of Conduct for Responsible Fisheries (1995) (FAO Code).

The US Alaska commercial salmon fisheries, employing troll, purse seine, drift gillnet, set gillnet (and fish wheel in Upper Yukon River only) gear, in the four administrative Regions of Alaska, is principally managed by the Alaska Department of Fish and Game (ADFG). Almost all of Alaska's commercial salmon fisheries take place in the internal waters (0-3 nautical miles, and other enclosed waters) of the state of Alaska.

The Alaska RFM Standard accounts for no more and no less than the FAO Code and is the normative document.

The FAO Code was presented to an ISO 65/EN45011 accredited Certification Body, Global Trust Certification, to be used as the Standard for the assessment of Alaska Fisheries.

The conformance reference points from this published FAO Code (now referred to as Standard) were converted into the audit checklist criteria [FAO-Based RFM Criteria (Version 1, July 2010)] by the ISO 65/EN45011 Certification Body to ensure audit ability and feasibility for accreditation. The audit checklist criteria were cross-referenced back to the FAO Clauses. A further FAO document, the Guidelines on Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries (FAO 2005) was used to help contextualize and add clarity to the audit criteria.

The FAO Code and the Audit Checklist Criteria were submitted to a National Accreditation Board of the International Accreditation Forum for further cross reference and ISO 65/EN45011 accreditation validity.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification using the FAO-Based RFM Criteria (Version 1, July 2010). This Full Assessment Report should be read in conjunction with the Certification Summary attached in Appendix 5 of this document.

Whilst the FAO Code contains sections with differing focuses, only the sections and clauses relevant to Responsible Fisheries Management are the clauses which are detailed in this report.

During the assessment process the key outcomes evaluated and documented by the Assessment Team included:

A. The Fisheries Management System

Alaska's salmon fisheries are managed under a clear structure of laws, regulations, treaties, and other legal mandates and instruments, at the international, national (State), and local (state) levels. This management process is well-established and transparent. The Magnuson-Stevens Fishery Conservation and Management Act is the primary domestic legislation governing the management of American fisheries. For the state of Alaska, Article VIII, Section 4 (Sustained Yield) of Alaska's Constitution prescribes that replenishable resource such as fish belonging to the state shall be utilized, developed, and maintained on the sustained yield principle. Alaska Department of Fish and Game (ADFG) Commercial Fisheries Division is responsible for conservation of Alaska's salmon stocks and for management of the commercial fisheries. ADFG's main priority is achieving escapement, which ensures that enough salmon escape the fisheries, and spawn in their natal rivers. Management plans are established by ADFG and implemented by the Alaska Board of Fisheries (BoF) for each Region, incorporated into regulation in Title 5 Alaska Administrative Code, and available for timely implementation by the responsible ADFG area biologists.

B. Science and Stock Assessment Activities

ADFG operates an efficient data collection and analysis system that is effective in managing Alaska's salmon resources. ADFG is responsible for acquiring fishery dependant and independent information necessary to effectively manage commercial and also sport, subsistence, and personal use fisheries. Each year, ADFG staff located throughout the state define the data needs for management of each salmon fishery, develop statistically valid study designs, and collect, analyze, and report the data necessary for effective fisheries management plans. Each step of this process is guided by state policies, statutes, and/or nationally recognized scientific standards. ADFG maintains a large staff of research and management biologists (totaling over 350), located throughout the state, who are responsible for supervising the field data collection, laboratory work, data analysis, and reporting. The state also has numerous cooperative technical, stock assessment, and management interactions with other States and management organizations that deal with trans-boundary salmon stocks that are harvested in Alaska.

C. The Precautionary Approach

There was strong evidence of a precautionary approach used by management and specifically, for defining and identifying the reference points for salmon fisheries. There is provision of detailed regulations and availability of stock status management reports. The primary reference points used for salmon management are escapement goals. All of Alaska's salmon fisheries have been divided into individual runs, or aggregates of runs, for management purposes. For each individual run, or stock aggregates, an escapement goal has been established. In-season management tools, principally the Emergency Order, gives local ADFG staff the authority to effectively close fisheries in

real time to allow a high likelihood that escapement goals are met for the protection of spawning escapement. State Regulation, the Policy for the Management of Sustainable Salmon Fisheries, codifies the precautionary approach for regulation of salmon fisheries and for habitat conservation. The statewide Sustainable Salmon Policy (SSP) requires the ADFG to routinely provide regional stock status reports, escapement goal reviews, and action plans that include management directives to promote recovery of any stocks of concern.

D. Management Measures

The Alaska Commercial Fisheries Entry Commission (CFEC) limits the number of participating fishers to provide economic stability in Alaska fisheries. Permits and vessel licenses for each gear type are issued to qualified individuals and there is a transparent process for appealing decisions made by CFEC.

Biologically established Escapement Goals (BEGs) form the principal control rule for setting harvest limits. BEGs are usually established using stock-recruit information which generally requires multiple years of run reconstructions to establish. A Sustainable Escapement Goal (SEGs) is the level of past escapement that has resulted in sustainable yield over a 5-10 year period. SEGs are used when data are insufficient to establish a BEG, usually due to lack of stock specific harvest data. Two other, less common escapement goals are also defined in the SSP. An Optimum Escapement Goal (OEG) is a specific management objective for salmon escapement that considers biological and allocative factors and may differ from BEGs or SEGs. A Sustainable Escapement Threshold (SET) is a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. Every three years each Alaskan administrative region updates its escapement information and submits a salmon stock status report to the BoF.

The BoF considers these status reports and makes allocative decisions based on proposals and recommendations from all interests; including from fishing, other stakeholders, the state and the BoF itself. The process separates the conservation role of ADFG from the allocation role of BoF.

Time and area restrictions limit when and where specific fisheries occur, and restrictions are also imposed by regulation on all types of fishing gear. As discussed, Emergency Orders are used to close or limit access to fisheries based on information on run strength and escapement goals.

E. Implementation, Monitoring and Control

The salmon management program conducted by ADFG is a responsive and adaptive program. It monitors salmon abundance during the fishing season and makes continual adjustments in fishing time and area based on observed escapements, commercial fishery performance, test fishing, biological data on age, sex and size, historical run timing curves and other data. Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5) enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation. Withdrawal or suspension of authorizations to officers of a fishing vessel is also among the enforcement options.

The Alaska Wildlife Troopers (AWT) Division is charged with protecting the state's natural resources. The U.S. Coast Guard (USCG) also enforces boating safety laws and fishing vessels. For fisheries under federal management, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Office for Law Enforcement (OLE) enforces federal laws that protect and conserve Alaska's living marine resources and their habitat. Cooperation and coordination among ADFG, AWT, USCG, and OLE is frequent and routine. As noted, the Alaska Limited Entry system only allows legally permitted vessels to operate in salmon fisheries.

F. Serious Impacts of the Fishery on the Ecosystem

Alaska's SSP includes provisions addressing the potential effects of ecological changes/perturbations on sustainably allowable salmon harvest and maintenance of normal ecosystem functioning. Potential ecological effects on salmon stocks are incorporated in the establishment of escapement goals for each stock. Fishing gear employed for harvest of Alaska salmon is not considered to have habitat disturbance impact on the fisheries and ecosystems. Ocean ranching and salmon fishery enhancement is practiced widely for the purpose of ensuring Common Property Fishery harvest. These activities, i.e., salmon hatcheries and the harvest of the salmon they produce, are strictly regulated by the state through ADFG so as to avoid or minimize effects on genetic diversity of wild salmon and ecosystem integrity caused by stray hatchery returns and density dependent factors. Whilst there is evidence of hatchery straying, research is and has been underway by ADFG, the North Pacific Anadromous Fish Commission (NPAFC), and NOAA focuses on the quantification, ecological interaction of hatchery released and wild salmon in Alaska, marine ecology of juvenile salmon and density dependent growth factors in the high seas. NOAA's time-series and process-oriented studies have revealed no compelling evidence of ecological interaction of hatchery and wild salmon in the coastal marine habitat.

Outcome summaries of the Full Assessment and Certification Report can be found in Section 6.

Recommendation of the Assessment Team

The Assessment Team recommends that the management system of the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the state management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

Peer Reviewers summaries and recommendations

The final salmon Assessment Report was reviewed by two external Peer Reviewers. Their reports can be found in Section 8 of this report.

Peer Reviewer A's main summary and recommendation states:

The information presented in sections 1, 2 and 3 of the report provide a wealth of background information to support a broad understanding of the general history, development and main management entities and management systems in use by the salmon fisheries in Alaska. In the main part of the report, the evidence based rationales and summaries, presented for each clause of the Conformance Criteria, are entirely consistent with the proposed outcome (confidence rating) and recommendation made by the Assessment Team.

Peer Reviewer B's main summary and recommendation states:

The US Alaska Salmon Fishery evaluation for the FAO-Based Responsible Fishery Management Certification was very encompassing of all aspects of the fishery in all regions of the state. The six major components were addressed using the 14 fundamental clauses and supporting sub-clauses. I found the supporting information accurate and concur with the high ratings given to the supporting sub-clauses. I did find some omissions of information that although not critical would have furthered the justification of some of the clauses. The background information provided enough detail to understand the fishery. There were some minor factual errors in this reviewer's opinion in that background that should be corrected, to provide a clear and unbiased discussion of the nature of the fishery. However, these errors were not of such a critical nature that the reader would not understand how the fishery developed and is prosecuted at this time.
Overall, I concur with the Assessment Team recommendation that the management system of the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the State management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program .

Note
All Peer Review comments were addressed by the Assessment Team. The Peer Review reports can be found in Section 8 along with the Assessment Team responses to comments made and additional information if suggested.

Determination: The appointed members of the Global Trust Certification Committee met on the 11th of March 2011. After detailed discussion, the Committee determined that the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the state management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

II. Schedule of Key Assessment Activities

Assessment Activities	Date (s)
Application Date	April 2010
Initial Site Visit Consultation Meetings	June –July 2nd 2010
Initial Validation Assessment Report	August 2010
Appointment of Full Assessment Team	September- October 2010
On-site Witnessed Assessment and Consultation Meetings	Nov 15th-19th and Dec 2nd-8th 2010
Draft Assessment Report	February 10th 2011
External Peer Review	February 12th 2011
Final Assessment Report	March 1st 2011
Certification Review/Decision	March 11th 2011

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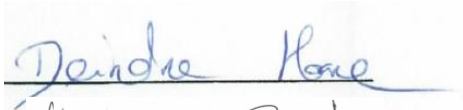
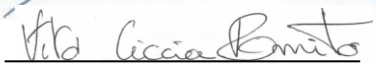
Signature: 

Signature: 

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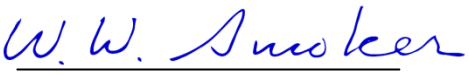
Signature: 

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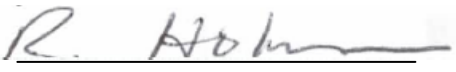
Signature: 

Validation Report Prepared by:
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IV. Acronyms and Definitions

ACMP	Alaska Coastal Management Plan
ADFG	Alaska Department of Fish and Game
AMR	Annual Management Reports
ASMI	Alaska Seafood Marketing Institute
AWT	Alaska Wildlife Troopers
AYK	Arctic-Yukon-Kuskokwim
BoF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CCRF	Code of Conduct for Responsible Fisheries
CFEC	Commercial Fisheries Entry Commission
CPF	Common Property Fisheries
CPUE	Catch per Unit Effort
DIPAC	Douglas Island Pink and Chum, Inc.
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
FMP	Federal Management Plan
GOA	Gulf of Alaska
IFQ	Individual Fishing Quota
IVQ	Individual Vessel Quota
LCI	Lower Cook Inlet
MSFCMA	Magnuson-Stevens Fisheries Management and Conservation Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPAFC	North Pacific Anadromous Fish Commission
NPFMC	North Pacific Fishery Management Council
NSRAA	Northern Southeast Regional Aquaculture Association
OLE	Office for Law Enforcement
PNP	Private Non-Profit
PSC	Pacific Salmon Commission
PWS	Prince William Sound
PWSAC	Prince William Sound Aquaculture Corporation
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation
SSRAA	Southern Southeast Regional Aquaculture Association
TAC	Total Allowable Catch
UCI	Upper Cook Inlet

Definitions:

Biological Escapement Goal (BEG). BEG is the primary management objective for escapement unless an optimal escapement or in-river run goal has been adopted. It is developed from the best available biological information. A BEG is the escapement that provides the greatest potential for maximum sustained yield and takes into account stock-recruit data, and fishing power.

Sustainable Escapement Goal (SEG). SEG is a level of escapement, indicated by an index or an escapement estimate that is known to provide for sustained yield over a 5 to 10 year period. It is developed from the best available scientific information. The SEG is determined by ADFG, and is stated as a range that takes into account data uncertainty.

Optimal Escapement Goal (OEG). An OEG is the optimum escapement goal that allows for sustainable runs based on biological needs of the stock and ensures healthy returns for commercial, sport, subsistence, cost-recovery, and personal use harvests. The SEG is the primary management objective for the escapement, unless an Optimal Escapement Goal (OEG) or in-river run goal has been adopted.

Sustained Escapement Threshold (SET). SET is the threshold level of escapement, below which the ability of a salmon stock to sustain itself is jeopardized. The SET is a stock-specific limit reference point set lower than the lower bound of the BEG and SEG.

1. Introduction

The US Alaska commercial salmon fisheries, employing troll, purse seine, drift gillnet, set gillnet (and fish wheels in the Upper Yukon River) gear in administrative Region 1 (Southeast & Yakutat), Region 2 (Central), Region 3 (Arctic-Yukon-Kuskokwim) and Region 4 (Kodiak, Chignik, Alaska Peninsula, Aleutian Islands) principally managed by the Alaska Department of Fish and Game (ADFG), taking place in the internal waters (0-3 nm, and other enclosed waters) of the state of Alaska, has been assessed against the requirements of the FAO-Based RFM Certification Program. All 5 species of Pacific Salmon formed part of the assessment proposal.

- King or Chinook *(Oncorhynchus tschawytscha)*
- Sockeye or red *(Oncorhynchus nerka)*
- Coho or silver *(Oncorhynchus kisutch)*
- Pink or humpback *(Oncorhynchus gorbuscha)*
- Keta or chum *(Oncorhynchus keta)*

The application was made by the Alaska Seafood Marketing Institute (ASMI) on behalf of the Alaska commercial salmon fisheries and participants, and was validated by Global Trust Certification Ltd.

This Assessment Report o documents the assessment procedure for the Certification of commercially exploited Alaska salmon to the FAO-Based RFM Certification Program. This is a voluntary program for Alaska fisheries and has been supported by ASMI who wish to provide an independent, third-party certification program that can be used to verify that Alaska fisheries are responsibly managed according to the FAO Code of Conduct for Responsible Fisheries.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification in accordance with EN45011/ISO/IEC Guide 65 accredited certification procedures. The assessment is based on the criteria specified in the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries (1995) and the minimum criteria set out for marine fisheries in the FAO Guidelines for the Eco-Labeling of Fish and Fishery Products from Marine Capture Fisheries (2005/2009), hereafter generally referred to as the FAO Criteria.

The assessment is based on 6 major components of responsible management that are derived from the FAO Code of Conduct for Responsible Fisheries and Guidelines for the Eco-labeling of products from marine capture fisheries.

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 14 fundamental clauses which in turn are sustained by 96 sub-clauses. Collectively, these form the FAO Conformance Criteria against which a fishery applying for RFM certification is assessed.

The assessment comprised of; application review, validation reporting, assessment planning, assessment and certification reporting, Peer Review and Certification Committee review. Two site visits were made to the fishery during the assessment. At various stages in the assessment process, information pertaining to the step in the assessment process has been posted on the Alaska Seafood website at the following address http://sustainability.alaskaseafood.org/salmon-certification. A summary of the consultation meetings is presented in section 5. Assessors comprised of both external contracted fishery consultants and Global Trust internal staff (Appendix 1). Peer Reviewers comprised of external contracted fisheries consultants (Appendix 2).

This report documents each step in the assessment process and the recommendation to the Certification Committee of Global Trust who will preside over the certification decision according to the requirements of ISO/IEC Guide 65 accredited certification.

2. Fishery Applicant Details

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3. Background to the Fishery

3.1 Species Biology

The life histories of all Pacific salmon have been studied and reported on extensively. For the purpose of this Assessment Report, the authors have quoted text from the ADFG Wildlife Notebook series. The full text can be found on the internet at sites listed under each species. A fundamental biological trait of Pacific salmon, with respect to how they are managed, is their anadromous life-histories, spawning and hatching in freshwater and migrating at various stages in development (species dependent) to the sea before returning to their natal stream to spawn. The following table provides a summary of the specific biology and life-cycle traits of each of the 5 species of salmon that are included in the assessment.

Table 1. Salmon species life-cycle and habitat.

Species	Life Cycle	Habitat/ Feeding	Primary Gear Types by Region
King/Chinook	It is the largest of all Pacific salmon, with weights of individual fish exceeding 30 pounds. There is usually a single run from May to July. Each female deposits from 3,000 to 14,000 eggs in several redds, which she excavates in relatively deep, moving water. The eggs usually hatch in late winter or early spring, depending on time of spawning and water temperature. The newly hatched fish, called alevins, live in the gravel for several weeks until they wiggle up through the gravel by early spring. Most juvenile Chinook salmon remain in fresh water until the following spring when they migrate to the ocean in their second year of life. They are sexually mature from 2nd to 7th year.	Chinook is abundant from the southeastern panhandle to the Yukon River. Major populations return to the Yukon, Kuskokwim, Nushagak, Susitna, Kenai, Copper, Alsek, Taku, and Stikine rivers. Redds are in relatively deep, moving water. Juvenile Chinook in fresh water feed on plankton, and then later eat insects. In the ocean, they eat a variety of organisms including herring, pilchard, sandlance, squid, and crustaceans. Chinook salmon grow rapidly in the ocean and often double their weight during a single summer season.	R1: Troll R2:Drift gillnet R3:Gillnet, fish wheel R4:Purse Seine
Keta/chum	Chum salmon spawning is typical of Pacific salmon with the eggs deposited in redds located primarily in upwelling spring areas of streams. Female chum may lay as many as 4,000 eggs, but fecundity	Chum salmon are the most abundant commercially harvested salmon species in Arctic, northwestern, and interior Alaska, but are of relatively less importance in other areas of Alaska.	R1: Seine, gillnet R2:Seine, drift gillnet

	typically ranges between 2,400 and 3,100 eggs. After spawning in the fall, the salmon fry emerge in spring and move out to sea by fall. Most mature by 4 years age. There are a higher percentage of chums in the northern areas of the state. Chum varies in size from 4 to over 30 pounds, but usually range from 7 to 18 pounds, with females generally smaller than males.	Chum salmon often spawn in small side channels and other areas of large rivers where upwelling springs provide excellent conditions for egg survival. Chum do not have a period of freshwater residence after emergence of the fry, as do Chinook, coho, and sockeye salmon. Chum fry feed on small insects in the stream and estuary before forming into schools in salt water where their diet usually consists of zooplankton.	R3:Gillnet, fish wheel R4:Purse seine, gillnet
Coho/silver	Coho enter spawning streams from July to November. The female digs a nest, called a redd, and deposits 2,400 to 4,500 eggs. The eggs develop during the winter, hatch in early spring, and the embryos remain in the gravel utilizing their egg yolk until they emerge in May or June. They spend one to three winters in streams and may spend up to five winters in lakes before migrating to the sea as smolts. Adults usually weigh 8 to 12 pounds and are 24 to 30 inches long, but individuals weighing over 30 pounds have been landed.	Coho are found in coastal waters of Alaska from Southeast to Point Hope on the Chukchi Sea and in the Yukon River to the Alaska-Yukon border. Coho salmon enter spawning streams from July to November, usually during periods of high runoff. The emergent fry occupy shallow stream margins, and, as they grow, establish territories which they defend from other salmonids. They live in ponds, lakes, and pools within streams and rivers, usually among submerged, woody debris- in quiet areas free of current- from which they dart out to seize drifting insects.	R 1: Troll, gillnet, purse seine R2:Drift gillnet R3:Gillnet R4:Purse seine, gillnet
Pink/humpback	Pink salmon enter spawning streams between late June and mid-October and hatch mid-winter. Late winter or spring the fry swim up out of the gravel and migrate downstream into salt water. They mature in 2 years which means that odd-year and even-year pops are essentially unrelated. The pink salmon is the smallest of the Pacific salmon found in North America with an average weight of about 3.5 to 4 pounds and average length of 20-25 inches.	Pink salmon are native to Pacific and arctic coastal waters from northern California to the Mackenzie River, Canada, and to the west from the Lena River in Siberia to Korea. Most spawn within a few miles of the coast and spawning in the intertidal zone or the mouth of streams is very common. Shallow riffles where flowing water breaks over coarse gravel or cobble-size rock and the downstream ends of pools are favored spawning areas. Following entry into salt water, the juvenile pink salmon move along the beaches in dense schools near the surface, feeding on plankton, larval fishes, and occasional insects.	R1: Purse seine R2:Purse seine, gillnet R3:Gillnet R4:Purse seine, gillnet

Sockeye/red	Eggs hatch during the winter, and the young sac-fry, or alevins, remain in the gravel, living off the material stored in their yolk sacs, until early spring. After hatching, juvenile sockeye salmon may spend up to four years in fresh water before migrating to sea. In systems with lakes, juveniles usually spend one to three years in fresh water before migrating to the ocean in the spring as smolts. However, in systems without lakes, many juveniles migrate to the ocean soon after emerging from the gravel and spend 1 – 4 years in the ocean before returning to spawn during summer months. Returning adults usually weigh between 4 and 8 pounds, although weights in excess of 15 pounds have been reported.	This species ranges south as far as the Klamath River in California and northern Hokkaido in Japan, to as far north as far as Bathurst Inlet in the Canadian Arctic and the Anadyr River in Siberia. Freshwater systems with lakes produce the greatest number. Spawning usually occurs in rivers, streams, and upwelling areas along lake beaches. At this time they emerge from the gravel as fry and move into rearing areas. In systems with lakes, juveniles usually spend one to three years in fresh water before migrating to the ocean in the spring as smolts.	R1: Gillnet, purse seine R2: Gillnet R3: Gillnet R4: Purse seine, gillnet

Note, gillnet may include both drift and set net (unless type is specified i.e. drift gillnet).

Key literature reference at:

- http://www.adfg.state.ak.us/pubs/notebook/fish/Chinook.php
- http://www.adfg.state.ak.us/pubs/notebook/fish/chum.php
- http://www.adfg.state.ak.us/pubs/notebook/fish/coho.php
- http://www.adfg.state.ak.us/pubs/notebook/fish/pink.php
- http://www.adfg.state.ak.us/pubs/notebook/fish/sockeye.php

3.2 Fishery Location(s)

ADFG divides the salmon fisheries, geographically for management purposes into 4 major fishery management regions (R1-Southeast, R2-Central, R3-Arctic-Yukon-Kuskokwim, and R4-Westward). These are shown in Figure 1.

Each region is managed by regionally based ADFG staff who are assigned the in-season responsibility for management over salmon fisheries.

Within each of these regions, there are a series of Management Areas, with one or more Area Management Biologists assigned in each case. Management Areas are further divided into Districts, which represent watersheds and coastlines, which can extend well into the marine environment for certain fisheries such as troll fisheries.

Detailed maps for statewide Alaska salmon fisheries locations are available in Appendix 3 (Figure 1-16). These include maps for:

Region 1. Southeast Alaska/Yakutat (Fig. 1: Juneau and Northern Southeast Alaska Area, Fig. 2: Ketchikan and Southern Southeast Alaska Areas, Fig. 3: Sitka & Central Southeast Alaska Areas, Fig. 4: Yakutat &NW Southeast Alaska Areas)

Region 2. Central (Fig. 5: Prince William Sound, Fig. 6: Cook Inlet and Fig. 7: Bristol Bay Areas).

Region 3. Arctic-Yukon-Kuskokwim (Fig. 8: Kotzebue, Fig. 9: Norton Sound-Port Clarence, Fig. 10: Yukon Northern, Fig. 11: Upper Yukon, Fig. 12: Lower Yukon and Fig. 13: Kuskokwim Areas).

Region 4. Westward (Fig. 14: Kodiak, Fig. 15: Aleutians and Fig. 16: Chignik Areas).

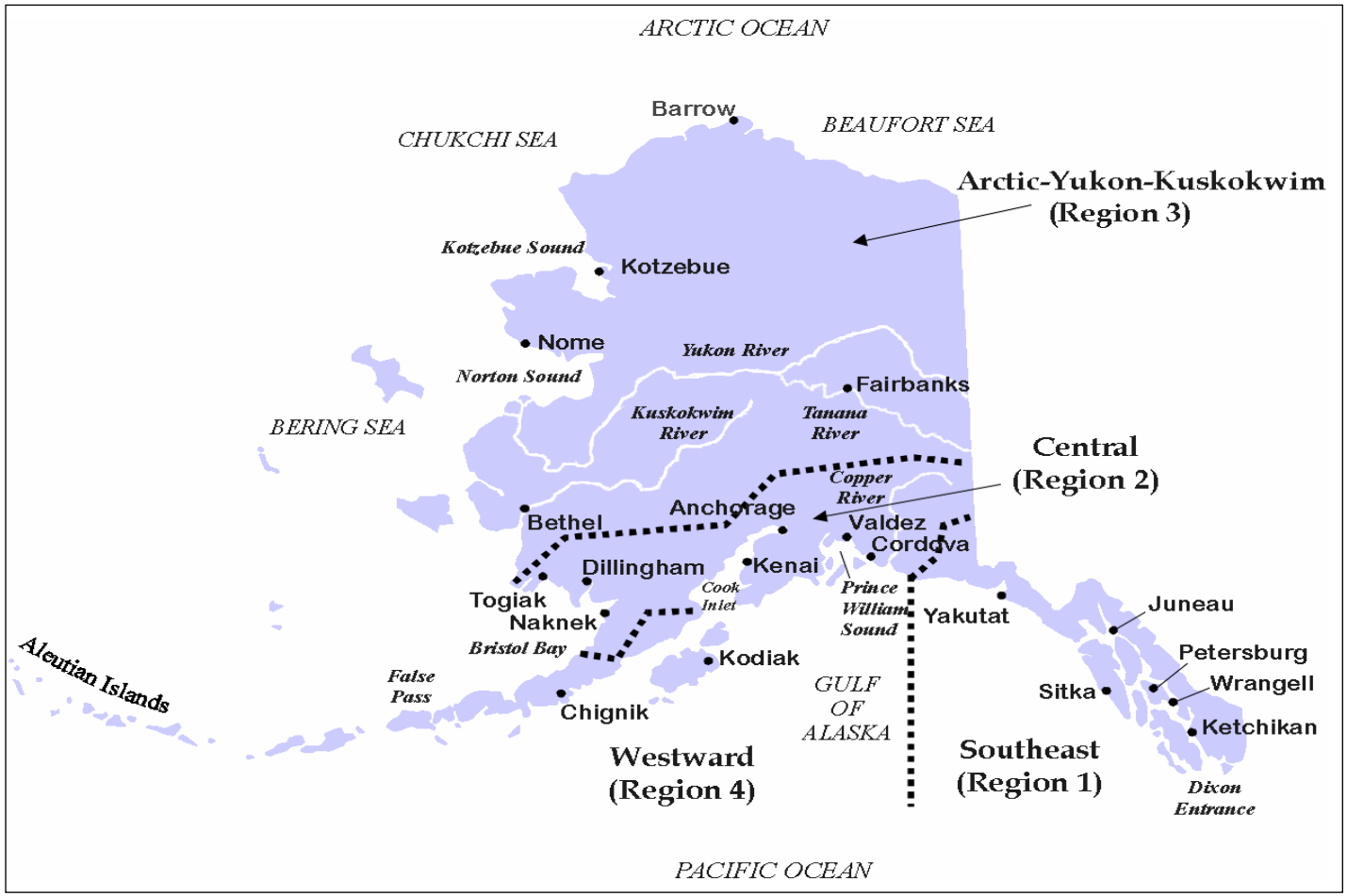

Figure 1. The 4 fishery management regions (Southeast, Central, Arctic-Yukon-Kuskokwim, and Westward) of the Alaska Department of Fish and Game, Division of Commercial Fisheries. (from *Eggers, D. M., M. D. Plotnick, and A. M. Carroll. 2010. Run forecasts and harvest projections for 2010 Alaska salmon fisheries and review of the 2009 season. Alaska Department of Fish and Game, Special Publication No. 10-02, Anchorage).*

3.3 Fishery Management History and Organization

Commercial salmon fishing in Alaska began in the 1880s. These harvests were primarily salted until canning became predominant at the turn of the century. After Alaska was purchased by the United States in 1867, the U.S. federal government had jurisdiction over these fisheries and the White Act, passed in 1924, required a closure of each fishery after the halfway point of the runs. At that time, much of the catch was taken in large fish traps and federal management was ineffectively enforced and poorly funded. Consequently, the fishery was managed for maximum economic return and there were few conservation-based input or output controls.

After World War II and at the request of the salmon processing industry, W. F. Thompson of the University of Washington began investigations of salmon and the salmon management program in Alaska. After Statehood in 1959, ADFG implemented an escapement goal-based fisheries management system using principles laid out by W. F. Thompson and his students. Principally, it is this science-based management system that remains in place today (Woodby *et al.*, 2005).

Consequently, Alaska's salmon fisheries have been rebuilt from the low levels that prevailed at the end of the territorial period to the highest level of sustained production recorded since commercial fishing began in 1878 (ADFG). The management system that utilizes both federal and state statutes (laws) provides authority to local area biologists to manage the resources locally, in an effective decision-making manner, based on real time information. This allows fishing opportunities to be maximized, without compromise to the over-riding policies of sustained use and conservation.

It is the combination of local authority and transparent, accessible overarching legal framework (which includes: comprehensive research, analysis, and planning; plus effective stakeholder participation) that makes the management of Alaska salmon fisheries both effective and successful.

Figure 2 below shows the historical harvest of Alaska salmon (all species by all gears and regions 1878-2008) from the ADFG website. Average catches over the last 5 years have been 167 million fish compared to catches of circa 20 million fish in the early 1970s. The graph clearly shows the impact of input controls (limited entry in 1978) on the progressive development of the fishery.

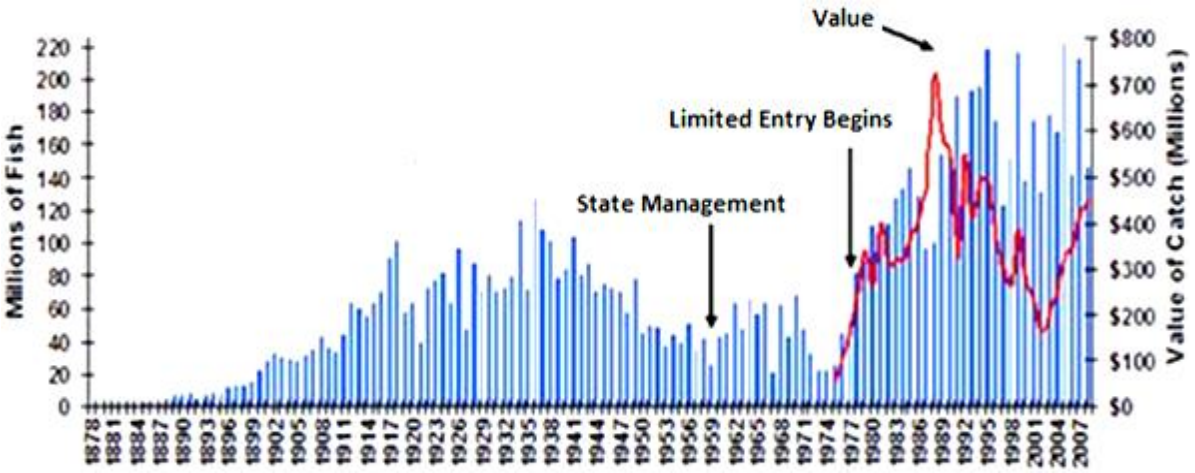

Figure 2. Alaska Commercial salmon catches & value 1878-2008 all species combined (http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmoncatch).

Currently, the 2010 harvest of 168.6 million salmon is the 11th largest harvest since statehood. The 2010 harvest is 5.6 million fish greater than the 2009 harvest of 162.9 million fish, 31.3 million fish above the preseason forecast of 137.3 million fish, and 1.1 million fish above the most recent 10 year average commercial harvest of 167.5 million salmon (http://www.adfg.state.ak.us/news/2010/11-8-10_nr.php).

Alaska's fisheries management system can be described as organized and has served well for over five decades, as demonstrated by the sustainability of Alaska's salmon harvests. The BoF sets harvest policies, regulations, and allocations, and ADFG conducts biological research enforcing the BoF's decisions.

The dominant goal is the harvest policy known as "fixed escapement". This means that management's first priority is to ensure that sufficient numbers of adult spawning salmon escape capture in the fishery and are allowed to spawn in the rivers, thus maintaining the long-term health of the stocks. All human uses of salmon, especially commercial fishing, are subordinate to this guiding principle.

Because of the natural variability of environmental conditions such as El Niño, the total number of adult fish returning to spawn may vary. In order to maintain a fixed escapement, it is the commercial harvest that fluctuates from year to year.

An example of the harvest fluctuation for the Copper River sockeye (in Central region 2) from 1988 to 1998 is provided below in Figure 3. Note in the figure that a) the catch rises and falls in proportion to the abundance, and b) the catch is always a fraction of the total run size. The salmon fisheries are tactically managed while they are actually taking place. Alaska has been said to lead the way with its in-season salmon management approach, which has become recognized among fisheries management agencies around the world. In addition, the in-season management decisions are made from a local office, by the biologists most knowledgeable in that fishery allowing ADFG to react to the natural variability of the runs during seasons. ADFG manages over 15,000 salmon streams throughout the state (http://www.alaskaseafood.org/retailers/practices/pages/buyerguide-salmon/index2.html).

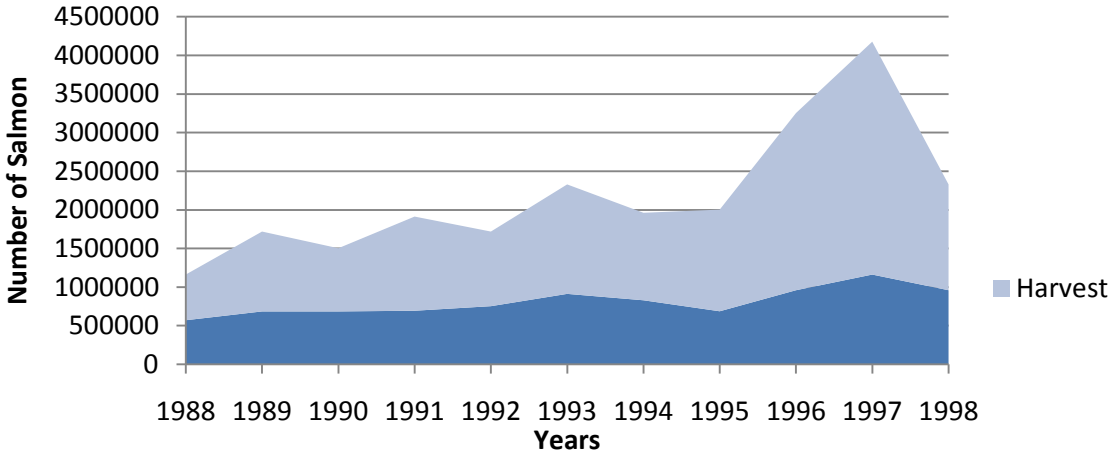

Figure 3. Copper River sockeye salmon escapement and harvest numbers (total run size) from 1988 to 1998 (http://www.alaskaseafood.org/retailers/practices/pages/buyerguide-salmon/index2.html).

State and Federal Management Regimes

Article VIII of the Alaska Constitution is dedicated to natural resources. In 1973, the Alaska legislature passed a bill creating the first comprehensive limited entry program in the United States. The limited entry program implemented for commercial salmon fisheries in Alaska stabilized the number of fishermen and therefore the amount of gear used in each of the State's salmon fisheries. Furthermore, the 1985 Pacific Salmon Treaty established an International management regime designed to rebuild some salmon stocks, limit harvests in specific fisheries, and define equitable allocations between U.S and Canadian fishermen (Woodby 2005). In 1976, Congress adopted the Magnuson-Stevens Fisheries Management and Conservation Act (MSFCMA). This legislation extended U.S. control of its fishery resources from 3 miles offshore to 200 miles offshore. The high seas harvest of Alaskan salmon stocks was substantially reduced immediately after passage of the MSFCMA.

Authority for the management of the subsistence and commercial salmon fisheries of Alaska was primarily vested with ADFG, Division of Commercial Fisheries at statehood. The Alaska Board of Fish and Game and later the Alaska Board of Fisheries, was formed in 1975. The BoF is a citizen based organizations that makes decisions on the allocation of the fishery resources for each region and fishery. By taking on the task of resolving fisheries disputes the BoF takes the politically charged decision of allocation away from decisions in conservation.

3.4 ADFG and Board of Fisheries (BoF) Functions

ADFG Commercial Fisheries Division Functions

ADFG is organized into a series of Divisions with specific but often interrelated management functions. The principal Division responsible for the management and conservation of Alaska's commercial fisheries is the Commercial Fisheries Division. Key functions include:

- Stock Assessment & Applied Research: Maintain ongoing programs for the enumeration, assessment, and understanding of salmon stocks.
- Harvest Management: Control the harvest of fishery resources for subsistence, commercial, and personal uses according to plans and regulations.
- Laboratory Services: Operate three fisheries laboratories, for genetic identification, fish pathology, and ageing/tagging research.
- Aquaculture Permitting: Permit and provide regulatory, technical, and planning services to aquatic farmers and private nonprofit hatchery operators.
- Information Services and Public Participation: Develop and maintain dissemination of data, analyses, and published reports

The Assessment Team acknowledges that the additional Divisions of ADFG have valuable roles in the management of Alaska fisheries; including salmon (refer to Section 5). Where these are prevalent, the Assessment Team has included them in the analysis. However, it is also noteworthy that this

assessment is for the commercial salmon fisheries of Alaska and does not include sports, personal use, subsistence and cost recovery fishery. These fisheries will not be eligible for certification based on the outcome of this report.

The Division of Commercial Fisheries operates 23 area offices, which are organized into four regions and staffed with area management biologists. These area management biologists are provided with fishery management authority to address the rapidly changing in season fishery management needs of the salmon fisheries in Alaska. The BoF is defined in AS 16.05.251 as "for purposes of the conservation and development of the fishery resources of the State. It is composed of 7 members appointed by the governor of Alaska, subject to confirmation by a majority of the members of the legislature in joint session".

In 2000, the Policy for the Management of Sustainable Salmon Fisheries was adopted into state regulation (5 AAC 39.222). The landmark policy updates and strengthens long-standing principles of Alaska's salmon management program. Most importantly, it directs ADFG and the BoF to follow a systematic process for evaluating the health of salmon stocks throughout the state by requiring ADFG to provide the BoF, in concert with its regulatory cycle, with reports on the status of salmon stocks and fisheries under consideration for regulatory changes. The policy also defined a new process for identifying stocks of concern (stocks which have not met escapement goals or yield expectations), and requires ADFG and the Alaska BoF to develop action plans to rebuild these stocks through the use of management measures, improved research, and restoring and protecting habitat.

Three levels of concern are identified; (1) a yield concern is the least severe and results from an inability to maintain expected harvest levels over a 4- to 5-year period, (2) a management concern relates to the inability to maintain escapements within escapement goal ranges over a 4- to 5-year period despite the use of management measures, and (3) a conservation concern is the most severe and relates to the inability over a 4- to 5-year period to maintain escapements above a minimum threshold below which the stock's ability to sustain itself is jeopardized. The goals are classified either as "biological escapement goals," which are scientifically-based and represent the escapement estimated to provide the greatest potential for maximum sustained yield, or as "sustainable escapement goals," which represent an escapement level that is known to provide for sustained yield over a 5- to 10-year period.

The North Pacific Fishery Management Council (NPFMC) has developed a management plan for salmon caught in waters from 3 to 200 miles offshore Alaska and the National Marine Fisheries Service (NMFS) delegated authority to manage salmon fisheries in this area to the state of Alaska (Clark *et al.*, 2006). The role of NPFMC is to amend the Federal Management Plan (FMP) for salmon when necessary. As noted, it defers regulation of the commercial troll and recreational salmon fisheries in the Exclusive Economic Zone (EEZ) to ADFG since almost all salmon fishing takes place in state managed waters. The Council does reserve the right to specify management measures applicable to the EEZ that differ from those of the State if it deems the State actions to be inconsistent with this FMP or the Magnuson Act but, ADFG is the principal management organization for Alaska salmon fisheries.

The Board of Fisheries (BoF)

- The BoF's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The BoF is charged with making allocative decisions, and ADFG is responsible for management based on those decisions.

The BoF consists of seven members serving three-year terms. Members are appointed by the Governor of Alaska, and confirmed by the State Legislature (Figure 4, 5). Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the BoF, with a view to providing diversity of interest and points of view in the membership.
The BoF meets four to six times per year in communities around the state, to consider proposed changes to fisheries regulations. The BoF uses the biological and socioeconomic information provided by the ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law when creating regulations that are sound and enforceable.

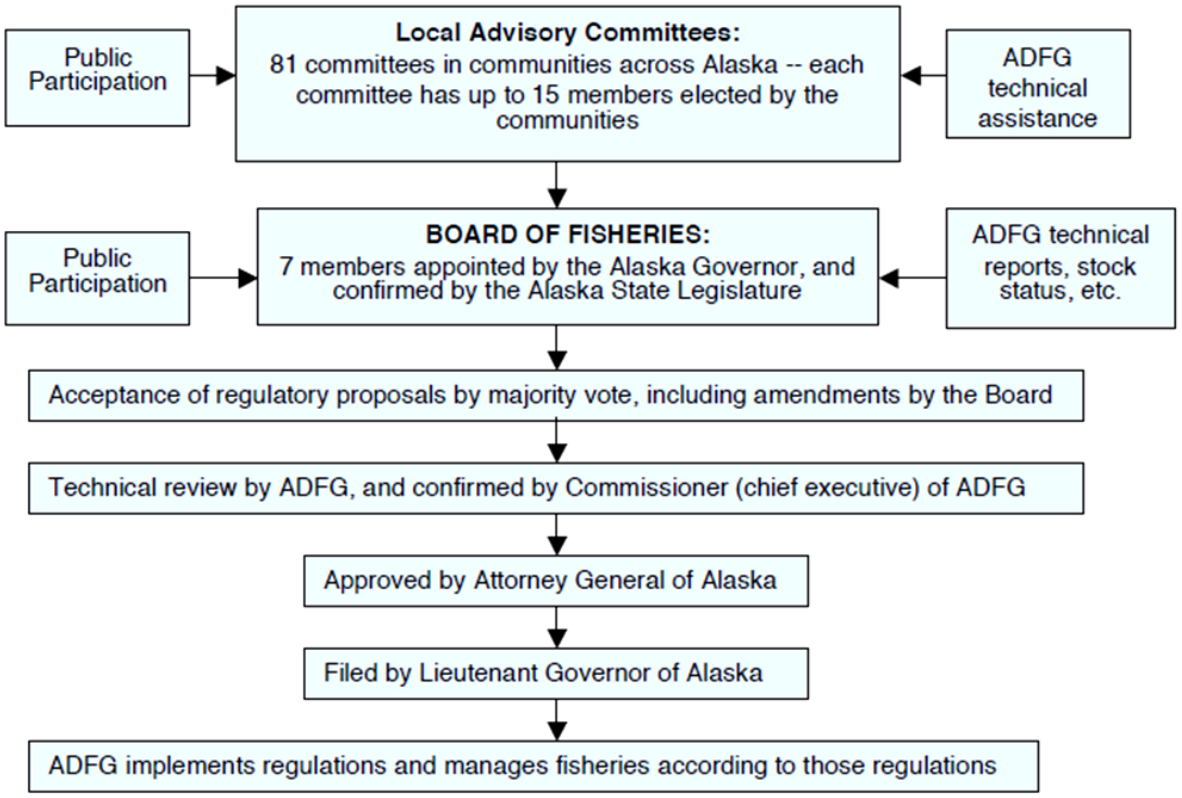

Figure 4. Functional management process of the fishery.

During the Assessment Team's visit to the BoF meeting in Homer on the November 15-19th specific to the Lower Cook Inlet Cycle of meetings, a presentation was provided by Jim Marcotte, Executive Director of the BoF, describing the appointment, role and management process of the BoF (Jim Marcotte, 2010 BoF powerpoint Presentation). As testified by the witnessing of these BoF meetings, the BoF's decision making process can be verified as public and transparent. For example, members of the public can attend the meetings and if desirable, make individual representation to the BoF through a defined and accessible process.

ADFG can be described as analogous to the federal NMFS Agency for federally managed fisheries, in that they conduct biological studies, and set either total allowable catch (TACs) or escapement goals, as appropriate to a fishery – and thereby they make conservation decisions. The role of the BoF is analogous to that of the NPFMC, in that they make allocation decisions, after the conservation decisions have been made.

The cycle of meetings generally occurs from October to March with all fisheries up for consideration by the BoF during that cycle being considered, including commercial, sports, subsistence and personal use. There is also a special petition agenda change request procedure available for the BoF to consider out-of-cycle requests.
Additionally, any proposal submitted by the NMFS will be considered during the current cycle of meetings (5 AAC 39.999 Policy Changing Board Agenda (3)(b)).

The meeting cycle is set out for 2010-2011 and available at http://www.boards.adfg.state.ak.us. Proposals to the BoF are published for each cycle of meetings, such as the 2010-11 BoF's cycle at http://www.boards.adfg.state.ak.us/fishinfo/meetinfo/2010_2011/2010-2011-bof-prop-final.pdf.

Either an individual or a group may make a proposal to the BoF with respect to amendments to State legislature that may impact upon the interests of the proposer. A standard format and direction/advice to submitting proposals is provided by the BoF. An analysis of proposals to the BoF for 2006-2007 revealed that over 50% of proposals came from individuals. The remaining proposals split between advisory committees, village councils, groups and associations, ADFG and the BoF. Generally, one third of the proposals are adopted into regulations (Jim Marcotte, 2010 BoF powerpoint Presentation).

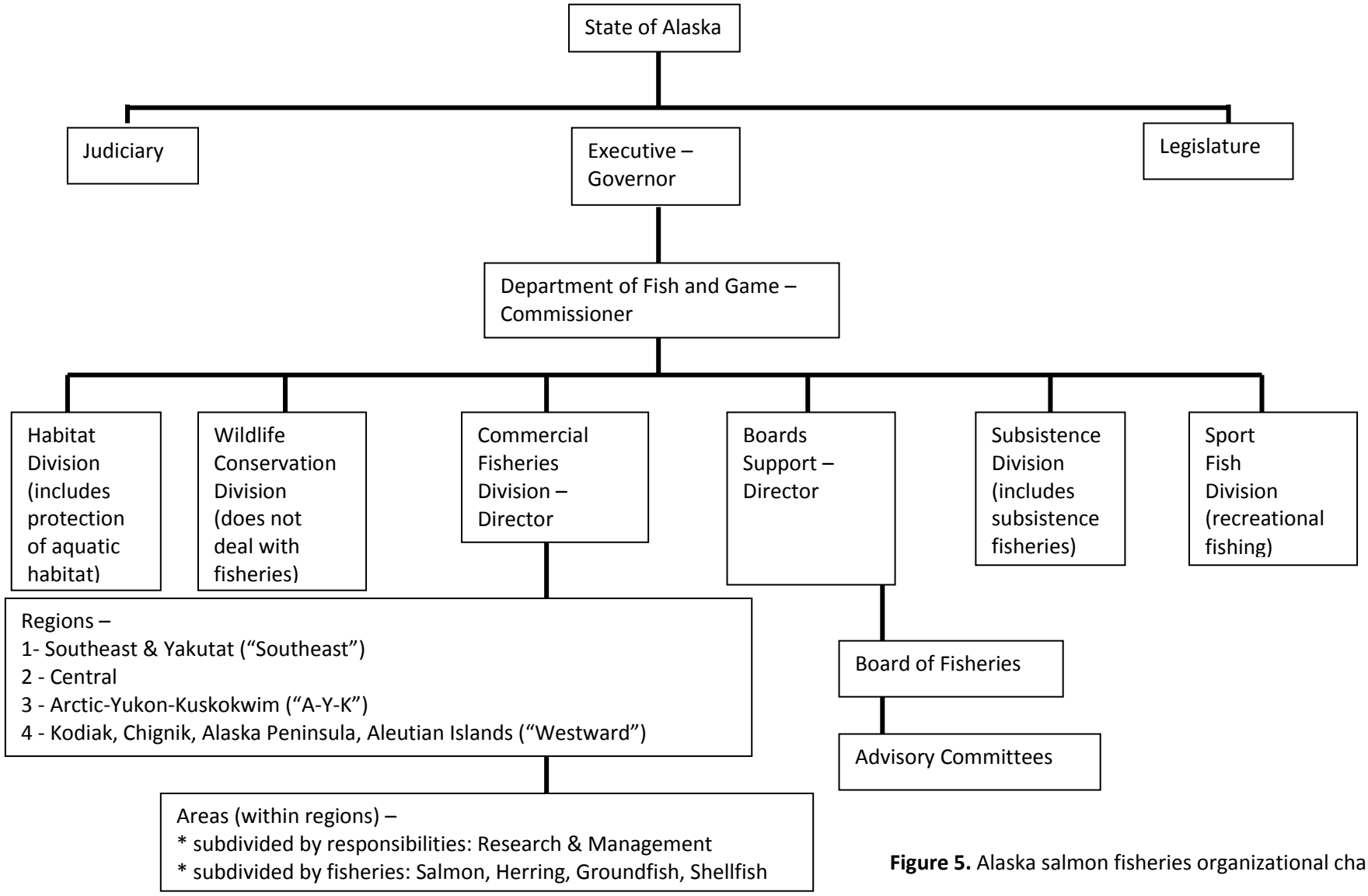

Figure 5. Alaska salmon fisheries organizational chart.

3.5 Regional Organization and Productivity of Salmon Fisheries

Commercial salmon harvests in each ADFG Regulatory area is carried out mainly by: purse seiners, gillnetters (set or drift gillnet), and trollers. All gear types used in Alaska salmon commercial fisheries are regulated through state statutes & regulations for design and deployment specifications, often specific to individual regions and areas. Regulations for each region are readily available to all fishers and public at each area office of ADFG and Alaska State Wildlife Troopers. Reader should refer to the ADFG booklets: '2008-2011 Chignik and Kodiak Areas Commercial Salmon Fishing Regulations', '2007-2010 Bristol Bay, Alaska Peninsula, Atka-Amilia, and Aleutian Island Areas Commercial Salmon Fishing Regulations', '2009-2012 Prince William Sound Commercial Salmon Fishing Regulations', and '2008-2011 Cook Inlet Area Commercial Salmon Fishing Regulations'.

Fishing Methods

Purse Seining

Purse seiners (Figure 6) catch primarily pink salmon by encircling them with a long net and drawing (pursing) the bottom closed to capture the fish. The net is first stacked on the stern of the boat and then played into the water while the boat travels in a large circle around the fish. The far end of the net is attached to a power skiff, which holds the net while the seiner completes the circle. The top of the net stays on the surface of the water because of the float line (comprised of colored floats) and the bottom of the net falls vertically because of its weighted lead line. The lines and the net are then pulled up with a hydraulic power block (winch). Once most of the net has been retrieved, with the remainder of it lying in a *bag* alongside the vessel, the fish are dipped from the bag and into the vessel hold http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/whatkindofboat_cf.pdf. Directed purse seine fisheries for Alaska salmon include the following: Southeast/Yakutat Region - Seine Northern and Southern District, the Central Region - Prince William Sound and Lower Cook Inlet; Westward Region - Kodiak, Chignik, North & South Peninsula, and the Aleutian Islands purse seine fisheries.

Figure 6. Purse seiner
http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.main.

Gill netting (Set and Driftnets)

Gillnetters (Figure 7) catch salmon – primarily sockeye, chum, and coho – by setting curtain like nets perpendicular to the direction in which the fish are travelling as they migrate along the coast toward their natal streams. The net has a floatline on the top and a weighted lead line on the bottom. The mesh openings are designed for salmon to get their head stuck, or *gilled,* in the mesh. Gillnets work best in silty or turbid water which makes them difficult for the fish to see. Gillnet vessels are usually 30 to 40 feet long. Net retrieval is by hydraulic power which turns a drum. Fish are removed from the net by hand, collecting them from the mesh as the net is reeled onboard. Set-netting is a small scale type of gillnetting done by hand from a skiff or from shore, usually by local families. There is no hydraulics. Net are fixed and are held onshore or offshore with anchors. Skiffs are used to set nets – one end on shore, the other anchored offshore. Driftnets, on the other hand, are left drifting with the current usually close to the surface. Like setnets, driftnets have a floatline on the top and a weighted lead line on the bottom to keep them vertical. These nets are connected to the vessel and catch salmon using the same setnet underlying mechanism (http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/whatkindofboat_cf.pdf). Typical Alaska salmon Gillnet fisheries include: the SE/Yakutat Region - Tree Point Gillnet; Central Region - Prince William Sound, Eshamy District Drift/Set gillnet, the Upper Cook Inlet UCI Set/Drift Gillnet, The Bristol Bay Naknek-Kvichak Drift/Set Gillnet; the AYK Region Kuskokwim Bay Gillnet; and the Westward Region- Kodiak gillnet fishery.

Figure 7. Gillnetter http://www.cf.adfg.state.ak.us/geninfo/pubs/pubshome.php#vessels.

Salmon Trolling

Troll vessels (Figure 8) catch salmon, principally Chinook and coho by "trolling" bait or lures through feeding concentrations of fish. Typically, four to six main wire lines are fished, each of which may have up to a 50 pound lead or cast iron sinker or *cannon ball* on its terminal end, and 8 to 12 nylon leaders spaced out along its length, each of which ends in either a lure or baited hook. To retrieve hooked fish, the main lines are wound about small, onboard spools via hand crank (hand trollers) or with hydraulic power (power trollers), and the fish are gaffed when alongside the vessel http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/whatkindofboat_cf.pdf. Typical Alaska salmon fisheries include the SE/Yakutat Region Troll fishery.

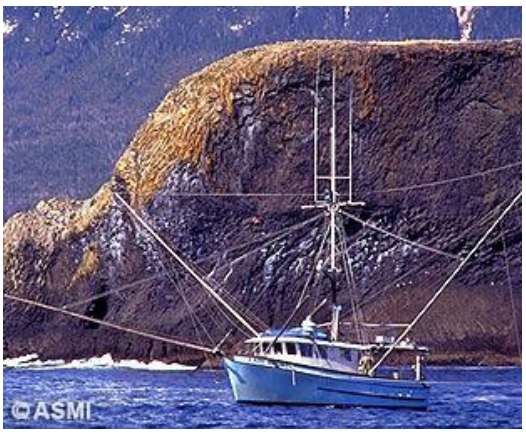

Figure 8. Salmon troller http://www.cf.adfg.state.ak.us/geninfo/pubs/pubshome.php#vessels.

All the fisheries for Alaska salmon follow and target the seasonality of the different salmon species returning every year to statewide Alaska. A descriptive figure (Table 2) is provided below.

Table 2. Seasonality of Alaska salmon.

Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chinook												
Sockeye												
Coho												
Pink												
Chum												

Source: http://www.alaskaseafood.org/information/seasons/index.html.

3.6 Abundance of Alaska Salmon Species

Pink salmon are the most numerous of the salmon species in the Alaska commercial catch and the most abundant salmon in the Pacific Ocean. Annual statewide commercial harvests have been around 100 million pink salmon since about 1990. In Alaska, pink salmon are harvested primarily by commercial purse seine fleets. Much of the pink salmon harvest is canned.

Sockeye salmon are the second most numerous in the Alaska commercial catch and the third most abundant salmon in the Pacific Ocean. Annual statewide commercial harvests of sockeye salmon have ranged from about 20 to 60 million fish over the past 35 years. In Alaska, most sockeye salmon are harvested by gillnets, or in some cases, in seine gear in limited areas. The Bristol Bay sockeye run is one of Alaska's most important commercial fisheries and the run is harvested as the returning adult salmon migrate past the Alaska Peninsula in June and then as they pass the large gillnet fisheries in Bristol Bay. Subsistence users harvest sockeye salmon in many areas of Alaska. The greatest subsistence harvest of sockeye salmon probably occurs in the Bristol Bay area where participants use set gillnets. In other areas of the state, sockeye salmon may be taken for subsistence use in fish wheels (beach seines and gillnets are also used for subsistence sockeye harvest in SE Alaska).

Chum salmon are the third most numerous salmon species in the Alaska commercial catch and the second most abundant salmon in the Pacific Ocean. Annual statewide commercial harvests of chum salmon have been around 20 million fish since the early 1990s. In Alaska, chum salmon are harvested primarily by gillnet and purse seine fleets. This species is also important in subsistence fisheries in Western Alaska.

Coho salmon are the fourth most numerous in the Alaska commercial catch and the fourth most abundant salmon in the Pacific Ocean. Recent annual statewide commercial harvests have been near 5 million fish. Coho salmon are generally the latest spawners in Alaska, with runs well into the fall or even early winter. Because of their late run timing, many coho salmon runs in Alaska may be lightly exploited or even unexploited. Because of poor weather during the coho salmon spawning period, less information exists about run size and timing in many areas of the state.

Chinook salmon are the least abundant of the five salmon species found on both sides of the Pacific Ocean and the least numerous in the Alaska commercial harvest. Recent annual statewide commercial harvests have been around one-half million fish. In Alaska, Chinook salmon are important in sport and personal use fisheries, as well as commercial troll and net fisheries. A Southeast Alaska troll fishery, under a treaty agreement between the governments of the US and Canada, operates on mixed stocks of migrating Chinook salmon throughout the year, providing consumers with fresh Chinook salmon during the winter (http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmon_harvest.php).

ADFG Administrative Regions

The four administrative regions defined for Alaska salmon support a varied harvest of different salmon species from the use of multiple gear types. The main features of each region are described.

Region 1: SE/Yakutat

Southeast/Yakutat: Over 5,500 tributaries and streams, all species featured make Region 1 both an important and complex region for management. Harvest of all salmon increased in the 1930s with 60 million fish. Although in subsequent years the fisheries declined, in more recent history catches have returned to these levels. Since statehood 77% of the salmon harvested in Southeast Alaska commercial fisheries have been caught with purse seine gear. Pink salmon *Oncorhynchus gorbuscha* is the primary species targeted by the seine fleet, therefore most management actions are based on the abundance of pink salmon stocks. Chum salmon *O. keta* are targeted in or near hatchery terminal areas and the majority of the chum salmon harvest originates from hatchery production. Other species of salmon are harvested incidentally to pink and chum salmon. Over the recent 10-year period from 1999 through 2008 the species composition of the purse seine harvest has included 87% pink salmon, 11% chum salmon, 1.3% sockeye salmon *O. nerka*, and 0.7% coho salmon *O. kisutch*. Chinook salmon *O. tshawytscha* harvest percentages are insignificant compared with other species (2010 SE Alaska Purse Seine Management Plan).

Key Literature Reference-

http://www.sf.adfg.state.ak.us/FedAidpdfs/RIR.1J.2010.11.pdf
http://www.npafc.org/new/publications/Documents/PDF%202006/955(USA).pdf
http://www.psc.org/pubs/Treaty.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/FMR08-54.pdf

Region 2: Central

Prince William Sound: The 2009 Prince William Sound Area commercial salmon harvest was 24 million. The harvest was composed of 18.6 million pink, 1.9 million sockeye, 3.2 million chum, 300,000 coho, and 11,000 Chinook salmon. The 2009 harvest was composed of 15.9 million (66%) commercial CPF, and 8.2 million (34%) hatchery cost recovery fish. In 2010, in contrast with the previous year, the commercial salmon harvest was 77.9 million fish, more than three times higher than that of 2009 (mainly due to pink salmon harvest). The harvest was composed of 71.2 million pink, 2.0 million sockeye, 4.3 million chum, 357,000 coho, and 10,400 Chinook salmon. Of the total harvest, 71.6 million salmon were harvested in the CPF (92%), and 6.3 million (8%) as hatchery cost recovery fish. In PWS, for the gillnet fisheries of the Copper River District in 2010, the CPF harvest of 9,654 Chinook salmon was below the previous 10 year average harvest of 32,032. In the Bering River District, commercial gillnet harvest of coho salmon was 80,560; above the previous 10 year average of 51,759 coho. In the Unakwik District, the sockeye harvest of less than 100 was well below the 10 year average of 6,800 sockeye. The Port Chalmers gillnet harvest of 242,526 chum salmon was also below the five years CPF average of 666,000 chums. On the other hand, the PWS pink salmon harvest of 2010 (mainly purse seined) of 72.2 million pink salmon, was the highest on record exceeding the previous record of 63.5 million pink salmon harvested in 2007.

Bristol Bay: The Bristol Bay Annual commercial catches for the most recent 20-year span (1989–2008) average nearly 25.7 million sockeye, 64,900 Chinook, 947,000 chum, 97,000 coho, and 170,000 (even-years only) pink salmon. Subsistence catches are comprised primarily of sockeye salmon and average approximately 142,000 fish. Sport fisheries harvest all species of salmon, with most effort directed toward Chinook and coho salmon stocks.

Cook Inlet: The 2007 Lower Cook Inlet (LCI) all-species commercial salmon harvest of just over 662,000 fish was easily the lowest during the past decade, representing only one-third of the recent 10-year average of 2.027 million. The overall harvest failed to achieve the cumulative preseason forecast of 1.45 million fish, in large part due to much smaller than anticipated harvests of natural runs of pink salmon. The 2008 Upper Cook Inlet (UCI) commercial harvest of 2.5 million salmon was approximately 40% less than the 1966–2008 average annual harvest of 4.2 million fish, while the commercial sockeye salmon harvest estimate of 2.0 million fish was 30% below the 1966–2008 average annual harvest of 2.9 million fish. The 2009 UCI commercial harvest of 2.5 million salmon was approximately 1.7 million fish below the average long-term harvest in UCI.

Key Literature Reference-

http://www.sf.adfg.state.ak.us/FedAidPDFs/FMR10-25.pdf
http://www.sf.adfg.state.ak.us/FedAidpdfs/Fmr10-27.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr08-53.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr10-17.pdf
http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main
http://www.cf.adfg.state.ak.us/region2/finfish/salmon/pws/pwsfor10.pdf
http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf

Region 3: Arctic-Yukon-Kuskokwim

Kuskokwim: The 2009 District 1 Chinook, sockeye, and chum salmon harvests were well above their respective most recent (1999-2008) 10-year average harvests while the coho salmon harvest was below their most recent (1999-2008) 10-year average harvest. The District 4 Chinook salmon harvest was well below their most recent 10-year (1999-2008) average of 18,058 fish, while the sockeye salmon harvest was the highest on record and well above their most recent 10-year (1999-2008) average of 58,424 fish. The chum salmon harvest was also the highest on record and well above their most recent 10-year (1999-2008) average of 57,033 fish. Finally, the coho salmon harvest was below the most recent 10-year (1999-2008) average of 42,168 fish. The District 5 Chinook salmon harvest was below average compared to historical harvests. Both the sockeye and chum salmon harvests were above average, while the coho salmon harvest well below historical averages.

Yukon: The preliminary 2009 post season run size was estimated to be approximately 450,000 to 560,000 fall chum salmon, below the 1974–2008 average of all years and odd-numbered years of 876,000 and 687,000 fall chum salmon respectively. Coho salmon run timing was near normal, and the Pilot Station sonar passage estimate of 207,000 was well above the average of 163,000 for the project. The 2009 Yukon Area fall chum salmon commercial harvest was approximately 58% below the previous ten-year average (1999-2008) of 60,012 fish and 68% below the ten-year average of 25,060 coho salmon. Coho and Chinook salmon of the Yukon River area are also internationally important. Over half of the Yukon River Chinook salmon that are harvested in Alaska are in fact of Canadian-origin. In December 2002, the United States and Canada signed an agreement that set salmon harvest share target ranges based on a postseason assessment of run strength for Chinook and fall chum salmon into the Canadian mainstem of the Yukon River. For the 2010 season, the U.S./Canada panel agreed to a 1 year Canadian Interim Management Escapement Goal (IMEG) ranges of 42,500–55,000 Chinook salmon and 70,000–104,000 fall chum salmon. In addition to escapement needs, Alaska is obligated to share harvestable surpluses of the Canadian run component with Canada. Yukon River Chinook salmon are important to all users in the Yukon Area. Current run sizes are about half of historic levels, making it difficult to meet escapement goals and provide for subsistence uses on the river, and harvests have been greatly reduced since 2000. Despite good parent year escapements in 2007, 2008, and 2010, runs were below expectations and escapement goals into Canada were not met. Due to poor production in recent years, it is likely the 2011 Chinook run may not be sufficient to fully support subsistence needs, which may have to support subsistence conservation measures (such as voluntary reductions) in an effort to meet escapement goals. Forecasts for 2010 indicated the likelihood of not having a directed Chinook salmon commercial fishery on the mainstem Yukon River. As the preseason conservation strategy for Chinook stocks, no commercial periods targeting Chinook were allowed in 2010 in the Yukon River mainstream or in the Tanana River. However, the chum salmon commercial fishery in the Yukon River caught 9,897 Chinook as bycatch. Inseason management decisions were based on the best available assessment data (Pilot Station sonar preliminary cumulative passage from June 1st to August 9th of 113,410 Chinook) and the preseason outlook and management plan. The actual 2010 Chinook salmon run was weaker than expected. Consequently, most escapement results were disappointing. Chinook salmon escapement goals for the the East Fork Andreafsky, West Fork Andreafsky, and Salcha rivers were achieved. The Anvik and Chena river escapement goals were not achieved. Preliminary Chinook salmon passage at Eagle sonar is 35,128 fish, yielding a border passage of approximately 33,500 fish.

Arctic Norton Sound: Norton Sound Highlights of the 2009. Norton Sound District commercial salmon fishery included another top 10 harvest of coho salmon for the fifth year in a row, a record Sub-district 3 (Moses Point) coho salmon harvest, the best chum salmon harvest in over a decade and second highest average value of salmon catch per permit holder on record without adjusting for inflation. Disappointments in 2009 included one of the poorer runs of chum salmon to northern Norton Sound and the failure of the sockeye salmon run that resulted in no commercial fishing being allowed in Port Clarence District. The coho salmon harvest of 87,041 was nearly 15% below the recent 5-year average, but 45% above the recent 10-year average. The chum salmon harvest of 34,122 was nearly triple the 5-year average and was over triple the 10-year average. Increased buyer interest in chum and pink salmon also resulted in a pink salmon harvest of 17,364 fish, the highest odd-numbered year harvest since 1995.

Kotzebue: Kotzebue Commercial chum salmon harvests during the 20 years when there was a major buyer (1982-2001) ranged from 55,907 to 521,406 fish, the 20-year average being 220,720. The 5-year (1997-2001) average catch was 141,741. This significant decrease reflects the lack of demand for salmon on the open market that began in the mid-1990s as buyers began to purchase less salmon. Fishing effort during 1982–2001 ranged from 45 to 199 fishermen. The 20-year average was 129 fishermen; the 5-year average from 1997–2001 was 61 fishermen. The decrease in participation was likely due to substantial price declines and lack of market. In 2002, the last significant buyer in the commercial fishery decided to not purchase fish in Kotzebue. Because there was no major buyer only 3 permit holders fished in 2002. Likewise, in 2003 there were only 4 permit holders. In both 2002 and 2003, one permit holder became a licensed agent for a buyer outside of Kotzebue, and worked with other permit holders to provide product for that market. Beginning in 2004 one buyer provided a limited market for permit holders. The fishing effort (permits fished) over the last 5 years is one-quarter the fishing effort of 20 years ago. From 2004–2008 there were less than 50 permit holders participating in the commercial fishery each year with the average being 44 permit holders. In 2009 there was an increase to 62 permit holders participating in the fishery. The 2009 harvest of 187,562 chum salmon was the third best harvest in over a decade.

Key Literature Reference-

http://www.sf.adfg.state.ak.us/FedAidpdfs/RIR.3A.2010.04.PDF
http://www.sf.adfg.state.ak.us/FedAidpdfs/RIR.3A.2010.03.PDF
http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main
http://www.sf.adfg.state.ak.us/FedAidpdfs/RIR.3A.2010.02.pdf

Region 4: Westwards

Alaska Peninsula: The 2009 commercial salmon harvest in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Areas totaled 9,000 Chinook, 4.2 million sockeye, 316,000 coho, 9.8 million pink, and 1.8 million chum salmon. The commercial harvests of Chinook, coho, pink, and chum salmon were all above 2009 harvest projections and the most recent 10-year average harvest.

Chignik. A total of 3,319 Chinook salmon were commercially harvested in 2009, which was above recent average harvests. A total of 1.2 million sockeye salmon were commercially harvested in the Chignik Management Area (CMA) during 2009, which was similar to the prior 10-year average harvest and approximately 341,000 (40%) more than the prior 5-year average harvest. A total of 110,000 coho salmon were commercially harvested in 2009, which was greater than the prior 5- and 10-year average harvests. A total of 1.4 million pink salmon were commercially harvested in 2009, which was above the prior 5- and 10-year average harvests. A total of 256,000 chum salmon were commercially harvested in 2009, which was well above the prior 5- and 10-year average harvests (Eggers *et al.*, 2010).

Kodiak: Kodiak commercial fishing effort was once again low during the 2009 commercial salmon season although it increased slightly from 2008. Of the 608 eligible commercial salmon permits, only 291 (48 %) made commercial landings. The 2009 commercial sockeye harvest in the Kodiak Management Area (KMA) totaled 1.7 million. The harvest was below the recent 10-year average (2.9 million) but above the forecast (1.5 million). The commercial coho salmon harvest of 289,000 was below the forecast (422,000) and below the 1999–2008 average (397,000). Overall, the 2009 pink salmon harvest of 27.6 million was above the harvest forecast (22 million), and well above the past 5 odd-year (1999–2007) average harvest of 20.0 million, and also the previous 10-year average harvest of 19.1 million. The chum harvest of 964,000 was well above the forecast (623,000) and slightly above the 1999–2008 average (928,000) (Eggers *et al.*, 2010).

Key Literature Reference-

http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr0959.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/sp10-02.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr10-16.pdf
http://www.sf.adfg.state.ak.us/FedAidpdfs/fms07-10.pdf
http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-21.pdf
http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-10.pdf

Statewide Alaska 2010, Salmon Commercial Fisheries Forecasts and Harvest.

The 2010 total commercial salmon catch (all species) projection of 138 million was expected to include 143,000 Chinook salmon, 45.8 million sockeye salmon, 4.4 million coho salmon, 69.1 million pink salmon, and 18.0 million chum salmon. The projected pink salmon harvest was projected to be about 28% lower than the harvest experienced in 2009 (96.7 million).

The projected sockeye harvest was higher than the harvest in 2009, due to the expected increase in the sockeye harvest in Bristol Bay. Chum harvests were expected to be similar to those of 2009 (http://www.sf.adfg.state.ak.us/FedAidPDFs/sp10-02.pdf).

Table 3 gives the provisional 2010 commercial salmon harvest totals (including hatchery cost recovery) per region and pre-season catch projections (compiled by ADFG from the Blue Sheet). Official, final figures are published annually in May by ADFG for the preceding season once final tallies and winter troll fishing harvests are available. Note from table 3 that projections are available for all regions but are not fixed, as BEGs or SEGs are the target, and projections provide managers the ability to communicate fishing opportunities without compromising conservation goals.

Table 3. 2010 Harvests and Forecast Summarizes for the Alaska salmon commercial fishery by Region, area and species (in thousands of fish).

Region/Area	Chinook	Sockeye	Coho	Pink	Chum	TOTAL
Southeast/Yakutat Region 1						
Southeast Region Harvested Total	**214**	**671**	**1,916**	**23,401**	**8,886**	**35,088**
Southeast Region Forecasted Total	**n/a**	**1,241**	**2,435**	**19,000**	**9,371**	**32,420**
Central Region 2						
Prince William Sound						
PWS Harvested Total	**10**	**1,908**	**246**	**67,358**	**4,031**	**73,553**
PWS Total Forecasted	**25**	**2,597**	**548**	**30,032**	**3,705**	**36,907**
Cook Inlet						
Cook Inlet Harvested Total	**10**	**2,878**	**209**	**567**	**330**	**3,994**
Cook Inlet Forecasted Total	**20**	**2,711**	**213**	**872**	**155**	**3,653**
Bristol Bay						
Bristol Bay Harvested Total	**27**	**28,634**	**65**	**1,224**	**750**	**30,699**
Bristol Bay Forecasted Total	**42**	**30,530**	**76**	**87**	**1,641**	**32,377**
Central Region Harvested Total	**46**	**33,420**	**520**	**69,149**	**5,111**	**108,246**
Central Region Forecasted Total	**87**	**35,838**	**837**	**30,991**	**5,501**	**73,255**
Arctic-Yukon-Kuskokwim (AYK) Region 3						
AYK Region Harvested Total	**29**	**210**	**137**	**32**	**862**	**1,270**
AYK Region Forecasted Total	**25**	**175**	**320**	**225**	**870**	**1,614**
Westward Region 4						
Westward Region Harvested Total	**33**	**6,315**	**619**	**10,123**	**2,324**	**19,414**
Westward Region Forecasted Total	**32**	**8,507**	**766**	**18,882**	**2,228**	**30,415**
Alaska Harvested Totals	**323**	**40,615**	**3,192**	**102,704**	**17,183**	**164,018**
Alaska Forecasted Totals	**143**	**45,762**	**4,358**	**69,098**	**17,970**	**137,330**

Reference: **http://csfish.adfg.state.ak.us/BlueSheets/BLUEWebReport.php**. The forecasted totals have been extracted from ADFG at **http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmonforecast**.

3.7 Economic Performance of Alaska Salmon Fisheries

Alaska salmon has a significant impact on Alaska's economy. At the end of the 2010 salmon season, Alaska's commercial salmon fishermen returned the highest value in 18 years. The preliminary 2010 estimate indicates that the harvest generated $533.9 million, the highest exvessel value of any season since 1992. Economic spread of revenue is regularly analyzed. For example, just two areas, Bristol Bay and Prince William Sound, accounted for 55 percent of the total value of all salmon harvested in 2010 (Table 4 below).

Preliminary 2010 statewide average prices show increases for all species of salmon compared to final 2009 prices. The increase continues a strong recovery trend from the low salmon prices of 2002. Coupled with this strong economic development, there is also strong evidence that supports sustainable management of the salmon fisheries through adherence to the Sustainable Salmon Policy as implemented in the numerous management plans and escapement goals. Hence, there is good evidence of a responsible fisheries management system that is delivering both conservation and economic objectives for the sustainability of Alaska salmon fisheries.

Detailed economic analysis of Alaska's salmon fisheries is undertaken routinely by ADFG and through contracted economic fishery specialists (e.g. McDowell & Assoc). The results of which are made publically available so that this information forms part of future management discussions and decisions on allocation and conservation.

Table 4. Alaska salmon fishery economics for 2010 detailing the value of Chinook, sockeye, coho, pink and chum salmon. The most valuable fishery in 2010 was the sockeye fishery with a value of $252 million. The largest by volume was the pink salmon fishery with a total yield of 398 million lbs.

2010						
Area	Species	Avg. Wt. (pounds)	Avg. Price per Pound	Number of Fish (thousands)	Lbs. of Fish (thousands)	Est. Value US$ (thousands)
SOUTHEAST						
	CHINOOK	14.47	$4.05	249	3,610	$14,608
	SOCKEYE	5.89	$1.64	717	4,222	$6,912
	COHO	7.45	$1.19	2,507	18,678	$22,246
	PINK	4.25	$0.30	24,195	102,739	$31,059
	CHUM	8.34	$0.72	9,443	78,801	$56,415
	totals			**37,112**	**208,050**	**$131,240**
PRINCE WILLIAM SOUND						
	CHINOOK	19.62	$5.37	10	191	$1,025
	SOCKEYE	6.15	$1.99	1,930	11,872	$23,652
	COHO	8.76	$1.18	333	2,922	$3,447
	PINK	3.66	$0.36	69,083	252,845	$92,097
	CHUM	6.98	$0.80	4,087	28,529	$22,862
	totals			**75,444**	**296,357**	**$143,082**

COOK INLET						
	CHINOOK	20.70	$1.75	10	206	$361
	SOCKEYE	6.12	$1.75	2,921	17,878	$31,365
	COHO	6.59	$0.80	210	1,383	$1,109
	PINK	3.95	$0.29	571	2,253	$643
	CHUM	7.24	$0.63	323	2,341	$1,475
	totals			**4,035**	**24,060**	**$34,953**
BRISTOL BAY						
	CHINOOK	14.70	$0.98	31	461	$449
	SOCKEYE	5.50	$0.95	28,595	155,949	$148,703
	COHO	8.90	$0.53	104	931	$497
	PINK	3.20	$0.37	1,340	4,320	$1,578
	CHUM	6.40	$0.27	1,091	6,989	$1,888
	totals			**31,161**	**168,650**	**$153,115**
KODIAK						
	CHINOOK	7.97	$1.03	15	116	$119
	SOCKEYE	5.35	$1.38	1,437	7,688	$10,617
	COHO	7.54	$0.68	266	2,001	$1,357
	PINK	3.63	$0.41	8,842	32,090	$13,032
	CHUM	7.67	$0.49	735	5,638	$2,782
	totals			**11,293**	**47,533**	**$27,908**
CHIGNIK						
	CHINOOK	10.01	$1.56	10	103	$160
	SOCKEYE	6.51	$1.26	1,372	8,940	$11,272
	COHO	7.15	$0.50	159	1,138	$566
	PINK	3.40	$0.34	490	1,664	$566
	CHUM	7.63	$0.40	581	4,437	$1,775
	totals			**2,612**	**16,282**	**$14,339**
AK PEN/ALEUTIAN IS.						
	CHINOOK	13.84	$1.04	11	147	$153
	SOCKEYE	5.72	$0.91	3,505	20,046	$18,244
	COHO	7.10	$0.47	227	1,611	$758
	PINK	2.96	$0.28	867	2,566	$725
	CHUM	7.09	$0.38	1,054	7,477	$2,831
	totals			**5,664**	**31,846**	**$22,710**
KUSKOKWIM						
	CHINOOK	13.11	$1.60	19	245	$392
	SOCKEYE	6.81	$1.13	202	1,376	$1,551
	COHO	7.05	$1.01	77	540	$545

	PINK					
	CHUM	6.87	$0.26	227	1,558	$406
	totals			**524**	**3,718**	**$2,895**
YUKON						
	CHINOOK	12.92	$4.99	10	128	$638
	SOCKEYE					
	COHO	6.39	$0.97	4	24	$23
	PINK					
	CHUM	6.19	$0.61	235	1,458	$889
	totals			**249**	**1,610**	**$1,550**
NORTON SOUND						
	CHINOOK	14.38	$2.25	<1	2	$4
	SOCKEYE	7.56	$0.63	<1	1	<$1
	COHO	7.62	$1.47	62	473	$693
	PINK	2.79	$0.32	32	88	$28
	CHUM	6.79	$0.62	118	800	$494
	totals			**212**	**1,363**	**$1,220**
KOTZEBUE						
	CHINOOK					
	SOCKEYE					
	COHO					
	PINK					
	CHUM	7.99	$0.40	270	2,160	$860
	totals			**270**	**2,160**	**$860**
ALASKA TOTALS						
	CHINOOK	14.28	$3.44	365	5,208	$17,909
	SOCKEYE	5.60	$1.11	40,679	227,971	$252,316
	COHO	7.52	$1.05	3,948	29,699	$31,242
	PINK	3.78	$0.35	105,420	398,564	$139,728
	CHUM	7.72	$0.66	18,165	140,188	$92,676
	Totals			**168,576**	**801,630**	**$533,872**

[a] Final figures may not total exactly due to rounding.
Estimates based on fish tickets and reports from Area Managers.

Source: http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.exvesselquery .

A large share of the economic value of Alaska salmon can be attributed to the enhanced fishery program which accounts for a significant number of returning salmon. In 2010 for example, over 51 million fish were projected to return from Alaska hatchery releases (http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf).

3.8 Management of Enhanced Fisheries

Of the preliminary total statewide commercial salmon harvest of 162 million fish valued at $370 million exvessel in 2009, there was an estimated 28 million, or 19%, produced by the Alaska salmon enhancement program. Enhanced salmon provided an estimated $62 million or 18% of the ex-vessel value of the statewide common property commercial harvest. The ocean ranching program employs hundreds of Alaskans in seasonal and fulltime jobs. An analysis of enhanced fisheries for each major region is presented.

ADFG oversees and regulates all state and private sector salmon enhancement and rehabilitation projects. Protection of Alaska's natural salmon stocks requires stringent permitting processes. Geneticists, pathologists, and biologists review all projects prior to the issuance of a permit to operate a salmon hatchery, transfer eggs or fish, or release any fish into the Alaska waters. Pathology, genetic, coded wire tag, and otolith processing laboratories are maintained to provide information to both ADFG fishery managers, and inseason and technical expertise to the private sector. In 2009, hatchery operators collected over 1.7 billion eggs and released over 1.4 billion juvenile fish. An estimated 45 million adult salmon from enhancement projects returned (combined total common property, cost recovery and broodfish). The projection for 2010 was 51 million salmon (http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf).

Prince William Sound and Southeast Alaska are the regions in the state with the greatest amount of salmon enhancement, and pink and chum salmon are the predominant species produced. The Cook Inlet and Kodiak regions also have salmon enhancement programs. Production levels, in terms of egg takes and releases, have largely remained stable. Enhancement programs have matured and are generally operating at current planned capacities. The Alaska salmon enhancement program is composed of the following:

- 20 private non-profit corporations (PNP) owned and operated hatcheries.
- 11 State owned and PNP operated hatcheries.
- 2 State owned and operated hatcheries.
- 3 Federal or Bureau of Indian Affairs hatcheries.
- Streamside incubation projects.

An analysis of enhancement trends for each major region is presented.

Pink and chum salmon dominate the returns of the 5 species of salmon. In 2009, the enhancement program accounted for 59% of the chum, 21% of the pink, 15% of the coho, 16% of the Chinook, and 3% of the sockeye salmon in the statewide common property commercial harvest.

Prince William Sound: The enhancement program accounted for an estimated 84% of the salmon in the common property commercial harvest; 91% of the pink, 91% of the chum, 46% of the sockeye, and 7% of the coho salmon in the common property commercial harvest were hatchery produced. In addition, enhanced salmon contributed an estimated $26 million, or 62% of the value of the common property commercial harvest.

Southeast: The enhancement program accounted for 15% of the salmon in the common property commercial harvest; 88% of the chum, 23% of the Chinook, 19% of the coho, 7% of the sockeye and 2% of the pink salmon in the common property commercial harvest were enhanced. Additionally, enhanced salmon contributed an estimated $28 million or 34% of the value of salmon in the common property commercial harvest.

Kodiak: The enhancement program accounted for 25% of the salmon in the common property commercial harvest; 44% of the coho, 26% of the pink, 14% of the sockeye, 10% of the chum salmon in the common property commercial harvest were enhanced. Additionally, enhanced salmon contributed an estimated $7 million, or 21% of the value of salmon in the common property commercial harvest.

Cook Inlet: The enhancement program accounted for approximately 1% of the sockeye salmon in the common property commercial harvest, and contributed an estimated $185,000, or 1% of the value of salmon in the common property commercial harvest. Statewide, sport anglers harvested an estimated 259,640 hatchery-produced fish representing 8 species (Chinook, coho, pink, chum, and sockeye salmon; rainbow trout, arctic char and arctic grayling) http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf.

Appendix 4 (Table 1, Figure 1) provides a summary of projected adult returns, by species, to Alaska enhancement projects in 2010.

There are very well prescribed Statutes and laws for planning of hatchery developments. In particular, there is clear policy that ensures that hatcheries are placed in areas that causes least likely risk of mixing with existing wild stocks. Evaluation is based on documented environmental assessment. All hatchery release strategies are reviewed by ADFG and are ultimately under the authority of ADFG. Both economic and ecological evaluation of the release plan forms part of the decision making process. Introduction of genetic material is prohibited and hatchery stock is selected from the terminal area stock and hence, all genetic material originated from that location. Selection techniques are designed to avoid artificial reduction in genetic material – i.e. fish are selected at random and not on external trait basis (size etc). An extremely wide, pre-determined number of returning fish are used for stripping of ova for hatchery rearing and release (Reference to Genetic Policy, 1985).

There is evidence of denial of requests for permit alterations by hatchery corporations (See Permit Alteration Request Denial, Commissioner of Fish & Game letter to Prince William Sound Aquaculture Corporation, dated Sept 9, 2010). More information on the salmon hatchery releases topic is available in the conformance criteria no. 14 of this report.

The economic impact of salmon enhancement in Alaska is considerable. ADFG undertakes detailed economic analysis of the contribution that these activities generate. Examples of the information available are presented for the SE Alaska Private Nonprofit Aquaculture Associations and for the Prince William Sound Aquaculture Corporation in Appendix 4b.

3.9 Stock Assessments Methods and Practices

Salmon stocks have unique population dynamics characteristics in each river to which they return to spawn. That is, each "run" of salmon in a particular river must be understood, forecast, and managed as a discrete unit, not related to other runs of salmon in that river, or in nearby rivers.

In the years since Alaska became a state (1959), ADFG has compiled comprehensive databases on salmon runs. ADFG scientists use those data, plus in-season assessments of run strength (numbers of fish), to set escapement goals for the fisheries. "Escapement" means the annual estimated size of the spawning salmon stock, that is, the numbers of salmon that escape capture in a fishery. The quality of the escapement may be determined not only by numbers of spawners, but also by factors such as sex ratio, age composition, temporal entry from the ocean into the river system, and spatial distribution within salmon spawning habitat. The escapement goal is a stock-specific reference point for fishery management.

ADFG utilizes fishery performance data and associate information to make in-season evaluations of salmon harvests. Fish ticket data are used by the staff to evaluate in-season run strength, attribute catches to various streams, evaluate enhancement projects, measure long-term production, establish and modify escapement goals, and generate forecasts.

In-season assessments of run strength from spawning escapement information can also be obtained from:

- aerial surveys of terminal areas and streams,
- fishery performance data Catch per Unit effort (CPUE),
- tagging studies,
- radio-telemetry,
- counting towers,
- weir counts periodic,
- catch sampling and monitoring efforts and
- sonar abundance estimates.

ADFG also charters vessels to conduct test fishing assessments of run strength in selected index areas and monitors salmon sex ratios in the commercial harvest to evaluate run timing.

Age composition of commercial salmon catches are monitored to determine the strength of age classes in the run. Aerial survey data are utilized to: (1) evaluate initial run strength while salmon are travelling to the spawning grounds, and (2) document peak salmon abundance on the spawning grounds as an index to total escapement.

Alaska salmon fisheries are augmented in certain areas by hatchery releases. All commercial harvests of these enhanced salmon are performed by the CPF. The natural salmon contributions to the CPF are estimated by subtracting hatchery contributions from the CPF total. Recoveries from hatchery contributions are determined by the use of a number of marks to aid identification

including; thermal marked otolith recoveries, coded wire tag recoveries, or average fry-to-adult survival estimates multiplied by fry release numbers and estimated exploitation rates. All Alaska salmon hatcheries are non-profit corporations which perform “ocean ranching”. By law, salmon farming, growing salmon (or any other finfish) to market size in captivity is illegal in Alaska.

Other ecosystem investigations include;

- limnological investigations of numerous lakes throughout the drainage to assess production potential,
- fry and smolt population estimates,
- evaluation of the effects of northern pike (*Esox lucius*) predation and beaver dams on production and studies of salmon fisheries to determine the river of origin of all harvested fish.

For some stocks, there are little or no stock-specific data on escapements or catches, so ADFG selects a watershed model or a stream-length model on which to base its estimates of run strength and escapement. Where there are little stock-specific data, ADFG uses a paleolimnology model for sockeye salmon, or a model relating spawning abundance to system production, for species such as Chinook salmon. This leads to the development of a Sustainable Escapement Goal (SEG). A sustainable escapement goal is an estimate based on historical performance and other factors known to conserve stock over a five to ten year period.

Escapement Goals

Most of the salmon assessments are described relative to a **Sustainable Escapement Goal (SEG)** for an index area. An SEG is a level of escapement, indicated by an index or an escapement estimate that is known to provide for sustained yield over a 5 to 10 year period. It is developed from the best available scientific information. The SEG is determined by ADFG, and is stated as a range that takes into account data uncertainty. SEG is used in situations where a Biological Escapement Goal (BEG) cannot be estimated because of the absence of a stock-specific catch estimate.

The SEG is the primary management objective for the escapement, unless an **Optimal Escapement Goal (OEG)** or in-river run goal has been adopted. An optimum escapement goal allows for sustainable runs based on biological needs of the stock and ensures healthy returns for commercial, sport, subsistence, cost-recovery, and personal use harvests. Optimum escapement goals are set by the BoF.

For stocks where there are many data on both escapements and catches, it is possible to calculate a **Biological Escapement Goal (BEG)**. BEG takes into account stock-recruit data, and fishing power. A BEG is the escapement that provides the greatest potential for maximum sustained yield. BEG is the primary management objective for escapement unless an optimal escapement or in-river run goal has been adopted. It is developed from the best available biological information. The BEG is determined by ADFG, and is expressed as a range based on factors such as salmon stock productivity and data uncertainty. ADFG seeks to maintain evenly distributed salmon escapements within the bounds of the BEG.

SEGs and BEGs can be thought of as stock-specific target reference points for salmon stocks. There is also a **Sustained Escapement Threshold (SET)**, which is the threshold level of escapement, below which the ability of a salmon stock to sustain itself is jeopardized. In practice, the SET is estimated based on the lower ranges of historical escapement levels, for which the salmon stock has consistently demonstrated the ability to sustain itself. The SET is set lower than the lower bound of the BEG and SEG. The SET is established by ADFG, for salmon stocks of management or conservation concern. In other words, the SET is a stock-specific limit reference point.

Regression and median estimates, simple linear regression models, multiple regression models and generalized Ricker models are used for the forecasts.

Source: http://sustainability.alaskaseafood.org/wp-ontent/uploads/SustainabilityWhitePaper.pdf **.**

During the on-site verification stage of the assessment, assessors attended the BoF meeting of the Lower Cook Inlet, November 15th -19th 2010 (refer to section 5). At this meeting, the assessors were able to witness examples of the management decision making process with respect to the proposals for use of SEG's for specific river systems. While this BoF meeting was specific to only one region of Alaska (Central Region 2, Lower Cook Inlet), it represents a true and accurate representation of the management system that is used at all BoF cycle of meetings. A general description of the BoF is provided in Section 3.3.

The management system for Alaska salmon is based upon a 'Sustained Yield' policy that is consistent with the US Magnuson Stevens Act (names after the late Senator Ted Stevens) and State polices for the management of natural, fishery resources. ADFG area and regional staff gather and analyze scientific and fishery data, and formulate goals and objectives for each major fishery, subject to the directives of the BoF. These goals and objectives are presented annually in Commercial Fisheries Division's Annual Management Plans, Annual Management Reports, and similar documents. The mechanism for meeting sustainable yield for each fishery is based on setting a BEG's or SEG's where less, specific data for a single inriver run exists. However, where SEG's are used, the management approach can be described as precautionary and appropriate. Area level commercial salmon managers have transparent authority to open and close fisheries based upon the information available to them at the time and within the context of pre-determined fishery management plans. This provides fishery managers with the most current information from stock assessment projects and from the fishing grounds with the objective of enabling quick decisions to be made amid the rapidly changing salmon returns allowing access to the fishery without long-term compromise of stocks. Decisions are then brought into effect through ADFG's Emergency Orders, which is the legal mechanism of in-season management.

The in-season management process is important aspect of the Alaska salmon management system that provides controlled fishing opportunities without long-term, irreversible impact on the 5 species of Alaska salmon. At both the regional and area level, fishery managers are supported by research staff engaged in various activities, most prominently, salmon return and run estimation. (http://www.sf.adfg.state.ak.us/FedAidPDFs/sp10-02.pdf).

4. Proposed Assessment Units

The Assessment Units are investigated during the initial assessment and validation stages. The Assessment Plan should ensure that Assessment Units have been sufficiently addressed in the full Assessment Report to allow conformance of the fishery management to be evaluated.

Unit of Certification				
Proposed Unit of Certification	**US ALASKA SALMON FISHERIES**			
	Fish Species (Common & Scientific Name)	**Geographical Location of Fishery**	**Gear Type**	**Principal Management Authority**
1.	**King/Chinook *(Oncorhynchus tschawytscha)* Sockeye/Red *(Oncorhynchus nerka)* Coho/Silver *(Oncorhynchus kisutch)* Pink/Humpback *(Oncorhynchus gorbuscha)* Keta/Chum *(Oncorhynchus keta)***	**ADFG Admin Region 1: Southeast & Yakutat**	**Troll, Purse Seine, Drift Gillnet, Set Gillnet**	**ADFG**
2.	**King/Chinook *(Oncorhynchus tschawytscha)* Sockeye/Red *(Oncorhynchus nerka)* Coho/Silver *(Oncorhynchus kisutch)* Pink/Humpback *(Oncorhynchus gorbuscha)* Keta/Chum *(Oncorhynchus keta)***	**ADFG Admin Region 2: Central**	**Purse Seine, Drift Gillnet, Set Gillnet**	**ADFG**
3.	**King/Chinook *(Oncorhynchus tschawytscha)* Sockeye/Red *(Oncorhynchus nerka)* Coho/Silver *(Oncorhynchus kisutch)* Pink/Humpback *(Oncorhynchus gorbuscha)* Keta/Chum *(Oncorhynchus keta)***	**ADFG Admin Region 3: Arctic-Yukon-Kuskokwim**	**Drift Gillnet, Set Gillnet Fish wheel.**	**ADFG**
4.	**King/Chinook *(Oncorhynchus tschawytscha)* Sockeye/Red *(Oncorhynchus nerka)* Coho/Silver *(Oncorhynchus kisutch)* Pink/Humpback *(Oncorhynchus gorbuscha)* Keta/Chum *(Oncorhynchus keta)***	**ADFG Admin Region 4:Kodiak, Chignik, Alaska Peninsula, Aleutian Islands**	**Purse Seine, Drift Gillnet, Set Gillnet**	**ADFG**

5. Consultation Meetings

5.1 Initial Consultation Meetings

Initial consultation meetings were held in late June and early July 2010. The objectives of the consultation meetings were to provide information and understanding of the activities of the Certification Body and to discuss each of the fishery management organizational roles in the management of Alaska state salmon resources. Further investigation into the approach that a full assessment might undertake with respect to the current definition of the Unit of Certification and the Assessment Units that are proposed was also undertaken during this stage of the assessment.

Further consultation meetings were planned during the main assessment step based on the Validation work finalized in October and the initial review activities undertaken to identify the key management organizations and participants. The initial consultation meetings were not designed to be inclusive of all organizations and representatives of the Alaska salmon fisheries. However, the consultation plan was designed to strategically capture sufficient information to ensure understanding and confidence with respect to full assessment planning.

There were other important functions that the on-site consultation also served. These included:

- Responding to questions and comments raised by participants in the fishery at this initial stage in the assessment.

A summary of items included in the standard approach to each meeting were as follows:

- Introduction to the Certifying Body.
- Overview and confirmation of the assessment overview and plan (a standard power point presentation was used, also made available on ASMI website for all participants to review).
- General discussion on the specifics of the particular meeting:
    - Units of Certification and Units of Assessment.
    - Initial site visit objectives and investigative approach.
    - Address any immediate questions raised by management and participatory organizations.
    - Document information that would form part of the full assessment.

All consultation meetings were conducted by Dave Garforth, Assessment Manager, and Stephen Grabacki, contracted Fishery Assessor. Randy Rice, ASMI Seafood Technical Program Director was also present at some meetings as representative of the fishery applicant representative organization ‘ASMI’.

Overview of Meeting Plan:

Meetings were held between the 21st June to 2nd July 2010, in Anchorage, Seward, Juneau, and Seattle, WA. The visit also included an aerial tour of Upper Cook Inlet to provide an overview of the salmon gill net fishery, and a boat tour of the Juneau-based salmon drift net fishery, to witness the scale of fishery activities and observe fishing operations, directly. The consultation plan included a total of 19 meetings/tours held over the period.

Key Outcome of the Consultation Meetings:

Each meeting served as the primary purpose to introduce the Certification Body, Global Trust and provide an overview of the FAO assessment approach and process. Key timelines for assessments and the specifics of the proposed assessment and certification units were presented. Immediate questions and concerns expressed by management and participatory organizations were addressed and some key areas which will form part of the full assessment were also addressed. Consultation meetings are intended to provide a briefing of the certification process and link to management organizations for the purposes of carrying out the fishery assessments and to support the next step in the assessment, the planning of full assessments for the fisheries in application.

A list of organizations consulted at the initial step in the assessment is presented in table 5.

Table 5. Summary of Consultation Meetings.

Date	Organization	Staff Represented	Overview/Key Items
21st June 2010	**Icicle Seafoods Inc.** 601 Port Av. Seward, AK 99664	Charles McEldowney, Plant Manager	Icicle Seafoods Inc. is an integrated fisher/processor of salmon (processor) and ground fish (vessel owner and processor). The meeting reviewed the operational management, sourcing and requirements for official reporting/recording of catches at landing and at processing. Review and understanding of fish landing recording and reporting procedure for Alaska salmon and ground fish fisheries (halibut, sablefish). The meeting supported the understanding of catch recording and reporting requirements for salmon and groundfish fisheries and provided an overview of processing operations, fish yield calculation and product traceability for these fish products.
22nd June 2010	**North Pacific Fishery Management Council,** 605 West 4th Av. #306 Anchorage, AK 99501-2252	Chris Oliver, Executive Director David Witherell, Deputy Director Jane Dicosimo, Senior Plan Coordinator	The NPFMC has primary responsibility for groundfish management in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI), including cod, pollock, flatfish, Atka mackerel, sablefish, and rockfish species harvested mainly by trawlers, longliners, and pot fishermen. The Council also makes allocation and Individual Fishing Quota decisions for halibut and interacts closely with the U.S. - Canada International Pacific Halibut Commission (IPHC), which is responsible for conservation of halibut fisheries. Other large Alaska fisheries such as salmon, are managed primarily by the state of Alaska, again with interaction with the Council and hence they form part of the overall management framework and are included for assessment purposes NPFMC is not directly involved in the management of Alaska state salmon resource. However, salmon catches may form part of the by-catch of fisheries that are managed by the Council and the Council is a primary management stakeholder in all Alaska state fisheries. Established by the Magnuson Fishery Conservation and Management Act in 1976 (now renamed the Magnuson-Stevens Fishery Conservation and Management Act) to oversee

			management of the nation's fisheries, the meeting supported the understanding of the role, responsibilities and interaction of the Council with other management organizations in the fisheries and also Alaska salmon fisheries where there may be interaction at the fishery level through by-catches.
24th June 2010	**Aerial tour over Upper Cook Inlet**	Trail Ridge Air Service	The aerial tour of Upper Cook Inlet took a course from Anchorage south over Turnagain Arm to the Kenai River, Kasilof River and then across to the western shoreline and then north over Susitna River on the return leg. Set gill net and drift gill net fishing activity was observed (although light as this was early in the season). Summary of items reviewed: Gill net dimensions, setting strategy and fishing pattern was reviewed and general scale of operations for management and monitoring and control purposes of ADFG and the Alaska Wildlife Troopers (AWT).
27th June 2010	**At-sea Processors Assn.** 217, 2nd St. #201A Juneau AK 99801	Stephanie Madsen, Executive Director	The At-sea Processors Association (APA) is a trade association representing five companies that own and operate 19 U.S.-flag catcher/processor vessels that participate principally in the Alaska pollock fishery and west coast (USA) Pacific whiting fishery. Members include; American Seafood Company, Arctic Storm Management Group, Glacier Fish Co, Starbound LLC and Trident Seafoods. Although APA is not directly involved in salmon fishing, members may operate across a range of species and fisheries, including salmon processing, hence have been included in consultation meetings.
27th June 2010	**Boat tour of Taku Inlet**	Taku Fishery, Juneau. Boat charter: Dick Farnell, Juneau, Alaska. Jev Shelton, Juneau, Alaska on board of F/V Kirsten Anna in the District 11 Southeast Drift Gillnet Fishery	The tour commenced south from Juneau down the Taku Inlet to witness fishing activity of the District 11 Drift Gillnet Fishery. Drift Gillnetters were seen operating as per the requirement, within the fishery boundary and the assessors were invited aboard Jev Shelton's F/V Kirsten Anna to discuss aspects of the day to day fishery operations, catch recording and reporting activities, information gathering and interaction with management organizations. Assessors took the opportunity to witness deployment of gear and fish handling practices.

28th June 2010	**United Fishermen of Alaska**, 211 4TH St. Suite 110 Juneau AK 99801-1172 (meeting took place at ASMI Juneau office)	Mark Vinsel, Executive Director	United Fishermen of Alaska (UFA) is an umbrella association representing 37 Alaska commercial fishing organizations from fisheries throughout Alaska and its offshore waters. Their mission is to promote and protect the common interest of Alaska's commercial fishing industry, as a vital component of Alaska's social and economic well-being. Core functions include; providing a legislative presence for members, act as a forum for communication within the fishing industry, maintain a state wide trade organization with staffed office and provide public relations and educational programs on behalf of members.
28th June 2010	**Commercial Fisheries Entry Commission**, 8800 Glacier Hwy, #109 PO Box 110302 Juneau AK 99811-0302	Frank Homan, Chairman, Peter Froehlich, Commissioner, Bruce Twomley, Commissioner, Doug Rickey, Law Specialist; Kurt Iverson, Fisheries Analyst	The Commercial Fisheries Entry Commission (CFEC) is the state body responsible for the allocation of permits and vessel licenses for entry to Alaska fisheries. Established in 1973 in response to declining salmon harvests, the CFEC determines when a fishery should be limited and also provides due process hearings and appeals. To date, 65 fisheries have limited entry permits in Alaska. Some key features of the Limited Entry Program include; issuance to natural persons only, prohibiting permit leasing, prevent the use of permits as collateral for loans, and allowing for free transferability. The Limited Entry law also defined entry permits as a use-privilege that can be modified by the legislature without compensation. Free transferability has resulted in maintaining high percentages of residents within Alaska's fisheries and has been upheld by Alaska's Supreme Court. Permit holders are free to transfer their permits to family members or any other individual who is able to participate in the fishery by means of gift, inheritance or sale.
28th June 2010	**Alaska Department of Public Safety, Division of Alaska Wildlife Troopers**, 2760 Sherwood Lane, Suite 1A PO Box 111201, Juneau AK 99811-1201	Lt. Steven Hall	AWT is a Division of the Alaska Department of Public Safety with responsibility for the protection of Alaska fisheries within state waters and extending throughout the freshwater range of anadramous species, including salmon. The Division's resources and strategy for monitoring fishery activity and enforcement purposes and interaction with other agencies (ADFG, NMFS, US Coast Guard, and BoF) were discussed.
28th June	**U.S. Department of Commerce, National**	Robert Mecum, Deputy Regional	NOAA National Marine Fisheries Service (NMFS, also called NOAA Fisheries) is responsible for the management, conservation, and protection of living marine resources within the

2010	**Oceanic & Atmospheric Administration, National Marine Fisheries Service**, Alaska Region PO Box 21668 709 W 9th St Juneau AK 99802-1668	Administrator, Alaska Region.	U.S. Exclusive Economic Zone. The Alaska Region of NOAA Fisheries oversees fisheries that produce about half the fish caught in US waters, with responsibilities covering 842,000 square nautical miles off Alaska. NMFS works with the fishery management councils and commissions to develop and implement management regulations and also for the conservation of wildlife such as marine mammals and habitat conservation. The meeting provided an opportunity to discuss the assessment approach and outline the various steps in the assessment process.
28th June 2010	Alaska Department of Fish and Game, Division of Commercial Fisheries PO Box 115526 1255 W 8th St. Juneau AK 99811-5526	Eric Volk, Chief of Research for Anadromous Fisheries Sue Aspelund, Deputy Director Denby Lloyd, Commissioner (present for introductions)	ADFG's mission is to protect, maintain, and improve the fish, game, and aquatic plant resources of the state, and manage their use and development in the best interest of the economy and the well-being of the people of the state, consistent with the sustained yield principle. Their main role is to conserve and develop the fishery resources of the state. This involves setting seasons, catch limits, management methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The BoF is charged with making allocative decisions, and ADFG is responsible for management based on those decisions. The meeting provided an opportunity to present the key features of the assessment process, discuss the broad mission and responsibility of ADFG and address questions with respect to the assessment timelines and plan for Alaska salmon fisheries.
29th June 2010	**U.S. Department of Homeland Security,**	Cpt. Michael Cerne	The United States Coast Guard is a military, multi-mission, maritime service within the Department of Homeland Security. Its core roles are to protect the public, the environment, and U.S. economic and security interests in any maritime region in which

	Coast Guard, District 17 P.O Box 25517, Juneau, Alaska 99802-5517		those interests may be at risk, including international waters and America's coasts, ports, and inland waterways. They protect America's maritime borders from all intrusions by: preventing illegal fishing; and suppressing violations of federal law in the maritime arena. The US Coast Guard is responsible for fishery law enforcement beyond the 3 mile zone. Operations are combined with both State and other federal resources. The US Coast Guard shares intelligence and seacraft (often include AWT staff) with the other agencies involved in MCS (Monitoring, Control and Surveillance), including NMFS and ADFG. The US Coast Guard also attends the fishery conferences and meetings of the principal managem**e**nt agencies, ADFG, NPFMC and IPHC where understanding and contribution through advice on the practical implementation of management proposals and regulations can be transferred to support effective enforcement-based activities. During the visit, attendance at the daily, morning briefing for staff and a visit to the surveillance control center also took place, as well as discussions on US Coast Guard responsibilities for the 5 year strategic fishery plan and resources for monitoring, control and enforcement.
30th June 2010	**Douglas Island Pink and Chum, Inc., (DIPAC)** 2697 Channel Dr., Juneau AK 99801	Eric Prestegard, Executive Director & Rick Focht, Director of Operations	The stated goal of Douglas Island Pink and Chum, Inc.(DIPAC) is to sustain and enhance valuable salmon resources of the State of Alaska for the economic, social, and cultural benefit of all citizens, and to promote public understanding of Alaska's salmon resources and salmon fisheries through research, education, and tourism. Private non-profit (PNP) salmon hatcheries for the purpose of enhancing the state's CPF commenced in 1974. PNP hatcheries refer to a unique program that allows private non-profit corporations to own and operate salmon hatcheries for improving the harvests of salmon. DIPAC was formed in 1976 responding to this legislation and our community's depleted fisheries resource. After significant returns and a positive contribution to local fisheries, the Macaulay Salmon Hatchery project was considered. Most recently, in July 1996, DIPAC took over the operations of the Snettisham Hatchery located 30 miles south of Juneau.

			DIPAC operates as a business through a cost recovery program whereby State permits allow PNP hatcheries to harvest a certain portion of the returning fish to generate revenue to cover operational costs. DIPAC's goal is to contribute 60% of its production to the CPF and 40% of production to the cost recovery harvest. Discussions centered upon the background and significance of PNP salmon enhancement activities to the overall economic development of Alaska salmon fisheries; enhancement programs for chum, Chinook, coho and sockeye, operational management practices at the hatchery, methods and use of thermal marking of fish, policies toward genetic integrity and conservation of salmon stocks. DIPAC, like all other Alaska salmon hatcheries, functions only as a "rancher", the hatchery releases the juvenile fish to the ocean, where they live and feed naturally. Then they are subject to the common-property commercial fishery upon their return to Alaska.
2nd July 2010	**U.S. Department of Commerce, National Oceanic & Atmospheric Administration, National Marine Fisheries Service,** Alaska Fishery Science Center 7600 Sand Point Way NE Seattle WA 98115	Dr. Bill Karp, Deputy Director for Science and Research	The Alaska Fisheries Science Center is the research branch of the National Oceanic and Atmospheric Administration's NMFS responsible for research on living marine resources in the coastal oceans off Alaska and off parts of the west coast of the United States. The mission of the Alaska Fisheries Science Center is to generate the scientific information and analysis necessary for the conservation, management, and utilization of the region's living marine resources. The Center provides scientific data and analysis and technical advice to the NMFS Alaska Regional Office, North Pacific Fishery Management Council, state of Alaska, Alaskan coastal subsistence communities, and U.S. representatives participating in international fishery and marine mammal negotiations and to the fishing industry and its constituents. The Center also coordinates fisheries habitat and marine mammal research, with other Federal and state agencies, academic institutions, and foreign nations. Among other items, fishery stock surveys and assessments, observer programs, Guidelines for Fishery Management Plans and Stock Assessment and Fishery Evaluation (SAFE) reports.
2nd July 2010	**Trident Seafoods Corp**. 5303 Shilshole	Joe Logan, Corporate QA	Trident Seafoods is a vertically integrated harvester, processor and marketer of seafood from Alaska, the Pacific Northwest and around the world. Founded in 1973, they are a privately held, American owned corporation operating offshore processors and shore-side

	Ave NW Seattle, WA 98107-4000		plants throughout Alaska and the Pacific Northwest. The Trident trawl catcher processor fleet is comprised of 3 vessels ranging in size from 270 to 300 ft. These vessels operate in the Bering Sea, Aleutian Islands, Washington and Oregon with the majority of the harvesting operations taking place in the Bering Sea with the primary target species for these vessels being Pollock and Pacific Whiting which are targeted in the spring and fall. Discussions centered upon assessment approach and requirements for both fisheries and supply chains (Chain of Custody).
2nd July 2010	**ADFG** 1255 W 8th St. Juneau AK 99801-5526 ASMI office Seattle	David Bedford, Deputy Commissioner	ADFG's mission is to protect, maintain, and improve the fish, game, and aquatic plant resources of the state, and manage their use and development in the best interest of the economy and the well-being of the people of the state, consistent with the sustained yield principle. In addition to discussions on the role of the BoF, ADFG's Sustainable salmon Policy, the meeting gave an opportunity to discuss the key elements, metrics and approach of the FAO based assessment. Discussion items included the review process, information access and the role of the Assessment Team of the Certification Body.
2nd July 2010	**Pacific Seafood Processors Association** 199 W. Emerson Place Suite 205 Seattle WA 98119	Glenn Reed, President	The Pacific Seafood Processors Association (PSPA) is a non-profit trade organization established in 1914 to address issues of concern to member seafood companies including both at sea processors and shore based processors. Current Corporate members include: Alaska General Seafoods, Alyeska Seafoods, Inc., Golden Alaska Seafoods, LLC, North Pacific Seafoods, Inc., Peter Pan Seafoods, Inc., Phoenix Processor Limited Partnership, Trident Seafoods, Inc. and UniSea Inc., Westward Seafoods, Inc. PSPA members produce and market products from salmon, crab, halibut, cod, pollock and a variety of other seafood species. These products are marketed domestically and around the globe. Key points of discussion focused on the assessment approach, the definition of non conformances and the merits of eco-labeling in the supply chain.

5.2 On-Site Witnessed Assessment and Consultation Meetings

On-site visits took place from November 15th-19th and from Dec 1st-3rd and 6th-9th 2010. These were additional visits to the initial consultation meetings reported in section 5.1. There were two types of on-site assessment activities; meetings with fishery management organizations, and witnessed assessment, which took the form of witnessing specific management processes and functions.

The schedule of on-site activities is provided in table 5.2 with a summary of the activity, meeting and outcome. Meetings were used to document information that supported, clarified and substantiated the assessment and also gave an opportunity to organizations to contribute with information they felt important to support the assessment.

A key feature of the FAO-Based RFM assessment approach is to witness the management activities and procedures *in situ*. Therefore, members of the Assessment Team attended the Nov 15th-19th 2010 BoF meeting cycle for Lower Cook Inlet held in Homer, Alaska. The meeting took place over a period of 4 days. Three days of the meeting were attended by assessors. The purpose of the meeting was to 'witness' the proceedings in order to verify if management functioned in accordance with the policies, procedures and legislature that defines Alaska salmon fisheries management. Features of the proceedings of the meeting are presented in table 5.1. By way of introduction to the BoF and attendees, the Assessment Team gave a brief presentation of the FAO-Based RFM Certification and overview of the Alaska salmon assessment to date.

Members of the Assessment Team also attended part of the NPFMC December 6th -14th 2010 cycle of meetings held in Anchorage and a summary of key proceedings that were witnessed is also provided in summary in table 5.1.

A considerable number of fishery representatives were met and consulted with during an ASMI annual stakeholder meeting held Dec 1st to 3rd 2010, in Seattle, Washington. An up-date on the Alaska salmon assessment was presented to the members of the ASMI Technical and Salmon Species Committees, as well as ASMI's Board of Directors. The two-way exchange allowed an opportunity for fishery participants to ask questions and contribute information with respect to the assessment process. One focus of this exchange centered upon the chain of custody of fish from vessel to shore and onwards into the supply chain and market. Identification of the first point in the chain is an important feature of the assessment, which establishes the starting point for further down line chain of custody handlers.

Table 5.1. Site Visit Schedule and Summary Outcomes for Alaska Salmon.

Date	Meeting/event or activity/Present	Summary Outcome
Nov 15th 2010	**ADFG, Soldotna, Alaska Office** Upper Cook Inlet Area Manager: Jeff Fox Global Trust: Dave Garforth, Steve Grabacki	A general discussion on the performance of salmon stocks in the Upper (northern) Cook Inlet region. Discussion also focused on some of the current challenges in the Cook Inlet river systems to salmon predation caused by Northern Pike. Northern Pike are native to certain regions of Alaska, but have been introduced into some non-native river systems and lakes where the ecology may result in high predation of species such as salmon and trout. Eradication programs had been implemented in a number of cases and the potential management options in this particular situation were under review. There are other situations where Northern Pike may have impact on freshwater salmonid populations. ADFG reports in this regard are published periodically. There are a number of directed sports fisheries for Northern Pike throughout Alaska, and documented proposals are presented and carried by the BoF on increasing fishing opportunities for the species as a controlling mechanism for the population and where evidence demonstrates that eradication is critical to the survival of salmon via measures such as the use of rotenone. Before such measures are taken, an environmental assessment on the risks and potential ecological impacts to the system is undertaken http://www.adfg.alaska.gov/index.cfm?adfg=nonnativespecies.main and http://www.sf.adfg.state.ak.us/Static/invasive_species/PDFs/CheneyLakeEA.pdf . Regulations in Alaska prohibit the introduction of fish species into any river or saltwater system without permit. ADFG has also developed an overall invasive species management plan for Northern Pike http://www.sf.adfg.state.ak.us/Static/invasive_species/PDFs/pike_management_plan.pdf.
Tue 30th Nov 2010 Seattle	**ASMI Seafood Technical Committee meeting:** Global Trust: Dave Garforth, Steve Grabacki	A presentation was provided to the ASMI Seafood Technical Committee on the certification program and on the current progression of the salmon fishery assessment. Discussion with respect to the stages in the assessment process undertaken and remaining steps and on the chain of custody for Alaska salmon was held.

Fri 3rd Dec 2010	**NMFS Alaska Fisheries Science Center, Seattle, Washington,** William Karp, Loh-Lee Low Global Trust: Dave Garforth, Steve Grabacki	A number of areas specific to the Alaska salmon assessment were discussed including; - Chinook salmon by-catch in the Bering Sea and Gulf of Alaska trawl fisheries (refer to PFMC Meeting Dec 6th-8th for further details of the issue). - In connection with the above; improvements in the observer programs for Bering Sea and Gulf of Alaska trawl fisheries specific to by-catch of salmon. The current observer program In the GOA does not require under 60ft vessels to be observed and under 125ft vessels have an observer onboard for 30% of the time. Vessels above 125ft are required to have an observer onboard 100% of the time. New requirements for increased observer coverage are currently in progression through the NPFMC process for eventual implementation through federal regulations. - The Genetic stock identification program (national and international) - The North Pacific Anadramous Fish Commission (NPAFC)- The Bering-Aleutian Salmon International Survey (BASIS)
Mon 6th Dec 2010	**NPFMC, Anchorage, Alaska** Chris Oliver, David Witherell Global Trust: Dave Garforth, Steve Grabacki	A short meeting covering a number of aspects of Alaska fisheries management. Areas pertinent to the Alaska salmon assessment included the proposals for amendment to the federal salmon fisheries management plan and bycatch of Chinook salmon in Gulf of Alaska groundfish fisheries. These items were subject to additional assessment review during the council meeting sessions of the 6th-8th December. See below on page 63.
Thurs 9th Dec 2010	**ADFG, Commercial Fisheries Division, Anchorage Office** Jeff Regnart, Tracy Lingnau, Dan Gray Global Trust: Dave Garforth, Steve Grabacki.	A meeting with ADFG Commercial Division managers and biologists was held at the Anchorage office. Items included in discussion: • ADFG Salmon escapement goal and fishery management plan review processes • The escapement goal development team • Hatchery and wild fish management strategies and potential interactions 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.

		A number of references were provided on latest information on hatchery and wild fish interactions. Of note, were papers presented at ecological interactions between wild & hatchery salmon, May 4-7 2010, Oregon http://www.stateofthesalmon.org/conference2010/presentations.html. There is considerable range and detail in the scientific information presented and research with respect to interactions of hatchery and wild salmon stocks. Papers noted were R. Brenner, May 2010 and An Overview of Salmon Stock Enhancement in Southeast Alaska By William R. Heard NOAA/NMFS/ Alaska Fisheries Science Center, Auke Bay Laboratories. The key concerns discussed included: genetic interaction of hatchery and wild salmon, the process of setting enhanced fishery release numbers and the potential for counting strays of hatchery releases in the returning runs of wild salmon. Discussions presented by the ADFG provided support and additional clarification on sourcing information specific to these items. The summary of evidence evaluated for these issues is included in Section F of the Assessment Report (refer to Section 7).
Nov 15-19th 2010	**WITNESSED BOARD OF FISHERIES MEETING:** **BoF Meeting, Homer, Alaska, regarding Lower Cook Inlet** Alaska BoF Members. Karl Johnstone, Bill Brown, Mike Smith, John Jensen, Mel Morris, Vince Webster, Tom Kluberton. Jim Marcotte, Executive Director. An open forum of	Short meeting with the Executive Director of the BoF, Jim Marcotte: Explanation of the certification program and exchange of the BoFs' role and process (and introduction to BoF members). A presentation provided by BoF on the BoF process. Witnessing of a series of proposals presented to the BoF on Alaska salmon (and other fisheries) within the Lower Cook Inlet fishery jurisdiction. A summary outcome of all proposals read at this session can be reviewed (as with all previous BoF outcomes) at: http://www.boards.adfg.state.ak.us/fishinfo/meetsum/2010-2011/prelim-list-actions-lci.pdf. **Outcome of witnessed BoF meeting:** The BoF process can be confirmed an effective and transparent management process for allocative decision and regulatory amendments. The BoF's cycle of meetings results in a routine review Alaska salmon fisheries with respect to addressing the issues presented for each fishery stock that is exploited either by commercial, sports, subsistence or personal use. Through the 15—18th November meeting a number of items were presented as formal proposals by individuals or groups ranging from increasing or decreasing bag limits, to modification of harvest seasons, changes to the delineation of fishing areas at the entrance to rivers, modifications to SEG's from thresholds to ranges and proposals for new fisheries (in this instance a sports bow and arrow fishery) were presented for review and decisions by the BoF. The decision process allows the BoF to chose from a number of determinations - carry as amended, fail, take no action, table or table as amended. Of importance and witnessed, the BoF process

	managers, fishery participants and stakeholders, public interests in the Alaska salmon (and other fisheries). Global Trust: Dave Garforth, Steve Grabacki	essentially makes adjustments to fishery measures through regulations that relate to the allocation of fishing opportunities to the various user groups. Essentially, the BoF cannot make decisions that negatively affect the biological conservation of stocks but can make allocative decisions on the use of harvestable runs of salmon. **Examples of Proposals witnessed by the Assessment Team:** **Lower Cook Inlet Freshwater - Salmon** A number of Agenda Items included proposals relevant to the Anchor River within Lower Cook Inlet**.** Agenda Item 22**: Change the Anchor River escapement goal from a threshold to a range.** Outcome – No Action taken by BoF. The proposal would see the Anchor River Escapement Goal Policy managed for a range within either a BEG or SEG. The Chinook salmon escapement goal policy on the Anchor River is currently managed as a Lower Bound (LB) SEG Threshold. The proposers believed that a range would be better suited for in-season management and provide an upper end that would protect against escapements that are beyond the replacement point. Better data through aerial survey information and weir data since 2003 was described. The proposers noted that Anchor River fishing effort is increasing (Sports) since stocking programs were reduced on the Kasilof and Ninilchik and rivers, and it was vital to manage for future returns for MSY. Deliberations focused on the potential of lost opportunity on runs when the runs exceed carrying capacity. The submission was proposed by Kenai Area Fisherman's Coalition. ADFG presented the current status of the stock in a paper 'A Review of Escapement Goals for Salmon Stocks in Lower Cook Inlet, Alaska, 2010'. Otis; E. O.; N. J. Szarzi; L. F. Fair; and J. W. Erickson http://www.boards.adfg.state.ak.us/fishinfo/meetinfo/2010_2011/LCI/staff-reports.pdf. A review was carried out by ADFG interdivisional escapement goal review committee [Pacific Salmon escapement goals for major river systems in Lower Cook Inlet (LCI)]. Except for 2 Chinook salmon stocks (Anchor and Ninilchik rivers) and 5 sockeye salmon stocks, salmon escapements in LCI are primarily monitored by single or multiple aerial and/or foot surveys of stream reaches that can be monitored. The report describes that the resultant escapement indices do not provide absolute abundance estimates suitable for estimating biological escapement goals for each of the 3 Chinook, 12 chum, 21 pink and 8 sockeye salmon stocks. Monitoring has shown that escapement performance for chum, pink and sockeye salmon relative to these new goals has been good during the past 4 years, with harvestable surpluses available in 77-88% of streams most years. Based on additional years of escapement and

		harvest data, ADFG recommended changing the Anchor River Chinook salmon goal from a lower bound SEG of 5,000 to an SEG range of 3,800 to 10,000 fish. Other recommendations were made for stocks which are now monitored by weir and video projects. In 2001, with the definitions of escapement goals adopted into policy by the BoF and the uncertainties in estimating and stock-specific commercial harvests, ADFG changed all LCI goals to sustainable escapement goals (Otis 2001). The escapements from 2008 to 2010 to the Anchor River were significantly lower than the average annual escapement of 10,435 from 2004 to 2007. A full probability spawner-recruit model had been up-dated with escapement and harvest data through 2009. The recommended lower bound of the SEG of 3,800 is the point estimate (posterior median) of S_{msy} from the full probability model, including this recent data. The upper bound is the point estimate of carrying capacity, 10,000 from the up-dated model. And the case presented by ADFG is that the SEG range of 3,800-10,000 minimizes the risk of overfishing which would allow liberalization of the harvest when escapement is large. Continued collection and analysis of data for Anchor River Chinook salmon was advised because empirical production data is not available, particularly from escapements at or near the estimate of S_{msy} for this stock. Through discussion by the BoF and cross examination, state legal advisors were consulted to seek clarification on the BoF's authority at approving BEG/SEGs. The BoF has authority to approve OEGs, but BEGs/SEGs based on the conservation of stocks, are set by ADFG. Discussion centered upon concerns that insufficient data currently existed to determine a range and that, given the previous 2 year history of below average runs, it was felt more conservative to leave the escapement goal at the current 5,000 and not reduce the lower end to 3,800. The outcome of this proposal was that 'No Action' was taken by the BoF.
Mon 6th-8th Dec 2010	**WITNESSED COUNCIL MEETING:** **NPFMC Meeting** 201st Plenary Session North Pacific	Members of the Assessment Team attended the NPFMC meeting in Anchorage, from dates including 6th-8th December 2010 http://www.alaskafisheries.noaa.gov/npfmc/Agendas/1210Agenda.pdf. A guide to the NPFMC organization and decision making processes was reviewed and is available at http://www.fakr.noaa.gov/npfmc/misc_pub/Navigating_NPFMC.pdf. The Council meeting process consists of three major meetings. The Scientific and Statistical Committee (SSC) and the Advisory Panel (AP) provide recommendations to the Council. The SSC is made up of scientists and economists, and the AP's membership covers a variety of fishing industry sectors as well as conservation groups. Representatives on

	Fishery Management Council December 8-14, 2010. Hilton Hotel, Anchorage, Alaska. Meeting included SSC, AP, and Council plenary sessions. Global Trust: Dave Garforth, Steve Grabacki	the SSC, Council, and AP are from Oregon, Washington, and Alaska. The public can comment in each meeting, but usually a person will choose to comment in the AP and repeat his or her comment in the Council meeting. Recommendations of the Plan Teams with respect to Allowable Biological Catch (ABC/s), Total Allowable Catch (TAC/s) etc... are vetted by the SSC. The SSC recommendations are reviewed by the AP. At this stage in a proposal process, resource users and interested parties can comment on the recommendations. The recommendations proposed through the SSC and AP are read at the Council's plenary sessions who make the final decision on recommendations. The Council reports the decision on recommendations to the Secretary of Commerce who has ultimate authority, although decisions are virtually never disapproved. Plan Teams and the SSCs are tasked with conservation decisions which take place without input from users in order that conservation is maintained separate from allocative issues. The AP and NPFMC make allocation and management decisions based on these conservation decisions. **Agenda Items specific to the Alaska salmon fisheries witnessed at the meetings:** **Salmon FMP Discussion Paper, December 2010** A comprehensive discussion document was presented at the December Council meeting which focused upon clarifying and up-dating the FMP for salmon in the US EEZ with respect to its application in Alaska Federal waters. While the Plan has been amended on nine occasions previously, the Council recognized that the that the salmon FMP is vague with respect to management authority for the three directed commercial salmon fisheries that occur in the EEZ west of Cape Suckling. The document noted that the salmon FMP must be updated in order to comply with the current Magnuson-Stevens Act requirements, and it should be amended to more clearly reflect the Council's desires with regard to the state of Alaska continued management authority over commercial fisheries in the West Area EEZ, the Southeast Alaska commercial troll fishery, and the sport fishery. The various options presented in the discussion requiring Council discussion, clarification and direction were summarized (http://www.fakr.noaa.gov/npfmc/fmp/salmon/SalmonPPT1210.pdf*).* The full motion adopted is available at http://www.fakr.noaa.gov/npfmc/fmp/salmon/SalmonFMPmotion1210.pdf. In brief the Council determined that the salmon FMP must be updated to comply with the current MSA requirements and should be amended to more clearly reflect the Council's desire for continued state management authority over directed commercial salmon fisheries in the West Area EEZ, Southeast Alaska troll fishery, and sport fishery. A possible schedule through 2011 for analysis of the salmon FMP was presented in the report.

Gulf of Alaska (GOA) Chinook salmon by-catch (Agenda C-5)

Council Agenda Item C-5 concerning the Gulf of Alaska Chinook salmon bycatch was presented. The level of GOA Chinook salmon bycatch in 2010 exceeded the incidental take amount authorized in the Biological Opinion for Endangered Chinook salmon stocks, resulting in consultation being reinitiated between NMFS Alaska Region and the Northwest Region office.

A staff discussion paper was presented (Nov 2010) which presented the current Chinook bycatch levels, rates and analysis, focusing mainly on GoA ground fisheries. The Report described disaggregated spatial mapping of Chinook bycatch by year and discussion of what considerations and measures were necessary in order to apply effective management of Chinook bycatch in these fisheries. The NPFMC has adopted measures for the control of bycatch species through groundfish fishery management plans for Alaska, although to date, bycatch control measures had not been adopted for incidental takes of salmon in GOA groundfish fisheries. The discussions centered upon a requirement for full retention of salmon in GOA groundfish fisheries, the stock assessment data for larger GOA Chinook salmon producing streams, challenges presented to the determination of river of origin and limitations of the current GOA groundfish observer data for enforcing Prohibited Species Catch (PSC) limits, Maximum Retainable Amount (MRA) caps and directing in-season management decisions.

Chinook remains the dominant salmon species taken as bycatch in the GOA followed by chum. Very few other salmon species were noted in reports reviewed by the Assessment Team. Bycatch Chinook in the last 5 years was reported to be 26,732 salmon (2006-2010), exceeding the twenty year average of 20,185 salmon, with particularly high number reported in recent years, including preliminary estimates of 51,258 in 2010, the majority of which (31,039) occurring in the Western area of GOA.

NOAA Technical Memorandum NMFS-AFSC-2005 (Cahalan *et al.*, 2010) outlines the procedures for extrapolated observed bycatch numbers to unobserved trips to derive an estimate.

The report notes that bycatch of Chinook occurs mainly in the Pollock trawl fisheries with very few salmon taken by non trawl fisheries. Census is challenging due to the operation of the hauling activity which does not allow for separation of catch. Observer sampling is difficult for this reason, although shore-side processing allows counting

once catch is sorted.

Percentage coverage by the current observer program was discussed and presented in the discussion paper. Because current observer coverage requirements are generally based on vessel length, the proportion of total catch that is observed in GOA groundfish fisheries is much lower than, for example, in the Bering Sea fisheries. In the western GOA, the proportion of catch that is caught while an observer is onboard ranges from 25-36% over the years 2004-2007; in the central GOA the range is from 32% to 37%. In comparison, the average percentage of observed catch in the Bering Sea is approximately 86%, and in the Aleutian Islands is approximately 95%.

To tackle this, the Council had already taken final action to restructure the observer program for vessels that have less than 100% coverage in federal fisheries with the reported objective of providing NMFS with the flexibility to deploy observers in response to fishery management needs and to reduce the bias inherent in the exiting program.

Detailed instructions on the procedures observers use to collect the data which are inputs into the estimation process can be found in the series of observer manuals available at: http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2010.pdf.

The discussion noted that there are 3 of the Chinook stocks of the Pacific Northwest that are listed on the Endangered Species Act were known to be caught as bycatch in the Alaska groundfish fisheries. These are reported as Lower Columbia River, Upper Willamette River and Upper Columbia River. A Biological Opinion established that a threshold of 40,000 Chinook salmon can be caught as bycatch in the GOA groundfish fisheries.

FINAL Council motion. The final outcome of the deliberations was as follows:

The Council adopted the following problem statement and moves the following alternatives for initial review.

Problem statement:

Chinook salmon bycatch taken incidentally in GOA groundfish fisheries is a concern, and no salmon bycatch control measures have been implemented to date. Current observer coverage levels and protocols in some GOA groundfish trawl fisheries raise concerns about bycatch estimates and may limit sampling opportunities. Limited information is available on the origin of Chinook salmon taken as bycatch in the GOA; it is thought that the harvests include stocks from Asia, Alaska, British Columbia, and lower 48 origin. Despite management actions by the State of Alaska to reduce Chinook salmon mortality in sport, commercial, and subsistence fisheries, minimum Chinook salmon

		escapement goals in some river systems have not been achieved in recent years. In addition, the level of GOA Chinook salmon bycatch in 2010 has exceeded the incidental take amount in the Biological Opinion for Endangered Species Act (ESA)listed Chinook salmon stocks. The sharp increase in 2010 Chinook bycatch levels in the GOA fisheries require implementing short-term and long-term management measures to reduce salmon bycatch to the extent practicable under National Standard 9 of the Magnuson-Stevens Act. In the short term, measures focused on the GOA pollock fisheries are expected to provide the greatest savings. In the long term, comprehensive salmon bycatch management in the GOA is needed. A range of alternative options for management measures were presented including setting PSC hard cap limits for Chinook by-catch and options for apportioning these between Central and Western areas of GOA. Measures to expand area coverage for all vessels were presented under and the salmon bycatch control cooperative membership which would require that in order to fish in the Central or Western GOA pollock fisheries a vessel must be a member of a salmon bycatch control cooperative for the area where they are participating. Contractual agreements among other things, would establish a bycatch pool or cooperative for hotspot area management. In conclusion, while there are obvious management concerns on the interception of Chinook salmon in the Alaska pollock and other groundfish fisheries in the Gulf of Alaska, there is a responsible approach demonstrated by management to the quantification and resolution of the issue through the formal management processes available to Alaska salmon fisheries. The Council promptly published a newsletter of summaries of its deliberations and decisions very soon after the meeting; the newsletter for this and all previous Council meetings is available at http://www.fakr.noaa.gov/npfmc/default.htm.

6. Assessment Outcome Summary

This section provides a summary of the outcome of evidence that has been evaluated by the Assessment Team for the conformance of US Alaska salmon fisheries to the FAO-Based RFM Conformance Criteria. The summary information is presented for each of the fundamental clauses (1 to 14) that form the FAO-Based RFM Conformance Criteria. These are divided into the 6 key components of responsible fisheries management (A-F).

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

Section 7 documents the more detailed outcomes of the evidence that has been reviewed, evaluated and presented for each of the individual supporting clauses of the FAO-Based Conformance Criteria.

A. The Fisheries Management System

1. There must be a structured and legally mandated management system based upon and respecting International, National and local fishery laws and considering other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment.

Alaska's salmon fisheries are managed under a clear structure of laws, regulations, treaties, and other legal mandates and instruments, at the international, national (State), and local (state) levels. This management process is well-established and transparent. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) or Magnuson-Stevens Act (MSA) is the primary domestic legislation governing the management of American fisheries. For the State of Alaska, Section 4 (Sustained Yield) of Article VIII of Alaska's Constitution state 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 Commercial Fisheries Division is responsible for conservation of Alaska's salmon stocks and for management of the commercial fisheries. Management measures take into account the whole salmon stock unit over its entire area of stock distribution. For the salmon fisheries, ADFG's main priority is achieving escapement, which ensures that enough fish escape the fisheries, and spawn in their natal rivers.

Escapement goals necessarily take into account each stock unit over its entire area of distribution, because escapement is the "net result" of all factors which have influenced each stock during its juvenile stages in freshwater, its oceanic migration, and the fisheries to which it is subjected. The biological unity of each stock (eg- Kenai River Chinook salmon, Naknek River sockeye salmon) is explicitly taken into account in ADFG's

setting of escapement goals, and in the management of the fisheries, which ensures escapement as its first priority. ADFG's fishery managers in each area produce annual management reports and similar documents, deliberately taking into account all previously-agreed management measures. Representatives of 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 actively foster cooperation among States with regard to salmon fisheries research, development and management. ADFG fosters routine (both annual and in-season) review and revision of conservation and management measures within the Commercial Fisheries division, and between the latter and the BoF. The management arrangements and decision-making processes for Alaska salmon fisheries are organized in a very transparent manner, and are readily accessible on the ADFG website.

2. Management Organizations must participate in coastal area management related institutional frameworks, 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 the avoidance of conflict among users.

A large number of organizations participate in coastal area management-related institutional frameworks through the Alaska Coastal Management Plan (ACMP) planning and the federal National Environmental Policy Act (NEPA) process. State agencies involved include five divisions of ADFG, four divisions of the Department of Environmental Conservation, and nine divisions of the Department of Natural Resources. Federal agencies include the U.S. Forest Service, U.S. Fish and Wildlife Service, NMFS, U.S. Army Corps of Engineers, and the Environmental Protection Agency. Alaska participates in the NOAA coastal zone management (CZM) program as one of the 34 states with approved coastal management plans. Representatives from fishery management organizations and fishing communities participate in coastal area management planning through ACMP and the federal 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 BoF process serves to provide a forum for fishery conflict resolution. Further, the ACMP review process, as well as in many cases the NEPA process, deliberately takes into account all resources and users of those resources in order to resolve potential conflicts among users before project approvals are given. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures. ADFG biologists work closely with the public, local user groups including commercial fishing organizations and recreational anglers, and with other fishery enforcement staff to keep the public aware of the need to protect and manage coastal resources. ADFG also operates public education programs that illustrate the importance of salmon to Alaska's culture, economy and ecosystem. A wide range of publications on Alaska's fishery resources are produced, such as public access to angling waters, importance of bag limits for conservation of stocks and general code of conduct of public when utilizing the amenity of the coastal and river environment.

All Regulations are printed and made available to fishery participants and public alike. These activities are supported by the Officers of the Alaska Wildlife Troopers who support through on the ground enforcement. 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.

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

The BoF main role is to conserve and develop the fishery resources of the state. The BoF is charged with making allocative decisions, and ADFG is responsible for management based on those decisions. Management Plans are established by the BoF for each Region and incorporated into regulation in Title 5 Alaska Administrative Code. Those plans are implemented each season in each Region by the responsible ADFG biologist following the direction of the BoF.

The Alaska Commercial Fisheries Entry Commission (CFEC) helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting entry into each regional salmon fishery to permitted harvesters. Exploitation remains economically viable 1) through the conservation and protection of the reproductive capacity of the stocks by the inseason management of harvest by ADFG, under their management plans and 2) through the allocation of harvest among various user groups by the periodic actions of the BoF.

Management plans on recovery of depleted stocks are active policy of the state and are based on providing adequate 'escapement' or spawning stock in each generation. The BoF's 'Mixed Stock Policy' provides for the restriction of fisheries on stocks "where there are known conservation problems". Salmon fishing gear (purse seine, drift gill net, set gill net, troll and fish wheel) has been refined through long practice to harvest salmon efficiently and as exclusively as possible. Fishing limits are set by ADFG and approved by the BoF. The interest of small-scale harvesters is protected in Law, Regulation and Policy. Also, subsistence uses are given preference in law over other uses in fishery management. Through the years, the BoF and ADFG made continuing progress in establishing biologically based escapement goals for salmon stocks and in improving methods of stock assessment. Conservation of the biodiversity of aquatic habitats and ecosystems is the responsibility of Habitat Division within ADFG. Activities by individuals, private companies or agencies within streams used by anadromous fish require permission of ADFG.

B. Science and Stock Assessment Activities

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

There are thousands of salmon runs and diverse fisheries located over a vast area in Alaska. Since statehood Alaska has made a serious effort to effectively manage its salmon resources for sustained yield. ADFG is responsible for acquiring the fishery dependant and independent information necessary to effectively manage commercial, sport, subsistence, and personal use fisheries. It maintains a large staff of research and management biologists (totaling over 350), located throughout the state, who are responsible for supervising the field data collection, laboratory work, data analysis, and reporting. Many of the data collection activities have taken place over a long time period, and have been modified over time to assure that adequate and representative samples are taken. ADFG maintains a staff of biometricians, who review operation plans and assist with data analysis for stock assessment projects to ensure that the resulting estimates are statistically valid. ADFG operates an efficient data collection and analysis system that is effective in managing Alaska's salmon resources.

Alaska generally does not require onboard observers for salmon fisheries. However, sampling programs are implemented that allow managers to observe and sample the catch from all fisheries when needed.

Alaska understands the importance of considering all factors affecting any fishery and have developed programs to ensure that data regarding the necessary social, economic, and institutional factors affecting the state's salmon fisheries are obtained and considered.

There is a clear separation of roles between ADFG and the BoF. ADFG provides biological and fisheries management information and recommendations and the BoF evaluates this information in addition to numerous types of social, economic and institutional factors when making regulatory decisions that affect allocations of resources between user groups. Social, economic, and institutional information is often brought to the attention of the BoF by Advisory Committees located throughout the state (82 in total) as well as through comments from the general public and user groups.

The Commercial Fisheries Entry Commission (CFEC) was established to promote the economic viability of Alaska's fisheries as well ensure conservation and sustained use management of fisheries resources. Ensuring that individual fishermen receive adequate economic benefit by limiting the number of participants in Alaska's fisheries is a primary consideration when limiting participation. The CFEC also annually estimates the value of fish harvested in Alaska as well as the value of limited entry permits. Salmon bycatch in trawl fisheries for walleye pollock in the Bering Sea and Gulf of Alaska are monitored by NMFS with an onboard observer program. The NMFS also produced a final rule (Amendment 91 to the BSAI Groundfish Fisheries) on establishing Prohibited Species Catch limits as well as an incentive plan to reduce Chinook salmon bycatch in the Bering Sea pollock fisheries.

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

Alaska understands the importance of its salmon resource and, since statehood, has dedicated a significant effort in developing an extensive institutional framework necessary to studying and managing this resource to meet the constitutional mandate for sustained yield. Each year, ADFG staff located throughout the state define the data needs for management of each salmon fishery, develop statistically valid study designs, and collect, analyze, and report the data necessary for effective fisheries management following procedures detailed in its study plans. Each step of this process is guided by state policies, standards, and/or nationally recognized scientific standards. Alaska manages thousands of salmon runs and has developed a sophisticated system of fishery and habitat monitoring projects to ensure that stocks are managed for sustained yield. The majority of Alaskan salmon fisheries occur on Alaskan stocks, but Alaska understands the global nature of fisheries management issues and cooperates with international organizations when issues affecting Alaska salmon or fisheries occur. The State has numerous cooperative technical, stock assessment, and management interactions with other States and management organizations that deal with trans-boundary salmon stocks that are harvested in Alaska. Alaska has a strong research analysis and reporting program that respects the confidentiality of the data it obtains, and closely monitors its salmon management programs and implements needed research projects when the need arises and when funding permits.

C. The Precautionary Approach

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

Article 8.4 of the Alaska constitution mandates that the fish and other natural resources of Alaska “shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.” There is ample evidence, both in regulation, and in stock status reports and escapement goal reports to the BoF that Alaska uses a precautionary approach when defining and managing for reference points for each salmon stocks.

The continuing productivity of the majority of Alaska’s salmon stocks is evidence of the effectiveness of these policies and regulations. The primary reference points for salmon management are escapement goals. All of Alaska’s salmon fisheries have been divided into individual runs or aggregates of runs for management purposes. For each of these individual runs or stock aggregates, an escapement goal has been established. In-season management tools, principally the Emergency Order gives local, ADFG staff the authority to effectively manage closure of fisheries in a real time sense, where there is a risk that escapement goals may not be met in order to protect spawning escapement.

7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient a suitable method using risk assessment must be adopted to take into account uncertainty.

State Regulation, the Policy for the Management of Sustainable Salmon Fisheries, 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. In relation to the precautionary approach it specifies "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". The precautionary approach is also applied into the Management Plan for High Impact Emerging Fisheries and the Policy for Management of Mixed Stock Salmon Fisheries. The statewide Sustainable Salmon Policy mandates that escapement goals must be established for all exploited salmon stocks. 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 stocks of concern.

D. Management Measures

8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

Biologically established Escapement Goals (BEG) form the principal control rule for setting harvest limits. BEGs are usually established using stock-recruit information which generally requires multiple years of run reconstructions to establish. BEGs are expressed as a range based on factors such the productivity of the stock and data uncertainty. A Sustainable Escapement Goal (SEG) is the level of past escapement (as demonstrated by escapement counts or indices) that has resulted in sustainable yield over a 5-10 year period. SEGs are used when data are insufficient to establish a BEG, usually due to lack of stock specific harvest data. SEGs are also set as a range and take into account uncertainty of the data. Once established, ADFG attempts to manage fisheries to maintain an even distribution of escapement within the boundaries of a BEG or SEG. Two other, less common escapement goals are also defined in the Sustainable Salmon Policy. A Sustainable Escapement Threshold (SET) is a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. The SET is below the lower bound of a BEG or SEG and is established when needed for salmon stocks of management or conservation concern. An Optimum Escapement Goal (OEG) is a specific management objective for salmon escapement that considers biological and allocative factors and may differ from BEG or SEG. An OEG may be expressed as a range but the minimum bound of an OEG will always be above the SET.

Every three years (based on the BoF schedule) each 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) reviews the status of all stocks within a management area, recommends new and modified escapement goals based on the new data that have been collected and analyzed in the past three years, defines stocks of concern, and develops management or action plans to deal with fishery management issues. State Regulation, 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's process provides a transparent, accessible route for all fishery participants and stakeholders to submit proposals and ultimately cause legitimate amendment to fishery regulations for the sustainable use of the resource through verifiable, objective based review of information, including from traditional sources.

Fishery monitoring and stock assessment programs collect escapement data, age, sex, size, tag recoveries, and run timing information from both the spawning portion of the stock and the fish harvested in commercial, sport, subsistence, and personal use fisheries, stock separation information, harvest estimates and catch sampling, and environmental information. Coded wire tag and otolith marks are collected on hatchery fish to support identification and abundance of hatchery fish in catches of natural fisheries and potential strays into native stock systems.

Alaska law prohibits "wanton waste", such as the discarding of salmon by salmon harvesters (AS 16.05.831, SF 75.065). Bycatch of non-targeted species is not a major issue in most Alaska salmon fisheries. Most non-targeted fish harvested in salmon fisheries are other species of salmon and are reported on fish tickets.

Management measures that are implemented through Alaska fishing regulations, management plans, and inseason management actions are often specifically designed to minimize the harvest of non-targeted salmon species. Salmon bycatch in trawl fisheries for walleye pollock in the Bering Sea and Gulf of Alaska are monitored by NMFS with an onboard observer program. The NMFS also produced a final rule (Amendment 91 to the BSAI Groundfish Fisheries) on establishing Prohibited Species Catch limits as well as an incentive plan to reduce Chinook salmon bycatch in the Bering Sea pollock fisheries. The NPFMC is currently moving forward with a similar program for the Gulf of Alaska. ADFG has implemented significant restrictions on chum and Chinook salmon fisheries in areas of western Alaska in response to declining returns, and reducing the trawl bycatch is part of the planned effort to help restore these stocks.

Time and area restrictions limit when and where specific fisheries occur and restrictions are also imposed by regulation on all types of fishing gear (e.g., mesh size restrictions and length of nets for gillnets, number of fishing lines, rods, and gurdies for troll gear, and mesh size, net length and depth for purse seine gear). Emergency Orders are used to close or limit access to fisheries based on information on run strength and escapement goals. All gear types in Alaska are strictly regulated. Types of legal gear are listed in 5AAC 39.105. Specific requirement for gear (i.e. gillnet length, depth, and mesh sizes) are defined for each area and in specific management plans and regulations.

9. There must be defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels.

Management measures to maintain salmon stocks at maximum sustainable levels include maintaining fishing capacity at levels suitable for that purpose. The biodiversity of aquatic habitats and ecosystems is safeguarded primarily by "clean" fishing practices and by sound fisheries management.

Since statehood, ADFG has compiled databases on salmon runs for each of the 5 species and within the Regions and Districts of Alaska. Alaska has a large and ongoing fishery monitoring and stock assessment program to obtain the extensive scientific information necessary to establish new escapement goals, modify existing escapement goals, and provide other scientific information that allows fisheries to be managed to achieve escapement goals or other benchmarks (such as harvest quotas or allocations).

Salmon fisheries in Alaska are generally gear, area and time specific, thus resulting in fairly species-specific harvests. For many fisheries, ADFG prepares fishery-specific management plans in advance of each salmon season. The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) directs ADFG to report to the BoF on the status of salmon stocks and to Identify specific stocks that represent a concern based on yield, management, or conservation.

Generally, review teams comprised of staff from the Commercial and Sport Fish Divisions examine escapement goals by region and report potential problems with stocks to the BoF at regularly scheduled meetings. Each year, the Division of Commercial Fisheries prepares "annual management reports" (AMRs) for most fishery management areas in the state. Although the AMRs focus primarily on commercial fisheries, most also routinely summarize basic harvest information for subsistence fisheries.

In Northwest Alaska and for the Yukon and Kuskokwim Rivers, more detailed annual reports about subsistence fisheries harvest assessment programs are prepared (ADFG, 2005). The Federal Subsistence Management Program is a multi-agency effort to provide the opportunity for a subsistence way of life for rural Alaskans on federal public lands and waters while maintaining healthy populations of fish and wildlife. Time and area restrictions limit when and where specific fisheries occur and restrictions are also imposed by regulation on all types of fishing. Operation of all salmon fishing gear (purse seines, gillnets, and troll gear) is required to minimize incidental harvest of non-target species. Specific regulations also exist pertaining to bycatch of non-target species. All salmon by-catches in salmon fisheries are landed and reported on fish ticket. ADFG participates in research programs on an international basis with other entities on issues such as fishing gear selectivity and improvements to fishing methods and strategies.

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

There are a myriad of educational and training programs available to Alaska salmon fishermen, ranging from maritime topics like Bridge Resource Management and Radar Observer, to seafood topics like HACCP and direct marketing. Alaska's fisheries are extremely compliant with the FAO Code. Anyone who seeks to understand Alaska's fisheries management process unavoidably winds up becoming very familiar with the FAO Code. Alaska statutes (Title 16, or AS16) and regulations (Alaska Administrative Code 5, or 5 AAC) mandate proper markings for salmon fishing gear, on a region-specific basis. All types of Alaska salmon fishing gear are tightly regulated in their construction, methods of deployment, and times and areas of use, so as to minimize bycatch and discards.

E. Implementation, Monitoring and Control

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

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 time and area based on observed escapements, commercial fishery performance (e.g., catch per unit of effort), test fishing, biological data on age, sex and size, historical run timing curves and other data.

The Division of Wildlife Troopers in the Department of Public Safety (known as Alaska Wildlife Troopers, or AWT) is charged with protecting the state's natural resources through reducing illegal harvest, waste and illegal sale of commercially and sport harvested fish, and by safeguarding fish and wildlife habitat.

The U.S. Coast Guard (USCG) also enforces boating safety laws and fishing vessels are often under surveillance by AWT and the USCG during fishing operations. For fisheries under federal management, the NOAA Fisheries Office for Law Enforcement (OLE) enforces federal laws that protect and conserve Alaska's living marine resources and their habitat. The Alaska Limited Entry system only allows legally permitted vessels to operate in salmon fisheries. The "right to fish" is embodied in a permit card that is issued annually. Cooperation and coordination among ADFG, AWT, USCG, and OLE is frequent and routine.

The NPAFC made up 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 fish, in the high seas area of the North Pacific Ocean that are beyond national boundaries.

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

Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5). These enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation. Withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel is also among the enforcement options. Within the USA EEZ, penalties can range up through forfeiture of the catch to forfeiture of the vessel, including financial penalties and prison sentences.

These laws and regulations are enforced by the Alaska Department of Public Safety, Alaska State Troopers, a Division of Alaska Wildlife Troopers (AWT). AWT coordinates with, and is supported by, law enforcement personnel from USCG and NMFS Office of Law Enforcement (OLE). In addition, AWT has increased undercover fisheries operations for sport and commercial fisheries over last 3 years. A fully staffed investigations unit dedicates time to commercial investigations.

F. Serious Impacts of the Fishery on the Ecosystem

13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.

Alaska's Sustainable Salmon Policy includes provisions addressing the potential effects of ecological changes/perturbations on sustainably allowable harvest in that salmon fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning. Potential ecological effects on salmon stocks are incorporated in the establishment of escapement goals for each stock. The allowable harvest in each year is set with respect to the goal. If a stock chronically fails to realize escapement goals it is reported by ADFG to the BoF as a stock of concern (either 'conservation', 'management' or 'yield stock of concern') and the management plan is amended to protect the productivity of the stock; an action plan is associated with the management plan for any new or expanding salmon fisheries, or stocks of concern. These action plans should contain goals, measurable and implementable objectives, and provisions. Introduction of new gear or methods or operations into Alaska salmon fisheries is rare or absent. State law and regulation specify gear and its size (i.e. legal gear in commercial fisheries includes only gillnet, seine, troll for which maximum sizes are specified.) Under these restrictions gear and methods and operations have become marginally more technologically and operationally efficient year by year but these changes, because harvest rates are controlled within biological limitations, are not considered to have 'habitat disturbance impact on the fisheries and ecosystems.'

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

Ocean ranching, salmon aquaculture for fishery enhancement is practiced widely by non-profit private sector corporations (PNPs) for the purpose of enhancing Common Property Fishery (CPF) harvest. The activities of those corporations, i.e. their salmon hatcheries and the harvest of the salmon they produce, are regulated so as to avoid or minimize effects on genetic diversity of wild salmon and on ecosystem integrity by the state through the ADFG including 1) the location of hatcheries with respect to wild salmon stocks, and with respect to fisheries on those stocks so as to present minimal risk of overharvest to wild stocks in mixture fisheries, 2) the propagation of locally adapted stocks so as to present minimal risk of genetic damage to wild stocks. Locations and sizes of hatcheries are first of all considered by Regional Planning Teams comprised of ADFG biologists and officials and of members of the regional fishery enhancement corporations, i.e. members of the fisheries and communities in the region in question.

These Teams and the Plans for which they are responsible are charged with considering effects of proposed hatcheries on the productivity of wild salmon stocks (i.e. genetic fitness of wild salmon stocks) as well as economic and social effects of hatcheries. Permits for fishery enhancement hatcheries and operations of the hatcheries are both regulated by the ADFG. Criteria required in permits and operating plans relate to 1) fish pathogens and health, 2) gene conservation and 3) harvest management. These permitting requirements and operational requirements have been successful in preventing known introduction of any exotic, novel, fish pathogen into Alaskan stocks. They have been successful in preventing propagation of stocks of salmon not endemic to the region in which they are released. There are no 'stocks of concern' brought to that state by the activities of hatcheries.

Major advances have been made over the 35 years history of the Alaska salmon fishery enhancement program, particularly the practice since the early 1990s of applying a discriminating mark to the substantial majority of the hundreds of millions of juvenile salmon released each year, i.e. the otolith thermal marking program. Some ecological problems are however also being revealed by this technology. In this respect, ongoing research sponsored by ADFG is evaluating the extent of the problem. Alaska Sustainable Salmon Fund projects 45473 and 45863 are being carried out by ADFG Commercial Fisheries Division, studying straying by hatchery salmon in Prince William Sound. Alaska Sustainable Salmon Fund project 45957 is being carried out by the University of Alaska and ADFG studying effects of gene introgression from hatchery-produced salmon on wild stocks of salmon.

Also, the NPAFC conducts the High Seas Salmon Research Program in which it plans and coordinates research by scientists from member nations on the broad topics 1) status and trends of stocks and of the structure and diversity of stocks and 2) effects of climate change on salmon stocks. The US National Oceanic and Atmospheric Administration (NOAA) at its Fisheries laboratory at Auke Bay, Alaska, in addition to cooperating in NPAFC's high seas research program, conducts a program of Marine Ecology of Juvenile Salmon in which they cooperate with the University of Alaska and with ADFG. This research is based on long term sampling and process-oriented study of both Hatchery and Wild juvenile salmon in the coastal ocean where survival of salmon cohorts is determined. These time-series and process-oriented studies have revealed no compelling evidence of ecological interaction of Hatchery and Wild salmon in the coastal marine habitat.

Responsible aquatic farming of shellfish and aquatic plants is promoted and regulated by Alaska Statutes and enforced in regulations. Establishing an aquatic farm requires permission of the Alaska Department of Natural Resources (ADNR), Division of Mining, Land & Water which requires that a proposed farm is consistent with the Alaska Coastal Management Program standards and policies administered by ADNR. Ecological sustainability is an objective of the ADFG Operating Permit required of farm operators. They are required to report and control disease. The conditions under which wild stocks of aquatic plants and shellfish can be used or displaced are regulated to prevent introduction of pathogens. Transport of seed is regulated so as to prevent introduction of exotic and potentially invasive organisms. Rational use of shared resources is an objective of the periodically reviewed Site License issued by the Alaska Department of Natural Resources (ADNR), Division of Mining, Land & Water.

6.1 Conformity Statement

The Assessment Team recommends that the management system of the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the State management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

The Assessment Team was content that no non conforming areas of the Alaska salmon fishery management system arose against the FAO-Based Responsible Fisheries Management Criteria. All evidence reviewed and analyzed was rated as 'high confidence'.

Confidence ratings are assigned as 'low', 'medium' or 'high'. Low and medium confidence ratings would result in a non conformity against that particular clause; either at the minor or major non conformance level.

In the following section (7.0) at the beginning of each fundamental clause, a summary table of the confidence ratings assigned for each supporting clause is provided. For example, for fundamental clause 1, there are 13 supporting clauses each of which was assigned a high confidence rating (13 out of 13).

Determination:

The appointed members of the Global Trust Certification Committee met on the 11th of March 2011. After detailed discussion, the Committee determined that the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the state management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

7. FAO-Based Conformance Criteria Assessment Outcome

A. The Fisheries Management System

1. There must be a structured and legally mandated management system based upon and respecting International, National and local fishery laws and considering other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment.
FAO 7.1.3/7.1.4/7.1.9/7.3.1/7.3.2/7.3.4/7.6.8/7.7.1/10.3.1

Confidence Ratings	Low	None	Medium	None	High	13 out of 13

Clause:
1.1 There must be an effective legal and administrative framework established at the local and national level appropriate, for fishery resource conservation and management.
***FAO Criteria* 7.7.1**

Evidence adequacy rating:
☑ High ☐ Medium ☐ Low

Clause	Evidence
1.1	Almost all of Alaska's salmon fisheries take place in the internal waters (0-3 nm, and other enclosed waters) of the State of Alaska. Alaska manages those fisheries under the authority of its Constitution, statutes (laws), and regulations (administrative code) – * Article VIII of Alaska's Constitution states: Section 4. 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. * "Alaska's Constitution: A Citizen's Guide (Fourth Edition)" explains: "This section bolsters the commitment to conservation found in Section 2. The principle of sustained yield management is a basic tenet of conservation: the annual harvest of a biological resource should not exceed the annual regeneration of that resource. Maximum sustained yield is the largest harvest that can be maintained year after year. State law defines maximum sustained yield as 'the achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the state land consistent with multiple use' (AS 38.04.910). At the time of the constitutional convention, stocks of Alaska's salmon had been reduced to a sad remnant of their past bounty by neglect of the sustained yield maxim. The qualifying phrase 'subject to preferences among beneficial uses' signals recognition by the delegates that not all the demands made upon resources can be satisfied, and that prudent resource management based on modern conservation

	principles necessarily involves prioritizing competing uses." * Statutes (also termed "laws") are enacted by the state Legislature. Title 16 of Alaska Statutes (AS16) "Fish And Game" sets forth the laws which govern the management of Alaska's salmon fisheries, as well as myriad other living resources. Like all other statutes, Title 16 is consistent with the Constitution. * Regulations (also termed "administrative code") are developed and implemented by departments of the Executive branch of government, which is headed by the Governor. Title 5 of the Alaska Administrative Code (5AAC) "Fish And Game" is the body of state regulations by which Alaska's salmon fisheries are managed. All regulations must be consistent with the governing statutes; that is, 5AAC is consistent with AS16. Of particular relevance to this assessment are – 1. Commercial and Subsistence Fishing and Private Nonprofit Salmon Hatcheries. (5 AAC 1 - 5 AAC 41) 6. Fish and Game Advisory Committees. (5 AAC 96 - 5 AAC 98) ADFG Commercial Fisheries Division is responsible for conservation of Alaska's salmon stocks and for management of the commercial fisheries. In addition, the Sport Fish, Subsistence and Habitat division, as well as the BoF, all have responsibility for salmon conservation. The BoF is responsible for fishery policy and allocation among users. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA or MSA) is the primary domestic legislation governing the management of American fisheries. Under the MSFCMA, the fisheries of the American EEZ off Alaska are managed by the NPFMC. The NPFMC produced a Fishery Management Plan for Alaska salmon fisheries, which gives management authority to ADFG. ***sources of evidence –*** * Alaska Constitution Article VIII, Section 4 * Alaska Statutes Title 16 * Alaska Administrative Code Title 5 * ADFG Commercial Fisheries http://www.cf.adfg.state.ak.us/ * Alaska Board of Fisheries http://www.boards.adfg.state.ak.us/fishinfo/index.php * Fishery Management Plan for the Salmon Fisheries in the US EEZ off the Coast of Alaska (North Pacific Fishery Management Council) * Regulations: http://www.cf.adfg.state.ak.us/geninfo/regs/cf_regs.php

Clause:

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

1.2.1 The area through which the species migrates during its life cycle must be considered by the management system.

1.2.2 The biological unity and other biological characteristics of the stock must be considered within the management system.

1.2.3 All fishery removals and mortality must be considered by the management system.

1.2.4 Previously-agreed management measures established and applied in the same region must be taken into account by the management system.

FAO Criteria 7.3.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence:
1.2	Unlike most other commercially harvested fishes, Alaska salmon are anadromous and semelparous. The fisheries for these species do not usually occur out on the open sea, they generally take place relatively near the salmon's natal streams (with exceptions such as SE Troll Fishery, SSE gillnet), as the sexually mature fish conduct their spawning migration. Salmon are faithful to their stream and their stock can be referred to their natal river. This means that common fisheries management methods, such as setting of Total Allowable Catches, are not usually appropriate for Alaska salmon. For the salmon fisheries, ADFG's main priority is escapement, which ensures that enough fish escape the fisheries, and spawn in their natal rivers. The total number of salmon returning to a given river (the "run" or "return") is usually much greater than the escapement level. That amount, over and above escapement, may be harvested by commercial, recreational, personal use, or subsistence fisheries. If the run of salmon is not greater than the escapement goal, then ADFG attempts to stop or minimize harvest. In other words, the escapement goals necessarily take into account each stock unit over its entire area of distribution, because escapement is the "net result" of all factors which have influenced each stock during its juvenile stages in freshwater, its oceanic migration, and the fisheries to which it is subjected. ***sources of evidence –*** 5 AAC 39.223 Policy for Statewide Salmon Escapement Goals.
1.2.1	All five species of Alaska salmon are faithfully anadromous and home to their natal streams. Their migration begins in Alaska's freshwater habitats, which the fish depart on their way to marine habitats. These habitats are monitored, studied, and protected by the ADFG. The monitoring and studies are performed by scientists of ADFG under the US and NOAA fisheries service, NIMFS and other agencies, such as the U.S. Fish & Wildlife Service (USFWS), and the results are made available to the public through the agencies' websites. The protection of salmon habitat is performed by ADFG's Habitat Division, pursuant to Title 16 of Alaska Statutes (AS16). The Habitat Division routinely coordinates with other relevant agencies, such as the NMFS. ***sources of evidence –*** http://www.cf.adfg.state.ak.us/geninfo/pubs/pubshome.php

	http://www.habitat.adfg.alaska.gov/ http://www.sf.adfg.state.ak.us/statewide/
1.2.2	**The biological unity and other biological characteristics of the stock must be considered within the management system.** There is not one stock of each species of Alaska salmon, there are a great many stocks, each belonging to their natal stream and freshwater habitats. Because Alaska salmon are anadromous, they cannot properly be considered to be one stock, as would be the case for many other species. Every salmon species and each run have particular characteristics such as size, freshwater habitat characteristics, food preferences, ocean migration patterns, spawning run timing, etc. all of which are considered in ADFG's setting of escapement goals, and in the management of the fisheries, which ensures escapement as its first priority. ***sources of evidence –*** 5 AAC 39.223 Policy for Statewide Salmon Escapement Goals.
1.2.3	**All fishery removals and mortality must be considered by the management system.** As explained in clause 1.2 (above), escapement of salmon to their spawning grounds is the net result of both natural mortality and fishing mortality. By having the maintenance of escapement as its highest priority, ADFG ensures that all forms of mortality are considered. ***sources of evidence –*** 5 AAC 39.223 Policy for Statewide Salmon Escapement Goals.
1.2.4	**Previously-agreed management measures established and applied in the same region must be taken into account by the management system.** ADFG's fishery managers in each area produce annual management reports and similar documents. These reports explain how the fisheries were prosecuted and managed in a given year, how that differed from the previous year(s), and the results of any changes implemented by ADFG or imposed by the BoF. In addition, regulations such as allocation criteria and subsistence determinations also take into consideration past use and management. In this way, the management system deliberately takes into account all previously-agreed management measures. ***sources of evidence –*** The annual management reports and similar documents are readily available at the ADFG Commercial Fisheries websites for each area * Southeast Alaska – http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1mp.php http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1amr.php * Prince William Sound – http://www.cf.adfg.state.ak.us/region2/pwshome.php * Cook Inlet – http://www.cf.adfg.state.ak.us/region2/ucihome.php http://www.cf.adfg.state.ak.us/region2/lcihome.php * Kodiak & Westward – http://www.cf.adfg.state.ak.us/region4/finfish/salmon/salmhom4.php * Bristol Bay – http://www.cf.adfg.state.ak.us/region2/finfish/salmon/bbayhome.php * Arctic-Yukon-Kuskokwim – http://www.cf.adfg.state.ak.us/region3/kuskhome.php

Clause:

1.3 Where trans-boundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the Applicant Management Organizations concerned must cooperate to ensure effective conservation and management of the resources.

1.3.1 The management system of the Applicant fishery must take part in formal fishery commission or arrangements that have been appointed for the management of shared, straddling, high seas or highly migratory fish stocks.

1.3.2 Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks must be compatible.

FAO Criteria 7.1.3 /7.1.4/7.3.2

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause	Evidence
1.3	Representatives of ADFG and NMFS routinely and actively participate in several relevant fora and organizations, including, but not limited to – * North Pacific Anadromous Fish Commission * Pacific Salmon Commission * Pacific States Marine Fisheries Commission ***sources of evidence –*** http://www.npafc.org/new/index.html http://www.psc.org/ http://www.psmfc.org/
1.3.1	Representatives of ADFG and NMFS routinely and actively participate in several relevant fora and organizations, including, but not limited to – * North Pacific Anadromous Fish Commission * Pacific Salmon Commission * Pacific States Marine Fisheries Commission ***sources of evidence –*** http://www.npafc.org/new/index.html http://www.psc.org/ http://www.psmfc.org/
1.3.2	Each of the above-cited organizations in which ADFG and NMFS salmon scientists and managers participate strives for compatibility in their management measures. These organizations have sustained yield and conservation as their highest priority even in cases where different states are competing for the same resource (i.e. US and Canada). ***sources of evidence –*** http://www.npafc.org/new/index.html http://www.psc.org/ http://www.psmfc.org/ As with all migratory and straddling fishery species there is debate and often dispute on the management of these stocks in national and international waters. Fundamental agreements on management and arrangements for furthering research exist for Pacific

	salmon throughout the range of the five species; these include: a prohibition of high seas fishing for salmon by all nations involved (Japan, Canada and the United States, Trilateral Pacific Salmon Treaty) and supporting this, research policies that further understanding on marine range, distribution of each major strain of Pacific salmon. However, within the international arena of salmon management in the North Pacific, incompatibilities in approach can exist. However, these internationally mandated organizations (refer to 1.4) have made commitments to common objectives and form the resolutions that act toward improving compatibility within the management arrangements of the contracting parties. Within the US and Alaska, there is a strong track record of implementing agreements and resolutions made at these Commissions into Federal or State law.

Clause:

1.4 Organizations within the Management System must cooperate with neighboring coastal states with respect to common and shared fishery resources for their conservation and for the conservation of the environment.

FAO Criteria 10.3.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause	Evidence
1.4	Representatives of ADFG and NMFS routinely and actively participate in several relevant fora and organizations, including, but not limited to – * **North Pacific Anadromous Fish Commission** (Japan, Korea, Canada, USA). The main objective of the Convention is to promote the conservation of anadromous stocks in the Convention Area, waters of the North Pacific Ocean and its adjacent seas, north of 33 degrees North Latitude beyond 200-miles zones of the coastal States. Key convention measures are: 1. Prohibition of directed fishing for anadromous fish in the Convention Area. 2. Minimization to the maximum extent of the incidental taking of anadromous fish 3. Prohibition of the retention on board a fishing vessel of anadromous fish taken as an incidental catch during fishing for non-anadromous fish. *** Pacific Salmon Commission** (USA and Canada governments appointed Commission) for joint cooperation under the Pacific Salmon Treaty. The Treaty embodies the commitment made by Canada and the United States to carry out the enhancement programs so as to: • prevent over-fishing and provide for optimum production, and • ensure that both countries receive benefits equal to the production of salmon originati

	* **Pacific States Marine Fisheries Commission (US)** PSMFC promotes, as well as supports policies and actions to conserve, develop, and manage fishery resources in California, Oregon, Washington, Idaho and Alaska. ***sources of evidence –*** http://www.npafc.org/new/index.html http://www.psc.org/ http://www.psmfc.org/

Clause:

1.5 The Applicant fishery's management system must actively foster cooperation between States with regard to:

- **Fisheries research**
- **Fisheries management**
- **Fisheries development**

FAO Criteria 7.3.4

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause	Evidence
1.5	Representatives of ADFG and NMFS routinely and actively participate in several relevant fora and organizations, including, but not limited to – * North Pacific Anadromous Fish Commission * Pacific Salmon Commission * Pacific States Marine Fisheries Commission 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 seek to obtain information about the ecosystem and status and management of salmon fisheries. Examples include: the North Pacific Research Board (NPRB) *which funds "… 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 Wild Salmon Center works to protect the best remaining wild salmon ecosystems across the Pacific Rim**;** The Pacific States Marine Fisheries Commission coordinates research activities, monitors fishing activities, and collects and maintains databases on salmon, steelhead and other marine fish occurring off the coast of California, Oregon, Washington, Idaho, and Alaska**;** The Pacific Coastal Salmon Recovery Fund was established by Congress in 2000 to provide project funding to states and tribes of the Pacific Coast Region to protect, restore, and conserve Pacific salmon and steelhead populations and their habitats; and the Saltonstall-Kennedy grant program for fisheries research and development is a fund administered by the NMFS to provide grants or cooperative agreements for fisheries research and development.

	sources of evidence – http://www.npafc.org/new/index.html http://www.psc.org/ http://www.psmfc.org/ http://www.nprb.org/index.html/ http://www.wildsalmoncenter.org/ http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/Index.cfm http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm

Clause:

1.6. Procedures must 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 must be established within the management system.**
- **A mechanism for revision of management measures must exist.**

FAO Criteria 7.6.8

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause	Evidence
	Alaska's salmon fisheries are managed by ADFG. The Division of Commercial fisheries manages commercial harvests, and in conjunction with the Division of Subsistence, removals by subsistence fishermen. The Division of Sport Fisheries manages sport and personal use resource removals (Figure 1). Every three years (based on the 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) reviews the status of all stocks within a management area, recommends new and modified escapement goals based on the new data that have been collected and analyzed in the past three years, defines stocks of concern, and develops management or action plans to deal with fishery management issues (examples of recent stock status and escapement goal reports presented to the BoF are: Witteveen *et al.*, 2009; Otis *et al.*, 2010, Morstad and Baker 2009; Volk *et al.*, 2009; Menard and Bergstrom 2009; Howard *et al.*, 2009; Baker *et al.*, 2009; and Erickson *et al.*, 2009). Also, there is frequent, routine (both annual and in-season) review and revision of conservation and management measures within Commercial Fisheries Division, and between the Commercial Fisheries Division and the BoF. The interested reader is invited to – * make year-to-year comparisons among Annual Management Reports (to understand the annual cycle of review and revision) * examine the Emergency Orders (EOs) implemented by ADFG salmon fishery managers (to understand the in-season process of review and revision).

	sources of evidence – * Southeast Alaska – http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1mp.php http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1amr.php * Prince William Sound – http://www.cf.adfg.state.ak.us/region2/pwshome.php * Cook Inlet – http://www.cf.adfg.state.ak.us/region2/ucihome.php http://www.cf.adfg.state.ak.us/region2/lcihome.php * Kodiak & Westward – http://www.cf.adfg.state.ak.us/region4/finfish/salmon/salmhom4.php * Bristol Bay – http://www.cf.adfg.state.ak.us/region2/finfish/salmon/bbayhome.php * Arctic-Yukon-Kuskokwim – http://www.cf.adfg.state.ak.us/region3/kuskhome.php http://www.cf.adfg.state.ak.us/region3/nomehome.php

Clause:

1.7 The management arrangements and decision making processes for the fishery must be organized in a transparent manner.

- **Management arrangements**
- **Decision-making**

FAO Criteria 7.1.9

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
1.7	The management arrangements and decision-making processes for Alaska salmon fisheries are organized in a very transparent manner, and are readily accessible to any person. Management arrangements generally take one of two forms: annual (pre-season) and in-season. Both types of arrangements may be examined at the websites of each ADFG Commercial Fisheries Division fishing area. In each case, the rationale for each management decision is clearly presented. Decision-making also generally takes two forms. The decisions made by Commercial Fisheries Division managers are, as stated above, clearly presented on the relevant webpages. The decision-making process of the BoF is transparent and readily accessible via the BoF's website, by attendance at the BoF meetings, and by active stakeholder participation in the BoF's decision-making process. In fact, the BoF actively and routinely encourages stakeholder involvement in the process. The BoF meets four to six times per year in communities around the state to consider proposed changes to fisheries regulations around the state. The BoF uses the biological and socioeconomic information provided by ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law to create sound and enforceable regulations.

	sources of evidence – * Board of Fisheries – http://www.boards.adfg.state.ak.us/fishinfo/index.php * Southeast Alaska – http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1mp.php http://www.cf.adfg.state.ak.us/region1/finfish/salmon/s1amr.php * Prince William Sound – http://www.cf.adfg.state.ak.us/region2/pwshome.php * Cook Inlet – http://www.cf.adfg.state.ak.us/region2/ucihome.php http://www.cf.adfg.state.ak.us/region2/lcihome.php * Kodiak & Westward – http://www.cf.adfg.state.ak.us/region4/finfish/salmon/salmhom4.php * Bristol Bay – http://www.cf.adfg.state.ak.us/region2/finfish/salmon/bbayhome.php * Arctic-Yukon-Kuskokwim – http://www.cf.adfg.state.ak.us/region3/kuskhome.php http://www.cf.adfg.state.ak.us/region3/nomehome.php

2. Management Organizations must participate in coastal area management related institutional frameworks, 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 the avoidance of conflict among users.

FAO Criteria 10.1.1/10.1.2/10.1.4/10.2.1/10.2.2/10.2.4

Confidence Ratings	Low	None	Medium	None	High	7 out of 7

Clause:

2.1 An appropriate policy, legal and institutional framework must be adopted in order to achieve sustainable and integrated use of living marine resources, taking into account the fragility of coastal ecosystems and the finite nature of their natural resources and the needs of coastal communities.

FAO Criteria 10.1.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
2.1	The salmon fishery management organizations in Alaska (principally ADFG) participate in coastal area management-related institutional frameworks through the Alaska Coastal Management Plan (ACMP) and the federal National Environmental Policy Act (NEPA) processes. These include 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 ACMP includes a state coastal plan, coastal district (local government) plans, standards for evaluating and managing uses and activities in the coastal zone, and a process to coordinate state resource agency permitting and approval of uses and activities in the coastal zone. The program was initially motivated by a desire to influence federal off-shore activities; however, over time has become an important planning and coordination tool for coastal zone related topics and interests. The program requires management of habitats in the coastal area that are subject to the ACMP "so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat which contribute to its capacity to support living resources." The ACMP is implemented through federal and state agencies and through local governments. State agencies involved include three divisions of ADFG, four divisions of the Department of Environmental Conservation, and nine divisions of the Department of Natural Resources. Federal agencies include the U.S. Forest Service, U.S. Fish and Wildlife Service, NMFS, U.S. Army Corps of Engineers, and the Environmental Protection Agency. Alaska participates in the NOAA coastal zone management (CZM) program as one of the 34 states with approved coastal management plans. Approval of the ACMP was through a formal review process in the U.S. Department of Commerce NOAA in accordance with Coastal Zone Management Act (CZMA) section 306 that requires

	extensive federal review, public hearings and coordination with the National Environmental Policy Act (NEPA). http://coastalmanagement.noaa.gov/programs/czm.html The ACMP was reapproved by the federal Office of Ocean and Coastal Resource Management (OCRM) in December 2005. http://alaskacoast.state.ak.us/Clawhome/handbook/pdf/OCRM_Approval.pdf All construction activities in the coastal zone (e.g., work on docks, breakwaters, harbors and other infrastructure) are subject to the ACMP review process as well as in many cases the NEPA process. These processes deliberately take into account all resources and users of those resources. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures. 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 its authorities provide considerable opportunity to maintain high quality fish and wildlife habitat through pollution prevention. ADFG protects estuarine and marine habitats primarily through cooperative efforts involving other state and federal agencies and local governments. ADFG has jurisdiction over the mouths of designated anadromous fish streams and legislatively designated state special areas (critical habitat areas, sanctuaries and refuges). 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. This includes most of the state's tidelands out to the three mile limit and approximately 34,000 miles of coastline. DNR authorizes the use of log-transfer sites, access across state land and water, set-net sites for commercial gill net fishing, mariculture sites for shellfish farming, lodge sites and access for the tourism industry, and water rights and water use authorizations. DNR also uses the state Endangered Species Act to preserve natural habitat of species or subspecies of fish and wildlife that are threatened with extinction. For the ACMP, the entire coastline of Alaska is divided into coastal districts, each of which has, or will have, a Coastal Management Plan approved by the state. Thirty-five coastal districts including four Coastal Resource Service Areas have been established in Alaska. They range in size from Pelican at 0.4 miles of coastline to Cenaliulrit with 8,995 miles of shoreline. Thirty-three of the 35 districts have coastal management plans. A special component of district plans are "Areas Meriting Special Attention" that are discrete areas managed for a particular resource value or use. Approved district plans include Enforceable Policies that delineate suitable uses and activities for the coastal area according to state statute and Department of Natural Resources regulations (i.e. 11 AAC 112 http://alaskacoast.state.ak.us/Clawhome/handbook/pdf/11_AAC_112.pdf) A coastal project questionnaire must be completed for each project proposed in the coastal zone. Alaska uses a multiple agency coordinated system for reviewing and processing all resource-related permits required for proposed projects in or affecting coastal areas of Alaska. This process, called "project consistency review," is based on the ACMP and is designed to improve management practices for use of Alaska's coastal land and water. Project proposals are reviewed to determine the project's consistency

	with the written standards of the ACMP and the enforceable policies of approved district coastal management districts. The state's review process includes participation by: the project applicant; state resource agencies including DEC, ADFG, and DNR; the affected local coastal district office; and other interested members of the public, including fishermen's organizations and private individuals http://alaskacoast.state.ak.us/Projects/pcpq.html. The Alaska Region of NOAA Fisheries oversees sustainable fisheries that produce about half the fish caught in US waters, with responsibilities covering 842,000 square nautical miles off Alaska. The Alaska Region also works to protect and enhance Alaska's marine habitat http://www.fakr.noaa.gov/. The ACMP and NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. Decisions are made through public processes and involvement of fishery managers, fishermen, fishing organizations and fishing communities is actively invited through publicly advertized and scheduled meetings. Assessing the social and cultural value of coastal resources is stated as an explicit part of the decision making process for allocation and use of resources. Federal land management agencies including the U.S. Forest Service (USFS), the Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service (USFWS) participate in the ACMP project review and approval process along with the state resource agencies mentioned above. The USFS and BLM manage the majority of federal upland that is adjacent to marine water in Alaska and that contains many of the freshwater bodies important for the spawning and rearing of salmon. These federal agencies also participate with ADFG staff and fisherman's organizations in the Regional salmon Planning Team (RPT) process in Southeast, Yakutat, Prince William Sound, Cook Inlet, Kodiak, Chignik, Alaska Peninsula, Bristol Bay, the Yukon River basin, Norton Sound, and the Kotzebue Sound regions (McGee, S.G. 2004. Salmon Hatcheries in Alaska – plans, permits, and policies designed to provide protection for wild stocks. American Fisheries Society Symposium 44:317-331). ADFG fisheries management staff at the regional and areas levels meet routinely with federal fisheries staff at both formal and informal meetings to discuss salmon fishery-related activities including research projects, in-season management issues and coastal developments. Area Biologists and other ADFG employees also routinely meet with fishery groups, environmental groups, developers, and other agencies with management authority (e.g., USFS, NMFS, and USFWS) to ensure that the needs of Alaska's fisheries are considered when making decisions about development or policies. In addition, the BoF process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities to participate in the development of legal regulations for all salmon fisheries in the state. The BoF ensures that the process for the state's regulatory system relating to fish and wildlife resources operates publicly, efficiently and effectively. ADFG staff provides support for this public process, and ensures that the system is legal, timely, and accessible to the citizens of the state. The BoF is a seven member board appointed by

	the governor and confirmed by the legislature which sets fishing seasons, bag limits, methods and means for the state's commercial, subsistence, sport, guided sport, and personal use fisheries. It also sets policy and direction for management of the state's fishery resources and makes all decisions on allocation of those resources among users. ADFG then manages the fisheries based on BoF regulations. The enabling statute for the BoF is AS 16.05.251. Regulations enacted by the BoF are found in the Alaska Administrative Code (AAC) Title 5, Chapters 1 – 77. The Joint Boards of Fisheries and Game periodically meet for mutual issues such as non-subsistence use areas and the advisory committee system. Statutes describing the Joint Boards and the subsistence law include AS 16.05.258 and AS 16.05.315. Regulations enacted by the Joint Boards are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 and 99. Advisory Committees (AC) are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources. ADFG staff regularly attend the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 82 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BoF meetings. The enabling statute for the AC system is AS 16.05.260. Regulations governing the ACs are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97 http://www.boards.adfg.state.ak.us/bbs/what/prps.php.

Clause:

2.2 Representatives of the fisheries sector and fishing communities must be consulted in the decision-making processes involved in other activities related to coastal area management planning and development.

FAO Criteria 10.1.2

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
2.2	Representatives from fishery management organizations and fishing communities participate in coastal area management planning through the Alaska Coastal Management Plan (ACMP) and 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. Alaska participates in the NOAA coastal zone management (CZM) program as one of the 34 states with approved coastal management plans http://coastalmanagement.noaa.gov/programs/czm.html. The federal government reapproved the ACMP in December 2005 http://alaskacoast.state.ak.us/Clawhome/handbook/pdf/OCRM_Approval.pdf.

All construction activities in the coastal zone (e.g., work on docks, breakwaters, harbors and other infrastructure) are subject to the ACMP review process as well as in many cases the NEPA process. These processes deliberately take into account all resources and users of those resources. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures.

For the ACMP, the entire coastline of Alaska is divided into coastal districts each of which has, or will have, a Coastal Management Plan approved by the state. Approved district plans include Enforceable Policies that delineate suitable uses and activities for that district's area according to state statutes and Department of Natural Resources regulations (e.g. 11 AAC 112 http://alaskacoast.state.ak.us/Clawhome/handbook/pdf/11_AAC_112.pdf.

A coastal project questionnaire must be completed for each project proposed in the coastal zone. Alaska uses a multiple-agency-coordinated system for reviewing and processing all resource-related permits required for proposed projects in, or that affect, coastal areas of Alaska. This process, called "project consistency review," is designed to improve management practices for use of coastal land and water. Project proposals are reviewed to determine the project's consistency with the written standards of the ACMP and the enforceable policies of approved coastal management districts. The review process requires participation by: the project 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 http://alaskacoast.state.ak.us/Projects/pcpq.html.

Other state and federal programs affecting fishery resources in Alaska include the National Fish Habitat Action Plan administered by the U.S. Fish and Wildlife Service (USFWS). The mission of this program is to protect, restore and enhance fish and aquatic communities through partnerships with state and local groups and agencies. In Alaska, partners in this program include ADFG, the Cook Inlet Aquaculture Association, and the Nature Conservancy.

ADFG sport fish area managers work closely with the BoF, recreational anglers and federal and international regulatory bodies to develop fishing regulations and solutions to issues that are, according to divisional policy described in the Strategic Plan, effective, minimally intrusive, and enforceable. In all regions of the state, these managers actively monitor fish stocks and sport fisheries make adjustments in season as required, work closely with enforcement staff in policing fisheries, maintain a dialogue with local user groups and recreational anglers, assist in habitat conservation and restoration, and provide local expertise to the angling public (Sport Fish Division Strategic Plan 2010).

In addition, the BoF process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities to participate in the development of legal regulations for all salmon fisheries in the state. The BoF ensures that the process for the state's regulatory system relating to fish and wildlife resources

	operates publicly, efficiently and effectively. ADFG staff provides support for this public process, and ensure that the system is legal, timely, and accessible to all citizens of the state. The BoF Advisory Committees (AC) are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources. Currently, there are 82 advisory committees in the state, of which approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BoF meetings. The enabling statute for the AC system is AS 16.05.260. Regulations governing the ACs are found at 5 AAC 96 – 97 http://www.boards.adfg.state.ak.us/bbs/what/prps.php. As additional verification that the management system is structured so as to actively promote involvement from fishery participants, communities and stakeholders, the Assessment Team witnessed the BoF meeting process Nov 15-19th held in Homer, AK for the Lower Cook Inlet fisheries. There, the system of proposing amendments and changes to specific fishery management regulations was observed first hand. Proposers follow a transparent and accessible process of formally documenting their concerns and requests for modifications to the local management system (although any proposal may have wider Statewide interest) through a Briefing Book. Proposals are read through the committee process and decisions on the proposals are taken by the BoF in an open, public forum. Documentation received from the Executive Director of the BoF, provided a breakdown of proposals. In 2006-07, more than 50% came directly from individuals. ACs representatives actively attend the meeting cycle for their regions. ADFG staff and fisherman's organizations also participate, along with federal agencies including the U.S. Forest Service and the Bureau of Land Management, in the Regional salmon Planning Team (RPT) process in the Southeast, Yakutat, Prince William Sound, Cook Inlet, Kodiak, Chignik, Alaska Peninsula, Bristol Bay, the Yukon River basin, Norton Sound, and the Kotzebue Sound regions (McGee, S.G. 2004. Salmon Hatcheries in Alaska – plans, permits, and policies designed to provide protection for wild stocks. American Fisheries Society Symposium 44:317-331).

Clause:

2.3 Fisheries practices that avoid conflict among bottom resource users and other users of the coastal area must be adopted.

2.3.1 Procedures and mechanisms must be established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other users of the coastal area.

FAO Criteria 10.1.4/10.1.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
2.3	The BoF process serves to provide a forum for fishery conflict resolution. Further, the ACMP review process, as well as in many cases the NEPA process, deliberately takes into account all resources and users of those resources in order to resolve potential conflicts among users before project approvals are given. The BoF is a seven member board appointed by the governor and confirmed by the legislature which sets fishing seasons, bag limits, methods and means for the state's commercial, subsistence, sport, guided sport, and personal use fisheries. It also sets policy and direction for management of the state's fishery resources and makes all decisions on allocation of those resources among users. ADFG then manages the fisheries based on BoF regulations. As a part of making decisions on allocation of the fishery resources, the BoF sets fishery openings by gear-type by time and area. When there are concerns that conflict may arise between gear-types, the BoF generally requires the different gear types to operate in separate areas or at different times. For example, in Cook Inlet fishing regulations at 5 AAC 21.320 state: Weekly fishing periods (a) In the set gillnet fishery, (1) salmon may be taken in the Northern District from 7:00 a.m. Monday until 7:00 p.m. Monday and from 7:00 a.m. Thursday until 7:00 p.m. Thursday; (2) salmon may be taken in the Central District from 7:00 a.m. Monday until 7:00 p.m. Monday and from 7:00 a.m. Thursday until 7:00 p.m. Thursday; (3) salmon may be taken in the Southern District from 6:00 a.m. Monday until 6:00 a.m. Wednesday and from 6:00 a.m. Thursday until 6:00 a.m. Saturday; (4) the fishing periods set forth in (1) - (3) of this subsection may be modified by emergency order.(b) In the drift gillnet fishery, (1) salmon may be taken in the Central District from 7:00 a.m. Monday until 7:00 p.m. Monday and from 7:00 a.m. Thursday until 7:00 p.m. Thursday, except salmon may be taken (A) in the Chinitna Bay Subdistrict only during periods established by emergency order; (B) repealed 6/13/99; (2) the fishing periods set forth in (1) of this subsection may be modified by emergency order. (c) In the seine fishery, salmon may be taken in the (1) Chinitna Bay Subdistrict of the Central District only during periods established by emergency order; (2) Kamishak Bay, Outer, Eastern, and Southern Districts only during periods established by emergency order. Furthermore for Cook Inlet, regulation 5 AAC 21.335 (Minimum distance between units of

	gear) specifies that (a) no part of a commercial drift gillnet or set gillnet may be set or operated within 600 feet of any part of another commercial set gillnet; (c) in the Chinitna Bay Subdistrict, no part of a purse seine may be placed or operated within 600 feet of a drift or set gillnet.; (d) except as specified in (c) of this section, no part of a seine may be operated within 300 feet of a set gillnet except in the zone outside of the offshore end of a set gillnet. In Prince William Sound, according to 5 AAC 24.330(a) drift gillnets may be used in the Coghill, Unakwik, Eshamy, Copper River and Bering River Districts, (b) set gillnets may be used in the Eshamy District and (c) purse seines may be used in all districts, except for the Eshamy, Copper River, and Bering River Districts, in accordance with the Prince William Sound Management and Salmon Enhancement Allocation Plan at 5 AAC 24.370. Furthermore, according to 5 AAC 24.335 no part of a set gillnet may be set or operated within 100 fathoms of any part of another set gillnet, except in the Main Bay Subdistrict as provided in 5 AAC 24.367(c) (4). In the Crafton Island Subdistrict, no part of a drift gillnet may be operated within 60 fathoms of a set gillnet, except in the zone outside of the offshore end of the set gillnet. These regulations are designed primarily to eliminate conflict among fishers. The ACMP review process, as well as in many cases the NEPA process, deliberately takes into account all resources and users of those resources in order to resolve potential conflicts among users before project approvals are given. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures. However, in most cases project approvals are withheld until substantive conflicts are resolved.
2.3.1	**Procedures and mechanisms must be established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other users of the coastal area.** The Alaska Coastal Management Plan review process, as well as in many cases the federal NEPA process, deliberately takes into account all resources and users of those resources in order to resolve potential conflicts among users before development project approvals are given. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures. The BoF process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities to participate in the development of legal regulations for all salmon fisheries in the state. The BoF ensures that the process for the state's regulatory system relating to fish and wildlife resources operates publicly, efficiently and effectively. It provides an opportunity for anyone with a potential conflict with a fishery to air those issues in a public forum. ADFG staff provides support for this public process, and ensures that the system is legal, timely, and accessible to all citizens of the state. Similarly, the NPFMC provides a forum for resolution of potential national and international fisheries conflicts. The NPFMC works closely with ADFG and the BoF to

	coordinate fishery management programs in state and federal waters off Alaska to address fish habitat concerns, catch limits, allocation issues and other management issues. The enabling legislation for the NPFMC process was the 1976 Fishery Conservation and Management Act (aka Magnuson-Stevens Act) which was intended to: prevent overfishing; base fishery decisions on the best science; manage individual stocks throughout their range; allocate fairly between residents of different states; promote efficiency, minimize costs and avoid duplication; take into account the importance of fishery resources to communities and minimize adverse impacts to them; and minimize bycatch of non-target species and the fishing mortality associated with it.

Clause: **2.4 The public must be kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected.** ***FAO Criteria 10.2.4***	
Evidence adequacy rating: **☑ High** **☐ Medium** **☐ Low**	
Clause:	**Evidence**
2.4	There is ample evidence that Area Management Biologists work closely with enforcement staff in policing fisheries, maintain a dialogue with local users groups including commercial fishing organizations and recreational anglers, assist in fish habitat conservation and restoration and provide local fishery expertise to the public. At a meeting with the Alaska State Wildlife Troopers in Juneau, June 2010, an overview of the day to day operations and coordination between ADFG staff and AWT was conveyed. AWT offices are open to public who can obtain copies of fishery regulations and associated materials. ADFG operates public education programs including the moble "salmon in the classroom," and "Alaska's Wild Salmon" that illustrate the importance of salmon to Alaska's culture, economy and ecosystem. ADFG also provides educational materials to educators and the public, both on-line and in hard copy, and participates regularly in public attended Sportsman Shows, Commercial Fisheries Trade shows and Gear Group meetings to interact with and educate thousands of members of the public (Sport Fish Strategic Plan 2010). In Cook Inlet at the Kachemak Bay Research Reserve, education and research staff regularly demonstrate how science and education improve coastal management and increase public awareness and understanding of the nation's estuaries. In Kachemak Bay they provide an integrated set of education, outreach and training programs linked to regional research efforts that strengthen understanding, appreciation and stewardship of the Kachemak Bay environment. Public discovery labs, guided estuary ecology walks, brown bag lunch lectures from experts, training programs for decision makers, visits from elementary classes, outdoor family programs (e.g., "Kids in Nature") encourage more public dialogue about the ecological principles and managerial concerns that govern the coastal, marine, and estuarine environments http://www.habitat.adfg.state.ak.us/. In 2007, ADFG Sport Fish Division developed an Aquatic Resources Implementation Plan for Alaska's Comprehensive Wildlife Conservation Strategy (CWCS). The intent of the plan

	is to initiate or expand partnerships with other agencies and non-governmental organizations (NGO's) to conserve, improve, and manage Alaska's habitats for aquatic species, develop education and outreach programs and materials related to aquatic species and their habitats, and to develop curricula and supporting material that describes the relationship between aquatic species, sport-fished species, and the importance of aquatic habitats by providing targeted audiences with educational programs that focus on aquatic resource-based stewardship principles and encourage active stewardship practices. The division plans to develop a CWCS aquatic species notebook series and publish articles regarding the implementation of CWCS for aquatic species in the *Otolith* and *Alaska Wildlife News*. Activities such as these serve to keep the public aware of the need to participate in the protection and management of coastal resources http://www.sf.adfg.state.ak.us/Static/statewide/NG_plan/PDFs/CWCSPlan.pdf.

Clause:

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

- **Economic assessment**
- **Social and cultural assessment**

FAO Criteria 10.2.

Clause:	Evidence
2.5	The value of coastal salmon resources from economic, cultural and social perspectives are regularly assessed in order to assist decision makers with 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. Through continuing research on economic conditions for each limited-entry fishery, CFEC maintains publicly accessible data bases showing current and historic information on numbers of permits issued/renewed, number of permits actually fished, total weight of fish harvested, average gross earnings per permit for Alaska residents and non-residents, and average selling price of permits in each fishery http://www.cfec.state.ak.us/bit/MNUSALM.htm. Economic impacts of the private non-profit salmon hatchery program in Southeast Alaska have been assessed regularly by the McDowell Group http://www.nsraa.org/_pdfs/McDowell_SEHatchery6_2010.pdf. The Alaska Coastal Management Plan (ACMP) and National Environmental Policy Act (NEPA) processes provide the public with information and opportunity for public involvement that is robust and inclusive at both the state and federal levels. Decisions are made through public processes and involvement of fishery managers, fishermen, fishing organizations and fishing communities is actively invited through publicly advertized and scheduled meetings. Assessing the social and cultural value of coastal resources is stated as an explicit part of the decision making process for allocation and use of resources. Subsistence fishing in Alaska is critical to the cultural and economic well being of more than 100,000 Alaska Natives and non-Natives living in rural Alaska. The average rural subsistence harvest of fish and wildlife in Alaska is about 375 pounds of food per person

per year. That is more than the U.S. average consumption of 255 pounds of domestic meat, fish, and poultry per year. Nowhere else in the United States is there such a heavy reliance upon wild food. However, only about 4% of the fish harvested in Alaska is used for subsistence purposes http://seagrant.uaf.edu/map/fisheries/index.html.

The Federal Subsistence Management Program is a multi-agency federal effort to provide the opportunity for a subsistence way of life for rural Alaskans on federally managed public lands and waters while maintaining healthy populations of fish and wildlife. This dependence on wild resources is cultural, social and economic. Alaska's indigenous inhabitants have relied upon the traditional harvest of wild foods for thousands of years and have passed this way of life, its culture, and values down through generations. Subsistence has also become important to many non-Native Alaskans, particularly in rural Alaska http://alaska.fws.gov/asm/about.cfml.

The mission of the ADFG Subsistence Division is to scientifically gather, quantify, evaluate and report on customary and traditional uses of the state's fish and wildlife resources, and to then provide this information to fisheries and wildlife programs and to the BoF for their use in determining reasonable opportunities for customary and traditional use. ADFG maintains an online library of detailed reports on customary and traditional use of fish and game resources in Alaska http://www.subsistence.adfg.state.ak.us/pubs/dsp_Adv_Search_Results.cfm.

The Limited Entry Act was passed in 1973 in order to provide resource conservation and prevent economic distress among Alaskan fishers. Some of the key features included issuance of permits to natural persons only, prohibition on permit leasing, prohibition on use of permits as collateral for loans and allowance for free transferability of permits between persons. Thus, permit holders are free to transfer their permits through gift, inheritance or sale. According to Commercial Fishery Entry Commission (CFEC) reports, many people are concerned that free transferability of fishing permits might have undesirable impacts on Alaskan communities and result in erosion of their economic base. CFEC examines these issues through research and preparation of reports on the status of permits and changes in their distribution http://www.cfec.state.ak.us/Publications/permit_holdings.htm.

CFEC suggests limited entry protected Alaskan fisheries from an influx of new fishermen from other West Coast fisheries where fishing opportunities have been severely reduced by court decisions and stock status concerns. The program was designed based on salmon fisheries that are characterized by owner/operator participants and fishery management based on escapement.

Participants in a fishery who believe the number of gear operators should be limited in order to preserve the resource and economic health of the fishery can initiate the limited entry process. If research by CFEC indicates limiting entry to the fishery would help solve the problem, the commission establishes a maximum number of permits for the fishery based upon historic participation levels. Next, CFEC develops a point system to rank eligible applicants according to the relative degree of hardship they would suffer if not awarded an entry permit. The basic criteria used to evaluate hardship are: 1)establishing that economic dependence upon the fishery exists (which could include determining the percentage of income derived from the fishery and amount of investment in a vessel and

	gear); and 2) past history of participation in the fishery, including the consistency and number of years that applicant participated. A person must have legally participated in the fishery, held the required licenses, and made at least one landing of fish during an eligible period prior to the established qualification date in order to qualify for that period. A specific application period, usually a few months in length, is established for each limited fishery. All persons who are eligible to apply must submit their applications during the specified time period. CFEC is continuing to study alternative types of limited entry for fisheries managed by a harvest quota.

Clause: **2.6 In accordance with capacities, measures must be taken to establish or promote the establishment of systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters.** ***FAO Criteria 10.2.4***	
Evidence adequacy rating: **☑ High** **☐ Medium** **☐ Low**	
Clause:	**Evidence**
2.6	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. 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 and other ecologically-related species. 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. New genetic and otolith marking techniques developed by the member states of Canada, Japan, Korea, Russia, and the United States (including Alaska) are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The Commercial Fisheries, Sport Fish, Habitat and Subsistence Divisions of ADFG have substantial research components that monitor biological, chemical, physical, and in some cases economic and social, parameters of the coastal environment. The results of this research are published in several series of departmental scientific and technical publications that document data and results of divisional research activities and are generally available online through the following links: http://www.cf.adfg.state.ak.us/geninfo/pubs/pubsseries.php http://www.sf.adfg.state.ak.us/statewide/sfpubs.cfm http://www.habitat.adfg.alaska.gov/techrepts.php http://www.subsistence.adfg.state.ak.us/geninfo/publctns/techpap.cfm http://www.cf.adfg.state.ak.us/geninfo/pubs/pubs_resources.php.

	These research reports also present results from research continually being done in many areas of Alaska on genetic stock identification, salmon coded-wire-tag and thermal marking, and fish pathology. Funding for ADFG research efforts is derived from state and national sources including the Alaska Sustainable Salmon Fund http://www.akssf.org/. The Sport Fish Division devotes 32% of its funding to research activities and includes the Kachemak Bay Research Reserve, which is protected for long-term research, water-quality monitoring, education and coastal stewardship http://www.sf.adfg.state.ak.us/StratPlan/. ADFG participates in research programs on an international basis with other entities on issues such as fishing gear selectivity and improvements to fishing methods and strategies. Results of such research and technology transfer are disseminated through entities such as the NPAFC. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYKSSI) was established to collaboratively develop and implement a comprehensive research plan to understand causes of the decline in and recovery of AYK salmon stocks. AYKSSI has funded 55 research projects with over $20 million in funding. Included in this effort are research projects on salmon genetics, selectivity in fisheries, and escapement goals http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf. Monitoring of the coastal environment in Alaska is also being done by federal agencies including the U.S. Forest Service, U.S. Fish and Wildlife Service, and the NMFS as well as many institutions of higher learning including the University of Alaska Institute of Marine Science (IMS). IMS faculty and research staff provides expertise in marine biology, biological oceanography, physical, chemical and geological oceanography. With an annual research budget of approximately $5.5 million, current IMS projects include Northeast Pacific near-surface monitoring of temperature, salinity and fluorescence, polycyclic aromatic hydrocarbon research, and Arctic ocean biodiversity http://www.ims.uaf.edu/. Non-governmental organizations, including the Northern and Southern Southeast, Cook Inlet, Prince William Sound and Kodiak Regional Aquaculture Associations, the Nature Conservancy and others, also participate in monitoring the coastal environment in Alaska.

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

FAO 7.3.3/7.2.2/7.6.10

Confidence Ratings	Low	None	Medium	None	High	8 out of 8

Clause:

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

FAO Criteria 7.3.3

Evidence adequacy rating:

☑ High ☐ Medium ☐ Low

Clause:	Evidence
3.1	The BoF main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of 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 are primarily in 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 http://www.boards.adfg.state.ak.us/fishinfo/regs/mixedsal.pdf. 39.222 Policy for the Management of Sustainable Salmon Fisheries http://www.boards.adfg.state.ak.us/fishinfo/regs/ssfptext.pdf. 39.223 Policy for Statewide Salmon Escapement Goals http://www.boards.adfg.state.ak.us/fishinfo/regs/escpgoal.pdf. The basic elements of commercial fishery Management Plans are established by the BoF for each Region and incorporated into regulation in Title 5 Alaska Administrative Code (Listing Regions North to South with embedded links to the pertinent plan): Ch 3 Kotzebue Ch 4 Norton Sound/Port Clarence Ch 5 Yukon Northern Ch 6 Bristol Bay Ch 7 Kuskokwim Ch 9 Alaska Peninsula Ch 11 Atka Amlia Islands Ch 12 Aleutian Islands Ch 15 Chignik Ch 18 Kodiak

	Ch 21 Cook Inlet Ch 24 Prince William Sound Ch 30 Yakutat Area Ch 33 Southeastern Ch 29 Troll Fishery Commercial Fishery Management Plans are implemented each season in each Region for each particular salmon fishery by the responsible Alaska Dept. of Fish & Game biologist located in the region under the direction of the BoF, and they are openly published: e.g. the 2010 Southeast Alaska Drift Gillnet Fishery Management Plan . Plans are implemented at the regional, area, local level by the responsible biologist. In some the form is a formal report as referenced here; others take the form of memoranda issued closer to the season but in any case the responsible biologist acts under the authority of the BoF. Management Plans are also in force under state regulation for other fisheries (Subsistence Fishery, 5 AAC 01; Personal Use Fishery 5 AAC 77; Sport Fishery 5 AAC 47 – 75). While these plans primarily affect management of non-commercial fisheries, some directly involve the management of commercial fisheries, for example, the Redoubt Bay and Lake Sockeye Salmon Fisheries Management Plan (5AAC 01.760 of the subsistence finfish section) contains the allocation for all the fisheries (including the commercial fishery) as well as the trigger points for managing the commercial fishery.

Clause:

3.2 Management measures shall provide inter alia that:

3.2.1 Excess fishing capacity is avoided and exploitation of the stocks remains economically viable;

3.2.2 The economic conditions under which fishing industries operate promote responsible fisheries;

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

3.2.4 Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected;

3.2.5 Depleted stocks are allowed to recover or, where appropriate, are actively restored;

3.2.6 Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected; and

3.2.7 Pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.

FAO Main Criteria 7.2.2 Other 7.6.10

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
3.2.1	Refer to clause 9.1 on maintaining fishing capacity at suitable levels and clause 9.1.1 on mechanisms to reduce capacity. "The Alaska Commercial Fisheries Entry Commission (CFEC) helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers" http://www.cfec.state.ak.us/. Entry into each regional salmon fishery is limited by the Commission to permitted harvesters, the number of permits is regulated taking into account economic viability of each fishery (Alaska Statutes Title 16 Chapter 16.43 Regulation of Entry into Alaska Commercial Fisheries; Title 20 Alaska Administrative Code, Chapter 05 Commercial Fisheries Entry Commission). Historically the CFEC, a separate agency from ADFG, considered the average catch in a Region and its economic value and the historical number of fishermen in deciding the number of permits to be established in the region, e.g. the number of drift gill net permits that were issued in Prince William Sound was 585 in the first year of entry limitation, 1975 (see http://www.cfec.state.ak.us/bit/X_S03E.HTM). The permits, originally awarded to participants in the fishery by the state, subsequently traded on the open market. The

	Prince William Sound drift gill net permits have ranged in value from $15 thousand to $160 thousand (see: http://www.cfec.state.ak.us/bit/X_S03E.HTM). CFEC continuously monitors the economic health of fisheries (see: http://www.cfec.state.ak.us/fishery_statistics/earnings.htm). Exploitation remains economically viable: 1) Through the conservation and protection of the reproductive capacity of the stocks by the inseason management of harvest by ADFG, under their management plans (see clause 3.1). 2) Through the allocation of harvest among various user groups by the periodic actions of the BoF (see clause 3.1). 4) Through limitations on vessel and gear size (see clause 9.1.1). 5) Through the response of the individual permit-holder fishermen to the market in their choice of whether or not to exercise their permit in a given season. For instance, in the Southeast Alaska seine fishery after the years in which the entry limitation program developed in the 1970s, the number of permits issued stabilized at 420 in the early 1980s, of which over 350 were fished each year. Even though annual catches remained high, in response to declining market value of salmon by the 2000s as few as 212 permits were fished in a given year. During that time average gross earnings of permit holders ranged from $60 thousand in 1987 to $250 thousand in 1989 and the market value of the permits themselves ranged from $111 thousand in 1990 to $32 thousand in 2004. See: http://www.cfec.state.ak.us/bit/X_S01A.HTM. 6) Through permit 'buy-back', a mechanism to reduce the number of permits in a fishery so as to enhance the economic viability of the fishery (see clause 9.1.1). This provision has been exercised in one on-going instance: The Southeast Revitalization Association was formed in 2008 under the authority of law (AS 16.40.250) and with a federally underwritten loan fund to reduce the number of permits. Thirty Five permits were initially bought-back by the fund, the number of seine permits in Southeast Alaska dropped from 415 (237 actually fished) in 2007 to 380 (212 actually fished) in 2008 and the average market price of permits increased from $59,700 in 2007 to $72,800 in 2009 (see: http://www.cfec.state.ak.us/bit/X_S01A.HTM).
3.2.2	**3.2.2 The economic conditions under which fishing industries operate promote responsible fisheries;** The economic value of the salmon harvest declined during the 1990s as a result of international market forces. However, there was no tendency toward increasing harvest above that which would permit adequate escapement for conservation during this period and evidence demonstrates that the BoF and ADFG made continuing progress in establishing biologically based escapement goals for salmon stocks and in improving methods of stock assessment. The limited entry permitting process of the CFEC and the separation of allocative and conservation responsibilities of the BoF and ADFG combine to promote responsible fisheries, even during economic hardship. However, the BoF process does support reviews proposals to alter fisheries management plans so as to improve the economic efficiency and is designed in a manner that conserves the biological resource.

3.2.3	**The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries, are taken into account;** The interest of small-scale harvesters is protected in Law, Regulation and Policy. The fishing power of individual harvesters is limited by state regulation of vessel and gear size, e.g. AS 16,05.835. Entry permits (see 3.2.1 above) are limited generally to one per harvester and the participating vessel is operated by the permitted harvester. The effect is to constrain participation in each fishery to 'family scale' artisanal units. The interests of all harvesters are protected through the BoF process. The BoF receives recommendations from 82 local Advisory Committees in communities around Alaska. They develop regulation proposals, evaluate proposals, debate conservation, advise regional councils and consult with interested parties (http://www.boards.adfg.state.ak.us/advisory/index.php). Subsistence uses (http://www.adfg.state.ak.us/special/special_fisheries/subsistence.php) are given preference in law over other uses in fishery management (AS 16.05.258). On all Federal public lands and waters management of subsistence fisheries is the responsibility of the Federal Government which ensures that preference is given to subsistence users. In 'nonsubsistence areas' of Alaska 'personal use' fisheries provide harvest opportunities other than by sport fishing methods (rod & reel). The Subsistence Division of ADFG supports the interests of subsistence harvesters.
3.2.4	**Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected;** Conservation of the biodiversity of aquatic habitats and ecosystems is the responsibility of Habitat Division within ADFG (AS 16.05.871, AS 16.05.841.) (http://www.habitat.adfg.alaska.gov/overview.php). 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. Sport Fish Division maintains and updates the anadromous stream catalog which lists all waters used by salmon for spawning, rearing, and travel. Anadromous streams receive increased protection from development. The Commercial Fisheries Division maintains a Gene Conservation Laboratory (http://www.cf.adfg.state.ak.us/geninfo/research/genetics/mission.php) which advises the Division Director in enforcing the Finfish Genetics Policy, which has as its purpose protection of the genetic diversity of salmon and other fish. The Laboratory reviews and recommends actions on applications for Hatchery Operating Permits, Fish Resource Permits which are required for any collection of fish, shellfish, or plants (e.g. for scientific research), and for Fish Transport Permits which are required for transportation, possession, or release of live fish (e.g. by a hatchery or for scientific research). The Commercial Fisheries Division maintains a Fish Pathology Laboratory which has an important role in ecosystem conservation. It "monitors and controls finfish and shellfish diseases...conducting diagnostic surveys, developing...policies...on fish disease issues"

(http://www.cf.adfg.state.ak.us/geninfo/research/patho/pathohpg.php). The Laboratory also reviews and recommends actions on applications for Fish Resource Permits or Fish Transport Permits. The Laboratory has responsibility for policies designed to protect habitats and ecosystems from the introduction or amplification of fish pathogens.

The Commercial Fisheries Division maintains a Mark Tag and Age Laboratory "to provide fisheries managers and researchers with timely, current, and historical biological data to help them manage, preserve, protect, and perpetuate Alaska's fishery resources" (http://tagotoweb.adfg.state.ak.us/). The Laboratory's role in ecosystem conservation is important in that it enables harvest managers to know the portion of wild salmon in mixed harvests with hatchery-produced salmon and thus enables accomplishment of policies for mixed stock fisheries, sustainable fisheries, and escapement goal setting (see 3.1 above).

Few or no species are classified as endangered or threatened under US law. The southeast troll fishery is estimated to take a small number of Chinook salmon belonging to threatened or endangered stocks from the Columbia River. Those takes are regulated under treaty with Canada by the 1999 Pacific Salmon Agreement (see http://www.psc.org/). Under the treaty an annual quota of Chinook salmon is set for the Alaska fishery, a quota designed to conserve all wild stocks of Chinook salmon. The management of the troll fishery (through inseason opening and closure of the fishery) is governed by that annual quota. The harvest of different stocks each year is estimated from the recovery rates of coded wire tags implanted in representative index stocks in the region of the threatened or endangered stocks described at http://www.psc.org/info_codedwiretagreview.htm & http://tagotoweb.adfg.state.ak.us/.

The International Union for the Conservation of Nature (IUCN), Salmonid Specialist Group has recently (2008) assessed the 'Red List' status of sockeye salmon including populations in Alaska (see http://www.stateofthesalmon.org/IUCN/). IUCN characterizes populations as Critically Endangered, Endangered, Vulnerable, Least Concern or Near Threatened, different terms from those used under US law, the Endangered Species Act. Eight populations in Alaska were characterized as 'Least Concern' and 10 as 'Data Deficient'.

One Alaska population (Alaska Coastal Downwelling Eastern Gulf of Alaska) was categorized as 'Vulnerable' under criterion A2a because "The rate of change applied to this subpopulation, assessed over six sites [during 1990 -2005] is -46%" (http://www.iucnredlist.org/apps/redlist/details/135322/0). ADFG has established escapement goals for three stocks within the IUCN-established boundaries of the population (Redoubt, Situk, East Alsek-Doame) and monitors them annually; none has been identified as a stock of concern. Redoubt has met escapement goals in recent years (2008, 09, 10; recent data are from a Personal Communication, Bill Davidson, Regional Management Biologist, Southeast Region, ADFG, 2 Feb 2010). 2008 was a year of widespread low abundance of sockeye in Southeast Alaska. The East Alsek-Doame stock escapement was short of its goal in 2008, 2009 but met the goal in 2010; the Situk stock escapement was short of its goal in 2008 but exceeded its goal in 2009, 2010. None of these stocks is identified under Alaska's management system as a stock of concern because they have not been chronically under escapement goals.

One Alaska Population was characterized as 'Endangered' by IUCN. Nass Skeena Hugh (http://www.iucnredlist.org/apps/redlist/details/135328/0) includes one stock for which

	ADFG has established escapement goals and for which it maintains annual censuses by weir count. After a period of five years in which escapements were below the established goal for McDonald Lake stock, it was identified as a stock of concern in 2009 and an Action Plan in which fisheries are restricted has been put in place. McDonald Lake escapement was short of its goal in 2008, 2009 but met its goal in 2010; the trend of declining escapement which led to the IUCN red list assessment of 'Endangered' has been stopped, McDonald Lake escapement is no longer declining (personal communication, Steve Heinl, Regional Salmon Research Supervisor, ADFG, 4 Feb 2010). One Alaska/BC transboundary population, Nass Skeen North, was characterized as Endangered (http://www.iucnredlist.org/apps/redlist/details/135352/0). No stock for which ADFG has established escapement goals is in this population.
3.2.5	**3.2.5 Depleted stocks are allowed to recover or, where appropriate, are actively restored;** Recovery of depleted stocks is an active policy of the state, recognizing that from time to time stocks become depleted through natural variation or accidents of harvest. Management plans are based on providing adequate 'escapement' or spawning stock in each generation. The BoF's 'Mixed Stock Policy' provides for the restriction of fisheries on stocks "where there are known conservation problems" (see 3.1 above). The BoF's 'Policy for the Management of Sustainable Salmon Fisheries' requires that "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" (see 3.1 above). History demonstrates that ADFG enforces this policy rigorously by curtailing fisheries on depleted stocks, for example harvests, including subsistence, have been severely curtailed or eliminated in several recent years for Chinook and chum salmon in the Arctic Yukon Kuskokwim region (refer to Commercial Fisheries Division Memorandum AYK Stock of Concern Recommendations dated Sept 22, 2009). Examples of Chinook salmon stocks in recovery state include those running into the Stikine and Taku rivers. The 2011 pre-season terminal run forecast for large Stikine River king salmon is 30,000 fish. The resulting U.S. Allowable Catch (AC) is 190 large Stikine kings. An AC of this size will not allow for directed commercial fisheries to occur in early May. An in-season terminal run estimate will be produced in late May. If the first in-season estimate is significantly greater than the pre-season forecast, limited directed king salmon fishing could occur. The 2010 pre-season terminal run forecast for large Stikine River king salmon was 23,000 fish and terminal run of this size resulted in no U.S. Allowable Catch (AC) of large Stikine kings. The 2011 forecast is the third consecutive Stikine River king salmon pre-season terminal run forecast in the past six seasons that does not allow for directed commercial fisheries. The 2011 pre-season terminal run forecast for large Taku River king salmon is 41,000 fish. A terminal run of this size yields a U.S. Allowable Catch of 1,533 large Taku king salmon. Given the relatively small Allowed Catch and taking into consideration forecast confidence intervals, directed Chinook commercial troll and gillnet fisheries in District 11 will not open unless an in-season terminal run estimate produced in late May, provides sufficient

	allowed catch for manageable fisheries to be prosecuted. The 2010 pre-season terminal run forecast for large Taku River king salmon was 41,328 fish yielding a U.S. Allowable Catch of 1,781 large Taku king salmon. The 2011 season would be the fifth season the preseason forecast provides allowed catch for directed fisheries on returning Taku River king salmon since these fisheries were reestablished in 2005. **Sources:** http://dungie.adfg.state.ak.us/AdfgDocument.po?DOCUMENT=22853 http://dungie.adfg.state.ak.us/AdfgDocument.po?DOCUMENT=21665
3.2.6	**Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected; and** See 3.2.4 above Responsible agencies are ADFG for fishery resources through the Commercial, Sport and Subsistence Divisions. The BoF through AP recommendations and the Habitats Division of ADFG also play a role in managing the impact on fishery resources from human activities. Habitats Division also plays a role. For resource impacts outside of the 3mile limit, the Federal agencies, NMFS and NPFMC work towards the protection of salmon resources from human impacts caused by fishing.
3.2.7	**pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.** Salmon fishing gear (purse seine, drift gill net, set gill net, troll) has been refined through long practice to harvest salmon efficiently and as exclusively as possible. Bycatch of non-targeted species is not a major issue in most Alaska salmon fisheries. Most non-targeted fish harvested in salmon fisheries are other species of salmon and are reported on fish tickets. Lost gear in Alaska salmon fisheries is a virtually non-existent problem as purse seiners, trollers and gillnetters (set/driftnets) operate with near surface or floating gear securely connected to the boat or shore. Salmon fisheries occur in coastal waters near natal rivers for each stock in areas defined by the various management plans (see 3.1 above) thus stocks and species are geographically segregated when they are exposed to harvest. ADFG further separates harvests of different species and stocks by time and area closures during each season. The take of different species and stocks in each fishery is closely monitored by ADFG managers during the season in various catch-sampling programs and through the fish ticket system through which all landings (apart from personal use that cannot be sold or bartered) are reported to ADFG**.** Fish retained for personal use represent a small portion of the total commercial catch, but because these fish are not sold, they are not necessarily reported on fish tickets. Regulations requiring reporting of all salmon or certain species of salmon retained for personal use exist in all or parts of seven management areas (Norton Sound 5AAC 04.365(b); Yukon-Northern 5AAC 05.377; Bristol Bay 5AAC 06.377; Chignik 5AAC

	15.355(b); Kodiak 5AAC 18.355; Cook Inlet 5AAC 21.355; and Prince William Sound 5AAC 24.356). Routine reporting of retained catch, or discarded catch, is not required in the other management areas, but retention of all fish caught or reporting may be required as a condition of a specific fishery management plan, or retention and/or reporting of retained fish may be required by emergency order. A statewide regulation also requires reporting of all steelhead (*Oncorhynchus mykiss*) retained for personal use (5AAC 39.010(b)). However, in the Southeast and Yakutat areas this steelhead reporting requirement is only in effect when implemented by emergency order (SE 5AAC 33.395; Yakutat 5AAC 30.395). Alaska salmon, primarily juvenile Chinook and chum salmon, are caught in Alaska groundfish fisheries. In Alaskan waters, groundfish operators are required to keep on board, or at the shoreside processing plant, all salmon harvested as bycatch in trawl fisheries so that they may be sampled by agency personnel (5AAC 39.166). Salmon bycatch in trawl fisheries for walleye pollock in the Bering Sea and Gulf of Alaska are monitored by NMFS with an onboard observer program (Witherell *et al.*, 2002). In 2010 the NMFS issued a record of decision (ROD) on the environmental impact of the Bering Sea Pollock trawl fishery on Chinook salmon http://www.fakr.noaa.gov/sustainablefisheries/bycatch/salmon/chinook/feis/amd91rod_0510.pdf). This ROD found that up to 95% of the Chinook salmon bycatch from the Bering Sea and Aleutians ground fish fisheries occurs in the Bering Sea Pollock fishery and catch limits and incentives to reduce bycatch were recommended. These have since been implemented in 2010 under Amendment 91 to the Fishery Management Plan for Groundfish in the BSAI. An Environmental Impact Statement (EIS) for non-Chinook bycatch (made up primarily of chum salmon) is currently being performed by the NMFS (see Chum salmon bycatch discussion paper http://www.fakr.noaa.gov/npfmc/current_issues/bycatch/chumbycatch1208.pdf). A significant portion of the chum salmon (20-34%) and Chinook salmon (56%) bycatch from trawl fisheries are fish that originate from western Alaska. ADFG has implemented significant restrictions on chum and Chinook salmon fisheries in areas of western Alaska in response to declining returns, and reducing the trawl bycatch is part of the planned effort to help restore these stocks. Alaska law prohibits “wanton waste”, such as the discarding of salmon by salmon harvesters (AS 16.05.831, SF 75.065) http://law.justia.com/alaska/codes/2009/title-16/chapter-16-30/sec-16-30-010/.

B. Science and Stock assessment activities

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

FAO 7.1.9/7.4.4/7.4.5/7.4.6/8.4.3/12.4

ECO 29.1

Confidence Ratings	Low	None	Medium	None	High	5 out of 5

Clause:

4.1 Reliable and accurate data required to assess the status of fisheries and ecosystems – including data on retained catch of fish, bycatch, discards and waste must be collected.

4.1.1 These data must be collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery.

FAO Criteria 7.4.6 Others 12.4/29

4.1.2 Timely and reliable statistics must be compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment.

FAO Criteria 7.4.4

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
4.1	Salmon are harvested in commercial, sport, personal use, and subsistence fisheries. Despite the vast majority of the harvest takes place in commercial fisheries, the State recognizes the necessity of accounting for all removals and has developed methods for documenting the amount of harvest and characteristics of fish harvested in all salmon fisheries. **Fishery Dependant Sampling Harvest and Catch Sampling.** **Commercial Fisheries Harvest:** The primary method of accounting for commercial fishery harvest is the ADFG's fish ticket system. By Alaska law (AS 16.05.690 Record of purchase) each buyer of fish is required to keep a record of each purchase showing the name or number of the vessel from which the catch is taken, the date of landing, vessel license number, pounds purchased of each species, number of each species, and the ADFG statistical area in which the fish were taken, as well as other information ADFG may require for specific fisheries or areas. The primary responsibility for filling out and submitting a fish ticket lies with the fish buyer, and they may not knowingly submit a false or inaccurate fish ticket. The seller of the fish (fisherman) is also legally responsible to ensure that the information they provide on a fish ticket is accurate. ADFG distributes fish ticket books upon request to all permitted or licensed buyers/processors/sellers of fish in

Alaska. Fish tickets are filled out by the processor each time they receive a delivery from a commercial fisherman and a copy is provided to ADFG within 7 days of the sale. Currently, ten different types of fish ticket forms are used by ADFG based on fishery or species harvested (http://www.cf.adfg.state.ak.us/geninfo/permits/cfscodes_fishtickets.php). In some cases, the delay in receiving fish ticket information is too long for effective management. In these cases ADFG may require timelier reporting. For example, salmon processors in Yukon River fishing districts must verbally report their salmon purchases within 18 hours of the closure of a commercial fishing period (Hayes and Norris 2010).

Although non commercial catches are not included in certification, the assessment has reviewed the reporting systems for sports and subsistence fisheries in the evaluation of consistency with respect to overall fisheries management.

Sport Fisheries Harvest: The estimated harvest from the sport fishery is obtained in three primary ways. The statewide harvest survey is an annual postal survey conducted since 1977 that is sent to a percentage of all sport license holders. Respondents provide estimates of the number of each species of fish they harvested, fish they released, where they fished, and the number of days fished. These data are expanded to provide estimates of harvest, catch, and man-days of fishing effort for all species in all areas of Alaska. Copies of the historic Statewide Harvest Survey reports can be found on ADFG website http://www.sf.adfg.state.ak.us/statewide/FishingSurvey/index.cfm?FA=main.historic and harvest, catch and effort data for 1996-2009 are available online at http://www.sf.adfg.state.ak.us/statewide/FishingSurvey/.

The primary disadvantage of this type of information is that the estimates are not finalized until approximately a year after the harvest took place. To obtain more timely estimates, the Sport Fish Division conducts creel censuses on important fisheries such as the SE marine sport fishery (Hubartt and Jaenicke 2004) and the Kenai River sport fishery (Eseklin 2010). Onsite creel censuses are also used to validate the accuracy of the Statewide Harvest Survey Estimates (Clark 2009). The third type of Sport Fishery harvest and effort data is provided via a logbook program required of all guides and charter operators. All freshwater and saltwater guides must register with the Division of Sport Fish each year. Each registered guide/charter operator must report information about his clients, time spent fishing, areas fished, and harvest and catch of all species. Logbooks must be completed before offloading any fish and completed forms must be returned to ADFG for processing every week. A summary of the logbook program including participation and harvest estimates for the logbook program can be found in Sigurdsson and Powers (2009). In a report to the NPFMC, ADFG attempted to verify logbook estimates by comparing them to harvest estimates from the Statewide *Harvest* Survey (SWHS), onsite creel censuses, a post season survey of guides, and individual comparisons of logbook entries with specific guides that were interviewed during creel surveys (Meyer *et al.*, 2008). In general it appears that logbook estimates are reliable, especially when individual onsite interview are compared with the corresponding logbook entry. The largest discrepancies occurred between logbook and SWHS estimates of halibut harvest. ADFG continues to develop methods to improve the accuracy of logbook reporting procedures (Sigurdsson and Powers

2009).

Subsistence and Personal Use Harvest: Most state managed subsistence fisheries are managed by the Commercial fisheries Division and most personal use fisheries are managed by the Sport Fish Division (http://www.adfg.state.ak.us/special/special_fisheries/pers_subsist_home.php). Most subsistence and personal use fisheries require a permit to participate (http://www.adfg.state.ak.us/special/special_fisheries/personal_use.php; http://www.adfg.state.ak.us/special/special_fisheries/subsistence.php).

Regulations including legal gear, locations, times, and maximum harvest levels vary by area and fishery and are specified in regulation or on subsistence and personal use permit permits. In most areas the number of fish harvested for personal use and subsistence must be reported on the permit and the permit returned to ADFG at the end of the season. In cases where the subsistence harvest represents a significant portion of the total harvest or when dealing with a particular management issue, subsistence fishermen may be required to report their harvest at intervals during the season or subsistence harvest data may be verified using post or inseason surveys of subsistence or personal use fishermen (Hayes and Norris 2010). Subsistence harvest information by fishery is usually reported in commercial fishery annual management reports (for example Morstad *et al.*, 2010).

Bycatch Discards and Waste: Alaska commercial fishermen may also retain all or a portion of their bycatch for their own use (5AAC 39.010(a)). These fish may not be sold or bartered. Fish retained for personal use represent a small portion of the total commercial catch, but because these fish are not sold, they are not necessarily reported on fish tickets. In some management areas, there are regulations requiring reporting on fish tickets the number of fish retained for personal use, however these regulations are not consistent across management areas. For example, regulations requiring reporting of all salmon or certain species of salmon retained for personal use exist in all or parts of seven management areas (Norton Sound 5AAC 04.365(b); Yukon-Northern 5AAC 05.377; Bristol Bay 5AAC 06.377; Chignik 5AAC 15.355(b); Kodiak 5AAC 18.355; Cook Inlet 5AAC 21.355; and Prince William Sound 5AAC 24.356). Routine reporting of retained catch, or discarded catch, is not required in the other management areas, but retention of all fish caught or reporting may be required as a condition of a specific fishery management plan, or retention and/or reporting of retained fish may be required by emergency order. A statewide regulation also requires reporting of all steelhead (*Oncorhynchus mykiss*) retained for personal use (5AAC 39.010(b)). However, in the Southeast and Yakutat areas this steelhead reporting requirement is only in effect when implemented by emergency order (SE 5AAC 33.395; Yakutat 5AAC 30.395). As stated previously, the number of fish taken in commercial fisheries that are retained for personal use is undoubtedly small, but it is unclear why reporting of these fish is not routinely required on fish tickets.

Bycatch of non-targeted species is not a major issue in most Alaska salmon fisheries. Most non-targeted fish harvested in salmon fisheries are other species of salmon and are reported on fish tickets. Alaska fishing regulations, management plans, and inseason management actions are often specifically designed to minimize the harvest of non-targeted salmon species. For example, the upper Cook Inlet gillnet fishery targets sockeye,

pink, and chum salmon, but coho salmon are also caught, sold, and reported on fish tickets. The Cook Inlet Northern District Salmon Management Plan (5AAC 21.358) provides a series of regulatory measures to minimize harvest of coho salmon bound for the northern district of upper Cook Inlet.

Alaska salmon, primarily juvenile Chinook and chum salmon, are caught in Alaska groundfish fisheries. In Alaskan waters, groundfish operators are required to keep on board, or at the shoreside processing plant, all salmon harvested as bycatch in trawl fisheries so that they may be sampled by agency personnel (5AAC 39.166). Salmon bycatch in trawl fisheries for walleye pollock in the Bering Sea and Gulf of Alaska are monitored by NMFS with an onboard observer program (Witherell *et al.*, 2002). In 2010 the NMFS issued a record of decision (ROD) on the environmental impact of the Bering Sea Pollock trawl fishery on Chinook salmon. (http://www.fakr.noaa.gov/sustainablefisheries/bycatch/salmon/chinook/feis/amd91rod_0510.pdf). This ROD found that up to 95% of the Chinook salmon bycatch from the Bering Sea and Aleutians ground fish fisheries occurs in the Bering Sea Pollock fishery and catch limits and incentives to reduce bycatch were recommended. These have since been implemented in 2010 under Amendment 91 to the Fishery Management Plan for Groundfish in the BSAI. An EIS for non-Chinook bycatch (made up primarily of chum salmon) is currently being performed by the NMFS (see Chum salmon bycatch discussion paper, http://www.fakr.noaa.gov/npfmc/current_issues/bycatch/chumbycatch1208.pdf). A significant portion of the chum salmon (20-34%) and Chinook salmon (56%) bycatch from trawl fisheries are fish that originate from western Alaska. ADFG has implemented significant restrictions on chum and Chinook salmon fisheries in areas of western Alaska in response to declining returns, and reducing the trawl bycatch is part of the planned effort to help restore these stocks. These management decision activities were witnessed first-hand by the Assessment Team during the attendance at the NPFMC Dec 6-14th meeting cycle in Anchorage, AK. Table 5.2 provides a summary of the discussions and outcome on the meetings with reference to the GoA Chinook bycatch (refer also to Chinook Salmon Bycatch in Gulf of Alaska Groundfish Fisheries, November 2010; Agenda C-5.

Catch Sampling (All Fisheries): While fish tickets, subsistence and personal use permits, creel surveys and logbooks provide accurate and comprehensive information on the number of each salmon species caught by fishery and area, they do not provide information on other characteristics of the catch. To obtain more detailed information on the composition of the catch (such as age, sex, and size information) as well as to recover tags, estimate fishery performance information, and obtain parasite and genetics samples, ADFG routinely samples fish caught in commercial and sport fishery and to a lesser extent subsistence and personal use fisheries. These types of catch data are used in numerous ways to make management decisions as well as to identify specific stocks within the catch, estimate the proportion of hatchery fish in the catch, estimate various population dynamics rates, and set escapement goals and other management targets.

The level and types of additional catch sampling vary depending on the needs of the specific fisheries and are documented in management plans, management reports, or

catch sampling reports. For example, the SE Alaska regional catch sampling project obtains biological samples from troll, seine, and gillnet fisheries at all major processors in the region (Geiger 2003). The fisheries for Chinook salmon are regulated under an abundance-based quota established in the US/Canada Pacific Salmon Treaty process. During the catch sampling process, commercial trollers are interviewed to obtain catch-per-unit-effort information. These data, in conjunction with aerial counts of the number of boats participating in the fishery, are used to obtain inseason estimates of the total harvest of Chinook salmon in the troll fishery. Managers use this information to establish the length of future retention periods for Chinook salmon to ensure that the total harvest quota is not exceeded. A similar process occurs in the sport fishery using catch sampling data and catch and effort data obtained from the regional creel survey project (Frenette *et al.*, 2009). The SE commercial catch sampling program also estimates the proportion of hatchery Chinook in the catch (through recovery of hatchery fish marked with coded wire tags), and this information is used to direct fishing effort into areas of higher hatchery abundance as mandated in the Spring Troll Fishery Management Plan (5AAC 29.090).

Fishery Independent Data

Test Fishing: The test fishery program is a relatively small but integral part of the state's overall management program for salmon. It provides up-to-the-minute information needed to make fishery management decisions; information that is not always available from catch sampling or other assessment methods. Test fisheries often provide validation for preseason management predictions, information about the timing of specific runs, fish size and quality information, and information about stock of origin of the fish likely to be harvested in the commercial fishery.

Test Fisheries information is often similar to that which is obtained by commercial fishery catch sampling, but without having to conduct a full-scale commercial fishery. Over the years ADFG has conducted numerous test fisheries, but the number and duration of the fisheries, the number of fish sampled, and the type of test fisheries that are performed vary depending on the specific management needs. Test fishery techniques, results, and the rationale for management decision that were made based on the test fishery are documented in management plans and reports (available on the ADFG web site). As an example, the Chignik Area Salmon Management Plan (5AAC 15.357) requires that the fishery remains closed until 20,000 sockeye salmon have passed the Chignik River weir. However, the plan allows ADFG to open fisheries early if it determines that a large enough number of sockeye salmon have built up in the Chignik Lagoon to meet escapement goals. ADFG conducts test fisheries in the lagoon to assess sockeye abundance and opens commercial and subsistence fisheries based on the results of the test fisheries (Anderson 2010). This test fishery is conducted by local seiners under contract with ADFG. The test fishing procedures are described in the salmon operational plans for the Chignik area (Anderson *et. al* 2010).

Stock Assessment: ADFG personnel (primarily Commercial Fishery Division and Sport Fish

	Division) conduct a wide range of stock assessment projects each year. These projects provide the stock status information necessary to effectively manage commercial, sport, subsistence, and personal use fisheries. For salmon, the most common stock assessment need is to determine escapement (the number of salmon escaping the fisheries to spawn). Maintaining adequate numbers and quality of spawning fish is the primary method used to ensure sustainable yield from Alaska's salmon fisheries. Various techniques are used to measure escapement including: counting towers, weirs, aerial and foot surveys, sonar, and mark-recapture abundance estimates. These escapement enumeration projects are documented in fisheries data and management reports. In addition to escapement counts, ADFG collects numerous other stock assessment information such as age composition of the run (usually obtained from scale samples or otoliths), population dynamics estimates (such as survival, mortality, recruitment, and growth rates), stock identity information (from scale pattern analysis, tagging and tag recovery programs, genetic stock identification, and analysis of parasites that occur in specific stocks), and environmental data such as water quality and quantity, extent of riparian habitat, and the effects of habitat alteration of salmon habitat. Sample sizes needed for age, sex, and size analysis varies by species and fishery. Study plans and reports document the steps taken to obtain unbiased samples and the statistical rationale for the sample size. For example, in their catch sampling operational plan, Murphy and Tsersich (2004) require a weekly sampling goal of 400 sockeye salmon for age, sex, and length for each of their sampling sites in the Alaska Peninsula management area. They state that this level of sampling will permit each age class proportion estimate to be within 0.075 of the true proportion with 90% confidence. Escapement counts, along with age composition, and harvest information are used to develop brood tables of total production from an individual year class. These types of data, collected over several years, are used to estimate the level of spawning escapement that will result in future production, and ultimately, formulation of Biological Escapement Goals (BEG). Sufficient information is not always available to establish a BEG. In these cases management goals are established that require less comprehensive data sets. A Sustainable Escapement Goal (SEG) is the level of past escapement (as demonstrated by escapement counts or indices) that has resulted in sustainable yield over a 5-10 year period. A Sustainable Escapement Threshold (SET) is the minimum level of historic escapement that has allowed a stock to replace itself. An Optimum Escapement Goal (OEG) is a specific management objective for salmon escapement that considers biological and allocative factors. An OEG may differ from a BEG or SEG, but the lower bound of an OEG will always be above the SET. Establishing escapement goals and developing stock assessment and management systems to achieve the goals forms the basis of Alaska's management program for salmon.
4.1.1	**These data must be collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery.** Since statehood, as management expertise has been developed, Alaska has been subdivided into specific regions, management areas, fishing districts, subdistricts, and individual fish stocks or aggregates of fish stocks for management purposes (http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/maps/map_home.php/). The

	fishery and stock status information necessary to manage individual stocks and stock aggregates is collected each year in an efficient and timely manner. Those data that are needed for inseason management receive the highest priority for sampling and analysis. Other data that are needed for future analysis of escapement goals, projections of future returns, or other non-time sensitive purposes usually are analyzed during the fall and winter, after the fisheries have taken place.
4.1.2	**Timely and reliable statistics must be compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment.** The Division of Commercial Fisheries Computer Services section maintains the fish ticket computer software and archives the fish ticket data, most of the data entry of the fish ticket information is performed by Commercial Fisheries Division area or regional staff (Whitmore *et al.*, 2008). Fish ticket catch information is obtained, processed, and analyzed by ADFG in an efficient manner and is available to managers when necessary when making management decisions. Commercial catch estimates, both inseason and historic, are readily available on the Commercial Fisheries website (http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmcatch.php) and in area management reports. For sport fisheries, statewide estimates of harvest (the statewide harvest survey and guide logbook programs) are administered by the Research and Technical Services section located in Anchorage. Estimates from individual projects, such as creel censuses, are reported in project reports, BoF reports and area management reports. Sport fishery harvest and fishing effort estimates obtained from the statewide harvest survey are available on the Sport Fish website: http://www.sf.adfg.state.ak.us/statewide/FishingSurvey/.

Clause:

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

FAO Criteria 8.4.3

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
4.2	Alaska generally does not require onboard observers for salmon fisheries. However, sampling programs are implemented that allow managers to observe and sample the catch from all fisheries when needed. Alaska Law (16.05.055 and 16.05.251(13) provides the ability for the BoF to require observers on board of vessels registered to fish in Alaska. Onboard observer projects are usually applied to fisheries were a large component of the vessels, such as catcher/processors and floating processors, rarely or never enter Alaska ports (5AAC 39.141; 39.142; 39.143; 39.144; and 39.146). Virtually all Alaska's commercial salmon fisheries and all sport, subsistence, and personal use fisheries occur close to shore and fish that are harvested are returned to Alaskan ports where they are recorded on fish tickets and may be sampled by ADFG personnel. Additionally, ADFG (as well as Department of Public Safety) personnel periodically observe the fisheries and may conduct sampling and regulatory enforcement activities on vessels while actively fishing. State regulation 5AAC; 39.140 (Inspection of fishing establishments and vessels), provides ADFG and Department of Public Safety personnel with the free and unobstructed access to all fishing vessels and processing establishments (floating or land-based) to inspect catch, gear, and compliance with Alaska laws and regulations. Alaskan catch sampling and creel programs (described under 4.1 of this section) collect accurate data from fishermen and processors during onsite interviews for research purposes and to support compliance with regulations. For these reasons, onboard observers are rarely required for Alaskan salmon fisheries.

Clause:

4.3 Sufficient knowledge of social, economic and institutional factors relevant to the fishery in question must be developed through data gathering, analysis and research.

FAO Criteria 7.4.5

Evidence adequacy rating

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
4.3	The Policy for the Management of Sustainable Salmon Fisheries (5AAC 39.222(c)(5)) mandates a "precautionary approach" to salmon fisheries management that involves consideration of the uncertainties in salmon fisheries and habitat management; biological, **social,** cultural, and **economic** risks; and consideration of the needs of future generations. ADFG area biologists attempt to meet this need by attending all gear group, processor, and community meetings necessary to keep abreast of the various factors affecting

Alaska's fisheries. Processor capacity can have a significant economic impact on commercial fisheries. To assess this capacity, ADFG conducts an annual survey of processor capacity (5AAC 39.132. Annual statistical survey of processor capacity). To further track processor capacity, regulations for management areas generally require that processors register with the area prior to beginning operations. ADFG also employs staff economists and social scientists that are responsible for conducting or contracting studies related to Alaska's fisheries and its users. Examples of socio-economic information conducted or funded by the state can be found in (Wolfe *et al.*, 1983) for subsistence fisheries, (Southwick *et al.*, 2008) for sport fisheries, and (McDowell Group 2006) for commercial fisheries.

These types of social and economic information are specifically required when the BoF makes decisions about the allocation of fishery resources between various user groups. By regulation, the BoF must consider the following allocation criteria (AS 16.05.251(17)(e):

1. The history of each personal use, sport, guided sport, and commercial fishery;
2. The number of residents and non-residents who have participated in each fishery in the past and the number of residents and non-residents who can reasonably be expected to participate in the future;
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; and
7. The importance of each fishery in providing recreational opportunities for residents and non-residents.

The BoF must also determine which areas of the state are not open to subsistence hunting and fishing. A nonsubsistence area is defined as an area or community where dependence on subsistence is not a primary characteristic of the economy, culture, and way of life of the area or community. The BoF must consider 13 socio-economic and cultural factors when making these nonsubsistence determinations (AS 16.05.258).

Answers to these socio-economic and cultural questions concerning allocation and subsistence areas are routinely provided to the BoF by ADFG, fishing gear group representatives, and representatives of local Fish and Game Advisory Committees. As noted in previous sections, advisory committees are composed of interested citizens (most of whom are active hunters, trappers, or participants in commercial, sport, subsistence or personal use fisheries). There are 82 advisory committees located throughout the state, and their primary purpose is to provide local knowledge to the BoF about issues relating to the management of fish and wildlife resources (5AAC 96.010). This process brings knowledge of social, economic and institutional factors to the attention of management.

Article VIII Section 15 of the Alaska Constitution stipulated that no "exclusive right or special privilege" could be created or authorized for Alaska's fisheries. In 1973 the

	Constitution was amended as follows: "*This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State."* The Commercial Fisheries Entry Commission (CFEC) was established to reduce participation in commercial fisheries to ensure that individual fishermen receive adequate remuneration and to conserve the fishery resources. Evaluation of participation by individuals and their economic dependence on the fishery were critical elements in determining who would receive a limited entry permit. CFEC annually estimates the price paid and value of fish harvested in each fishery as well as the value of each type of limited entry permit.

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

FAO 7.2.1/7.4.2/12.2/12.3/12.5/12.6/12.7/12.17

Confidence Ratings	Low	None	Medium	None	High	9 out of 9

Clause: 5.1 An appropriate institutional framework must be established to determine the applied research which is required and its proper use for fishery management purposes.

FAO Main Criteria 12.2 Others 12.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
5.1	Alaska salmon resources are abundant, but they vary considerably by area and species, as do the fisheries that harvest the resource. Assessment of the status of this large and widespread resource and to implement appropriate management measures has often been described as a major task. Over time, and as management expertise has been developed, Alaska has been subdivided into specific regions, management areas, fishing districts, subdistricts, and individual fish stocks or aggregates of fish stocks for management purposes. The two primary divisions of ADFG that manage Alaskan salmon fisheries are the Commercial Fisheries Division (responsible for all commercial and subsistence fisheries management, and some personal use fisheries management) and the Sport Fish Division (responsible for all sport and guided sport fishery management, and most personal use fisheries management). ADFG Commercial Fisheries Division offices are situated in 23 locations throughout the range of commercial salmon fisheries. Institutional framework for fisheries management includes supervisory, administrative, technical, economic, biometric, research, and management staff. These staff are located within each management division as well as within the commissioner's office. Each year, they define the data needs for management of each salmon fishery (reported in annual management reports, BoF reports, stock status reports, and preseason forecasts), develop statistically valid study designs (or operational plans) to obtain the necessary information (Riffe and Geiger 2004), and collect, analyze, and report the data necessary for effective fisheries management following procedures detailed in its study plans. Each step of this process is guided by state policies, standards, and/or nationally recognized scientific standards. The state has a well-organized and adequately funded program. The program is augmented by research conducted by biologist in numerous Federal agencies including the Alaska Region of the NMFS which is responsible for management conservation and protection of living marine resources (including fishery resources, habitat, and marine protected species) within the U.S. Exclusive Economic Zone (waters three to 200 miles offshore), federal land management agencies including the U.S. Fish

	and Wildlife service, U.S. Park Service, U.S. Bureau of Land Management, and the U.S. Forest Service which manage national wildlife refuges, parks, and forests in Alaska and perform fisheries research projects and activities associated with management of subsistence fisheries on federal lands, as well as University researchers who perform numerous independent fisheries research project in Alaska. Scientists at ADFG and other state agencies routinely interact with federal and academic researches. Collectively these organizations have established the capacity to monitor and manage the state of Alaska's salmon stocks.
Clause: **5.2 The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration must be monitored.** **5.2.1 The research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems must be established.** ***FAO Criteria 12.5***	
Evidence adequacy rating: **☑ High** **☐ Medium** **☐ Low**	
Clause:	**Evidence**
5.2	Alaska has a large and ongoing fishery monitoring and stock assessment program to obtain the extensive scientific information necessary to establish new escapement goals, modify existing escapement goals, and provide other scientific information that allows fisheries to be managed to achieve escapement goals or other benchmarks (such as harvest quotas or allocations). Fishery monitoring and stock assessment programs collect escapement data (using counting towers, weirs, aerial and foot surveys, sonar, and mark-recapture abundance estimates), age, sex, size, tag recoveries, and run timing information from both the spawning portion of the stock and the fish harvested in commercial, sport, subsistence, and personal use fisheries, stock separation information (via scale samples, genetic sampling, tagging studies, or parasite sampling), harvest estimates and catch sampling, and environmental data (such as river discharge, water quality, and spawning and rearing habitat quality and quantity). Coded wire tags and otolith marks on hatchery fish to support identification and abundance of hatchery fish in catches of natural fisheries and potential strays into native stock systems. Every three years (based on the BoF schedule) each 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) reviews the status of all stocks within a management area, recommends new and modified escapement goals based on the new data that have been collected and analyzed in the past three years, defines stocks of concern, and develops management or action plans to deal with fishery management issues (examples of recent stock status and escapement goal reports presented to the BoF are: Witteveen *et al.*, 2009; Otis *et al.*, 2010; Morstad and Baker 2009; Volk *et al.*, 2009; Menard and Bergstrom 2009, Howard *et al.*, 2009; Baker *et al.*, 2009; and Erickson *et al.*, 2009). The BoF also considers potential effects of sport fisheries on riparian habitats when

	making regulatory decisions. Four management plans (5AAC 56.180, 57.180, 59.180, 60.180, 61.180, and 63.180) restrict sport fishing in specific areas and/or provide ADFG with authority to close riparian areas to sport fishery if those fisheries are causing damage to riparian areas.
5.2.1	**The research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems must be established**. Alaska's stock assessment and management programs often specifically include elements that take into consideration potential impacts resulting from pollution or habitat alterations (including climate change). The first guiding principle of management of Alaska's salmon fisheries included in the Sustainable Salmon Policy (5AAC 39.222(3)(c)(1)(A)) states "salmon spawning, rearing, and migratory habitats should be protected …", and habitat protection, ecosystem monitoring, consideration of habitat and climate change effects when setting escapement goals, and monitoring or minimizing negative effects from fishing or development, are specifically required in numerous sections and subsections of the state's policy for management of sustainable salmon fisheries. The Habitat Division of ADFG is responsible for permitting projects that potentially affect salmon habitat. They routinely impose project specific stipulations within permits (such as work timing limitations) that are designed to eliminate or minimize the negative impacts to anadromous fish stocks or habitat. Habitat biologists also perform numerous research projects designed to monitor or evaluate the potential effects of development projects (copies of habitat division research reports are available at http://www.habitat.adfg.alaska.gov/techrepts.php). ADFG fishery and habitat biologists also interact with other state and federal agencies to ensure that land management decisions (such as road construction, logging, mining, hydroelectric development, or urbanization) do not degrade fish habitat or negatively affect salmon productivity. The Sport Fish Division strategic plan (http://www.sf.adfg.state.ak.us/Static/strat_plan/PDFs/StrategicPlan2010Final.pdf) lists habitat research and protection as one of its core function and the division maintains a separate section, whose primary function is habitat conservation and access defense. Projects conducted by this group include maintaining the state's catalog and atlas of waters important for spawning, rearing, and migration of anadromous fish. This catalog is important because Alaska law (AS 16.871) provides anadromous waters additional protection from development or pollution. The catalog currently includes over 17,000 waters, which is estimated to represent less than half of the anadromous waters in Alaska (http://www.sf.adfg.state.ak.us/SARR/awc/). The Sport Fish Division habitat team also performs projects to assess and improve fish passage, evaluate and reduce the impact of invasive species, develop habitat restoration techniques and perform habitat restoration projects. Sport Fish Division also operates a statewide program designed to obtain the hydrologic information necessary to apply for instream flow water reservations to protect fish habitat. These flow reservations are targeted on the highest value waters or those with the highest risk of potential damage (Estes 1998). The Sport Fish Division also operates the Katchemak Bay Research Reserve which performs research and monitoring programs including programs related to the effects of climate change including changes in

	sea level and marine temperatures and freshwater temperatures, frequency of storm events, long-term drying trends, rapid loss of coastal glaciers, and coastal uplift (http://www.habitat.adfg.state.ak.us/index.cfm/FA/research.home). A major source of funding to Alaska for salmon related projects is the Pacific Coastal Salmon Recovery Fund (PCSRF). The PCSRF was established by the United States Congress in 2000 to protect, restore, and conserve Pacific salmon and steelhead populations and their habitats (http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/Index.cfm). The Alaska Sustainable Salmon Fund (AKSSF) is composed of the PCSRF funding that is allocated to Alaska (http://www.adfg.state.ak.us/special/akssf/index.php). Since its inception, the AKSSF has provided millions of dollars to Alaska for salmon research and recovery programs, over $25 million of which has gone to salmon habitat assessment and rehabilitation projects including project to assess the effects of climate change on salmon productivity. (http://www.adfg.state.ak.us/special/akssf/docs/2009/akssf09_funded_projct.pdf).

Clause:

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

5.3.1 States must stimulate the research required to support national policies related to fish as food.

FAO Criteria 12.7

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
5.3	The State of Alaska participates in appropriate international organizations, treaties, and research funding organization designed to promote the optimum use of fisheries resources. The United States is a member of the NPAFC (http://www.npafc.org/new/index.html), established in 1993, which eliminated directed fishing and attempts to limit bycatch of anadromous fish in the North Pacific. Alaska is an active participant in the Pacific Salmon Commission process (http://www.psc.org/), and through that process seeks to ensure the coast-wide conservation and optimum use of Pacific salmon. ADFG and various federal agencies participate in numerous organizations that seek to obtain information about the ecosystem and status and management of salmon fisheries. Examples include: the North Pacific Research Board (NPRB) (http://www.nprb.org/index.html/) *which distributes monies from the earnings of the Environmental Improvement and Restoration Fund (ERIF), 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 North Pacific Research Board and the National Science Foundation that funds research and ecosystem modeling 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/) is a program of the NPRB that 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**;** The Wild Salmon Center (http://www.wildsalmoncenter.org/) works to protect the best remaining wild salmon ecosystems across the Pacific Rim**;** The Pacific States Marine Fisheries Commission (http://www.psmfc.org/) coordinates research activities, monitors fishing activities, and collects and maintains databases on salmon, steelhead and other marine fish occurring off the coast of California, Oregon, Washington, Idaho, and Alaska**;** The Pacific Coastal Salmon Recovery Fund (http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/Index.cfm) was established by Congress in FY 2000 to provide project funding to states and tribes of the Pacific Coast Region to protect, restore, and conserve Pacific salmon and steelhead populations and their habitats; and The Saltonstall-Kennedy grant program for fisheries research and development (http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm) is a fund administered by the NMFS to provide grants or cooperative agreements for fisheries research and development.
5.3.1	**States must stimulate the research required to support national policies related to fish as food.** State and national policies regarding seafood are guided and driven by the Alaska Seafood Marketing Institute (ASMI), Food and Drug Administration (FDA), Department of Agriculture (USDA), the National Institute of Health (NIH), and many others. ASMI 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 include: conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state, prepare market research and product development plans for the promotion of any species of seafood and their by-products, and establish committees related to the marketing of salmon and salmon products (AS 1651.090). The state of Alaska also operates the Fishery Industrial Technology Center as a component of the University of Alaska (http://www.sfos.uaf.edu/fitc/) . The Fishery Technology Center provides training for harvesting, processing, and conservation of fishery resources of Alaska, provides information and technical assistance to users of fishery resources, provides research and development activities to adapt existing or create new technologies to enhance the economic value of the industry, and encourages joint projects between the fishing industry and government to enhance the productivity of the fishing industry.

Clause:

5.4 The fishery management organizations must 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.

FAO Criteria 12.17

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
5.4	Most of the salmon harvested in Alaska come from stocks that originate in Alaska, however, some Alaskan fisheries harvest salmon stocks from others countries or other states, and Alaska salmon stocks often spend a portion of their life in international waters where they are subject to other fishing activities. The United States is a member of the NPAFC, established in 1993, which eliminated directed fishing and attempts to limit bycatch of anadromous fish in the North Pacific (http://www.npafc.org/new/index.html). Alaska cooperates with appropriate U.S. federal agencies (such as NMFS) and agencies of other countries (such as the Department of Fisheries and Oceans, Canada) to ensure that appropriate environmental and stock status information necessary for management of trans-boundary salmon stocks is obtained. NMFS conducts numerous studies to estimate and document salmon bycatch in offshore fisheries, determine spatial and temporal areas of migration and ocean rearing of juvenile salmon, and evaluate environmental factors that affect ocean growth and survival of salmon (the Bering Arctic Subarctic Integrated Services, BASIS, and SE Coastal Monitoring Program, SECM, are examples of this type of research). The Pacific Salmon Treaty, signed in 1985, sets out long-term goals for Alaska and US salmon stocks and fisheries and established the Pacific Salmon Commission (PSC) to implement the goals of the treaty (http://www.psc.org/). Alaska is intimately involved in the Pacific Salmon Commission with members on all panels and technical committees that help make decisions on all aspects of research and management of trans-boundary salmon stocks. ADFG research and management staff work directly with their Canadian and southern US counterparts to ensure that appropriate research and management decision are implemented. During the Assessment Team visit to the NPFMC cycle of meetings in Anchorage, Dec 6th - 14th 2010, the Yukon River Panel (YRP) also convened a Committee meeting session where fishery performance was reviewed and up-dates of co-funded research programs and co-management related issues were presented. The YRP provides recommendations to management entities on in both sides of the US/Canada border concerning the conservation and management of salmon originating in Canada. Unlike other regional panels and committees established under the Pacific Salmon Treaty, the Yukon River Panel follows its own internal procedures and does not report to the Pacific Salmon Commission—the body formed by U.S. and Canadian governments to implement the PST. The YRP was established under the Yukon River Salmon Agreement, and is comprised of 6 representatives of the Canadian section and 6 representatives of the United States. The Agreement recognizes the need for co-management of salmon stocks on the Yukon River

	for conservation and habitat protection since salmon are harvested by both US Alaska and Canada, that coordinated research is also necessary and that subsistence (Alaska) and aboriginal fisheries in Yukon have priority over other fisheries in Yukon http://yukonriverpanel.com/salmon/wp-content/uploads/2009/03/yrp-agenda-defundng2010.pdf.

Clause:

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

5.5.1 Results of analyses must 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.

5.5.2 In the absence of adequate scientific information, appropriate research must be initiated in a timely fashion.

FAO Main Criteria 12.3 Others 7.4.2

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
5.5	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 were obtained from a small number of participants (for example: Weiland *et al.*, 2003).
5.5.1	ADFG routinely publishes and distributes reports including area management reports, preseason forecasts, BoF reports, stock status reports, research reports, data reports and technical reports. Most fishery harvest data are available on ADFG website, various ADFG publications series, the Alaska Fisheries Research Bulletin, or the general scientific literature. Fisheries reporting series have varied over time. Currently the state reporting series include Sport and Commercial Fisheries Research and Management Reports, and the Alaska Fisheries Research Bulletin. Complete standards for Fish and Game Publication are found in the ADFG Writers Guide third edition. The guide is available online at: http://www.adfg.state.ak.us/pubs/adfguide/adfgwritersguide.pdf.
5.5.2	Each year ADFG fisheries staff, and staff from other agencies involved in salmon management in Alaska, review and assess the status of Alaska's salmon fisheries and the need for new information. Assuming funding is available, new programs are implemented, or lower priority programs are discontinued. Alaska's Sustainable Salmon Policy (5AAC 39.222) formalizes this review process by requiring regular stock status reports (corresponding with the BoF cycle). During this process, if a stock is determined to present a yield, management, or conservation concern, the BoF in conjunction with ADFG will develop management plans that may include research projects as needed to provide the information to address the concern about the fishery.

C. The Precautionary Approach

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

FAO 7.5.2/7.5.3

Confidence Ratings	Low	None	Medium	None	High	4 out of 4

Clause:

6.1 States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded.

6.1.1 Target reference point(s) shall be established.

6.1.2 Limit reference points shall be established.

6.1.3 Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points

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

FAO Main Criteria 7.5.2 Others 7.5.3

Evidence adequacy rating:

☑ High ☐ Medium ☐ Low

Clause:	Evidence
6.1 6.1.1	The primary reference points for salmon management are escapement goals. All of Alaska's salmon fisheries have been divided into individual runs or aggregates of runs for management purposes. For each of these individual runs or stock aggregates, an escapement goal has been established. The Policy for the Management of Sustainable Salmon Fisheries (5AAC 39.222) and the Policy for Statewide Salmon Escapement Goals (5AAC 39.223) are the primary regulations that guide establishment of escapement goals. A principle tenant of the Sustainable Salmon Policy is "in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively" (5AAC 39.222(c)(5)). This regulation further defines the "precautionary approach" to involve consideration of: the uncertainties in salmon fisheries and habitat management; biological, social, cultural, and economic risks; consideration of the needs of future generations; and placement of the burden of proof on those activities that pose a risk to salmon habitat or production. These policies define two primary types of escapement goals. A Biological Escapement Goal (BEG) is the escapement that provides the greatest potential for maximum sustained yield. BEGs are usually established using stock-recruit information which generally requires multiple years of run reconstructions to establish. BEGs are expressed as a range based on factors such the productivity of the stock and data uncertainty. A Sustainable

Escapement Goal (SEG) is the level of past escapement (as demonstrated by escapement counts or indices) that has resulted in sustainable yield over a 5-10 year period. SEG's are used when data are insufficient to establish a BEG, usually due to lack of stock specific harvest data. SEGs are also set as a range and take into account uncertainty of the data. Once established, ADFG attempts to manage fisheries to maintain an even distribution of escapement within the boundaries of a BEG or SEG.

Two other, less common escapement goals are also defined in the Sustainable Salmon Policy. A Sustainable Escapement Threshold (SET) is a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. The SET is below the lower bound of a BEG or SEG and is established when needed for salmon stocks of management or conservation concern. An Optimum Escapement Goal (OEG) is a specific management objective for salmon escapement that considers biological and allocative factors and may differ from BEG or SEG. An OEG may be expressed as a range but the minimum bound of an OEG will always be above the SET.

In many cases, an escapement goal is developed for an individual species of salmon returning to a specific river. Escapement goals are approved by the BoF and often incorporated into management plans for the stock. For example, the Situk River set-net fishery, which occurs in the Yakutat management area near the mouth of the river, harvests sockeye, Chinook, pink, and coho salmon (Woods 2008). Biological escapement goal ranges (BEGs) have been established for each of these species. The sockeye, Chinook, and pink salmon runs are monitored using a weir on the Situk River and the coho salmon escapement is measured with aerial surveys. As the season progresses the local area biologists monitor the status of the runs and implement regulatory changes by emergency order on the commercial set gillnet and troll fisheries as well as sport, personal use, and subsistence fisheries, to ensure that the escapement goal for each species is achieved.

In other cases, escapement goals are established for aggregated stock groupings because fisheries do not target an individual run or because stock specific estimates of harvest or escapement are not available. For example, escapement goals for chum salmon in the Alaska Peninsula are for an aggregate of the runs within certain districts as counted by aerial escapement surveys on approximately half the chum salmon runs in the area (Nelson and Lloyd 2001). Management actions are taken on the fishery based on the status of the aggregate spawning escapement counts.

ADFG notes in its Management Plans (e.g. 2010 South East Drift Gill Net Fishery Management Plan that *'Achievement of the management objectives (e.g. escapement goals), will be accomplished by inseason adjustments of fishing time and area to control harvests in specific areas in accordance with salmon run strength and timing. Comparisons of current-year fishing performance to historical fishing success (i.e., catch per unit effort, or CPUE analysis) are a major component of inseason run strength assessment. This approach assumes catch rates are an accurate reflection of run strength by time period and can be relied upon to indicate salmon escapements through the fishing area. Past experience has demonstrated that management of salmon fisheries based only on fishery*

	performance or Catch per Unit of Effort (CPUE) data can be misleading, especially for mixed- stock fisheries. Therefore, other available run-strength indicators will also be used including spawning escapements, stock composition estimates, test fishing, observed salmon concentrations in closed water areas, catches from other fisheries, and salmon run timing models.' ADFG notes that 'The increasing availability of hatchery-produced salmon has become a major factor in the management of the Southeast Alaska drift gillnet fisheries, including coho and summer chum salmon throughout the region and sockeye salmon in District 11. Where inseason management is based on fishery performance, it may be difficult to gauge natural stock run strength if significant numbers of hatchery fish are present in the catch. Where possible, the hatchery component of the catch will be separated when evaluating fishery performance, and management decisions outside of terminal areas will focus on the conservation of wild stocks.'
6.1.2	**Limit reference points shall be established.** All ADFG escapement goals (whether BEGs, SEGs, or OEGs) are established as a range. The lower end of each range is essentially a limit reference point, because all fisheries are managed to provide escapements that are above the lower end of the escapement goal range. Sustainable Escapement Threshold (SET) is another limit reference point that is applied to some salmon stocks. The SET is a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. The SET is below the lower bound of a BEG or SEG and is established when needed to provide additional protection for salmon stocks of management or conservation concern. ADFG also occasionally establishes precautionary reference points (SEG Thresholds) for which only the lower bound defined. SEG Thresholds are established in situations where a stock is managed incidentally to a targeted stock, fishing power is low, or there is no apparent relationship between spawners and recruits (Bernard *et al.*, 2009). In these situations, management measures enacted to met an SEG or BEG have proven to be either ineffective because of the inability to influence already low levels of harvest, or onerous because of differential effects on the escapement of the target species or the economic value of the fishery. By establishing an SEG Threshold, the state recognizes the limitations of current management options, while ensuring that a threshold spawning abundance is established that ensure the viability of the stock. As an example, the 2010 escapement goal report for the AYK (Volk *et al.*, 2009) includes a recommendation that the East Fork Andreafsky weir-based BEG of 65,000 – 130,000 summer chum salmon be changed to an SEG Threshold of greater than 40,000 fish. This recommendation is based upon stock-recruit analysis that accommodated uncertainty associated with missing data and measurement error which indicated that even with very little harvest on the stock, the existing BEG was rarely met. Analysis indicated that an SEG Threshold would provide greater than a 90% probability of providing at least 70% of maximum sustained yield. ADFG continues to gather information that allows for stock specific escapement goals. There are situations as reported by Edgers *et al.*, 2009 that wild summer chum escapements, based on 3 recently established sustainable escapement goal thresholds, were each below goal (although fall chum escapements were good in

	most systems monitored) (Run Forecasts and Harvest Projections for 2010 Alaska Salmon Fisheries and Review of the 2009 Season). Inseason adjustment of fishing time provides the principal management tool in these situations.
6.1.3	**Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points**. Alaska has a large and ongoing stock assessment program to obtain the extensive scientific information necessary to establish new escapement goals, modify existing escapement goals, provide other scientific evidence that measures the fishery in relation to the target escapement goals, and allows managers to impose preseason and inseason management actions to alter fisheries to achieve escapement goals or other benchmarks (such as harvest quotas or allocations). These stock assessment programs collect escapement data (using counting towers, weirs, aerial and foot surveys, sonar, and mark-recapture abundance estimates), age, sex, size, tag recoveries (coded wire tags and otolith marks for enhancement fisheries), and run timing information from both the spawning portion of the stock and the fish harvested in commercial, sport, subsistence, and personal use fisheries, stock separation information (via scale samples, genetic sampling, tagging studies, or parasite sampling), harvest estimates, and environmental data (such as river discharge, water quality, and spawning habitat quality and quantity). Data measuring is a continuous activity timed to coincide with the commencement of the runs of each stock or stock aggregate. Also assessed are the effects of fishing mortality on salmon stocks from other fisheries, such as ground fish trawling in the Berring Sea and Gulf of Alaska.
6.1.4	**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 that escapement goals must be established for all exploited salmon stocks. 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 recover of any stocks of concern (examples of recent stock status and escapement goal reports presented to the BoF: Witteveen *et al.*, 2009, Otis *et al.*, 2010; Morstad and Baker 2009; Volk *et al.*, 2009; Menard and Bergstrom 2009; Howard *et al.*, 2009; Baker *et al.*, 2009; and Erickson *et al.*, 2009). In regulation 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. 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 on each fishery based on the projected inriver run at the weir. The BEG for Situk River Chinook salmon is 450 – 1050 three ocean or older fish. This BEG was established using stock-recruit information obtained by weir counts and age specific harvest samples taken from the lower river commercial gillnet fishery. The management plan calls for a closure of all fisheries (subsistence, sport, personal, commercial set gillnet, and near shore troll commercial troll fishery) if the projected inriver escapement (based on weir counts and historic run timing) is below 350 fish. If the projected inriver escapement is 350 – 450 Chinook salmon, the sport fishery will be closed by emergency order, 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: 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 (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 (09.360) provides management directives for the mainland fishery based on harvestable surplus of Chignik River sockeye.

7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient a suitable method using risk assessment must be adopted to take into account uncertainty.

FAO 7.5.1/7.5.4/7.5.5

ECO 29.6/32

Confidence Ratings	Low	None	Medium	None	High	7 out of 7

Clause:

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.

7.1.2 The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.

FAO Main Criteria 7.5.1 Others 29.6/32

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
7.1	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) 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.

	The precautionary approach is also applied into the Management Plan for High Impact Emerging Fisheries(5AAC 39.210) and the Policy for Management of Mixed Stock Salmon Fisheries (5AAC 39.220) http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[JUMP:'5+aac+39!2E222']/doc/{@1}?firsthit.
7.1.2	**The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.** The Policy for the Management of Sustainable Salmon Fisheries specifies "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" (5 AAC 39.222 (a)(5)(A)(iv)).

Clause:

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

7.2.1 Provisions shall be made for the gradual development of new or exploratory fisheries while information is being collected on the impact of these fisheries, allowing an assessment of the impact of such fisheries on the long-term sustainability of the stocks.

7.2.2 Precautionary management provisions shall be established early on.

7.2.3 Information collection shall be initiated early to allow impact assessment

FAO Main Criteria 7.5.4

7.2.4 Contingency plans must be agreed in advance for the appropriate temporary management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the resource. Measures shall be temporary and shall be based on best scientific evidence available.

FAO Criteria 7.5.5

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
7.2	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. Also, the Policy for Management of mixed salmon stock fisheries (5AAC 39.220(d) requires that new or expanding fisheries be restricted for salmon stocks that are already fully allocated.
7.2.1	**Provisions shall be made for the gradual development of new or exploratory fisheries while information is being collected on the impact of these fisheries, allowing an assessment of the impact of such fisheries on the long-term sustainability of the stocks.** 5AAC 39.210(e)(7) Management Plan for High Impact Emerging Fisheries requires that a plan for management of emerging fisheries include a plan to determine the productivity of the species and impact of the fishery. See reference to Sustainable Salmon Policy above for clause 7.2 as evidence.
7.2.2	**Precautionary management provisions shall be established early on** See reference to Sustainable Salmon Policy above for clause 7.2 as evidence.
7.2.3	**Information collection shall be initiated early to allow impact assessment** See reference to Sustainable Salmon Policy above for clause 7.2 as evidence.
7.2.4	**Contingency plans must be agreed in advance for the appropriate temporary management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the resource. Measures shall be temporary and shall be based on best scientific evidence available.** A fundamental objective of Alaska salmon fishery management is that escapement goals must be met before fishery opportunities are made available. Where a fishery is allowed, the escapement goals, agreed in advance, provide the pre-determined objective to which inseason temporary management responses to restrict fishery access are taken using the EO regulatory tool. The same approach can be taken for unforeseen adverse environmental changes that may impact salmon returns. The statewide 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 BoF, on a regular basis, a stock status report, a review of escapement goals, and action plans that include management directives to promote recover of any stocks of concern (examples of recent stock status and escapement goal reports presented to the BoF: Witteveen *et al.*, 2009; Otis *et al.*, 2010; Morstad and Baker 2009; Volk *et al.*, 2009; Menard and Bergstrom 2009; Howard *et al.*, 2009; Baker *et al.*, 2009; and Erickson *et al.*, 2009). Other examples of fishery management plans that contain pre-determined fishery management actions to meet escapement goals or other fishery targets are: 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 (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 (09.360) provides management directives for the mainland fishery based on harvestable surplus of Chignik River sockeye http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi- bin/folioisa.dll/aac/query=[Group+!275+aac+39!2E210!27!3A]/doc/{@1}/hits_only?Firsthit. Under the 5 AAC 39.210. Management Plan for High Impact Emerging Fisheries (1(d)) ADFG shall close a high impact emerging commercial fishery once it has been designated as such by the commissioner, and may not reopen the fishery until an interim management plan and associated regulations have been adopted by the commissioner. If an interim management plan and regulations have been adopted, the commissioner may allow the fishery to continue. 8 (g) Upon completion of an interim plan, ADFG shall petition the BoF under 5 AAC 96.625 to consider adoption of the management plan and associated regulations at its next regularly scheduled meeting.

D. Management Measures

8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources. ***FAO 7.1.1/7.1.2/7.1.6/7.4.1/7.6.1/7.6.9*** ***ECO 29.2/29.4/30***						
Confidence Ratings	**Low**	**None**	**Medium**	**None**	**High**	**8 out of 8**

Clause:

8.1 Conservation and management measures shall be based on the best scientific evidence available.

8.1.1 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.

FAO 7.1.1 /7.4.1/29.2/29.4

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
8.1	ADFG is the principle agency tasked with conducting research and providing the best scientific evidence for conservation and management purposes. Since statehood, ADFG has compiled databases on salmon runs for each of the 5 species and within the Regions and Districts of Alaska. Within the management framework for Alaska salmon, there is a clear distinction or roles and responsibilities for research, conservation and management of salmon resources. Alaska has a large and ongoing fishery monitoring and stock assessment program to obtain the extensive scientific information necessary to establish new escapement goals, modify existing escapement goals, and provide other scientific information that allows fisheries to be managed to achieve escapement goals or other benchmarks (such as harvest quotas or allocations). Fishery monitoring and stock assessment programs collect escapement data (using counting towers, weirs, aerial and foot surveys, sonar, and mark-recapture abundance estimates), age, sex, size, tag recoveries, and run timing information from both the spawning portion of the stock and the fish harvested in commercial, sport, subsistence, and personal use fisheries, stock separation information (via scale samples, genetic sampling, tagging studies, or parasite sampling), harvest estimates and catch sampling, and environmental data (such as river discharge, water quality, and spawning and rearing habitat quality and quantity). CWT and otolith marks are collected on hatchery fish to support identification and abundance of hatchery fish

	in catches of natural fisheries and potential strays into native stock systems. Every three years (based on the BoF schedule) each 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) reviews the status of all stocks within a management area, recommends new and modified escapement goals based on the new data that have been collected and analyzed in the past three years, defines stocks of concern, and develops management or action plans to deal with fishery management issues (examples of recent stock status and escapement goal reports presented to the BoF are: Witteveen *et al.*, 2009; Otis *et al.*, 2010; Morstad and Baker 2009; Volk *et al.*, 2009; Menard and Bergstrom 2009; Howard *et al.*, 2009; Baker *et al.*, 2009; and Erickson *et al.*, 2009). The system is highly transparent (publically open) and follows a rigorous process that provides a balance between the interests of economic access to fishery and conservation of resources. Essentially, the fishery management plans- derived through the scientific research and fishery data collection process carried out daily by ADFG are presented to the BoF for discussion, adoption or amendment to satisfy conservation and fisheries management goals.
8.1.1	**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.** State Regulation, 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. It is apparent, that there may not always be the same level of scientific information and data available to the biologists and personnel of AD&G for implementation of fishery management and conservation measures. This can be for a variety of reasons: 1. Historical evolvement of fishery run data sets for fisheries and districts 2. Access to fisheries and resources, topography and the decision process of allocation of staff resources (i.e. no fishery management system has an infinite access to resources to conduct research, monitoring and conservation planning). Historical fishery runs, concerns and fluctuations and economic interest are the obvious drivers in this decision making process. The witnessing of the BoF meeting over a 3 day period, provided the Assessment Team with sufficient insight to understand that such a decision making process exists, that it is transparent and also is undertaken in an appropriate manner with respect to the balance of interests, conservation and sustained use and economic access to fishers. Where different levels of scientific evidence are available – i.e. where confidence in datasets is lower, ADFG has developed a number of management approaches, along the

	principles of BEG's and with regard to the State Policy for conservation and sustained use. Escapement remains the top priority based on 'best' scientific evidence for that particular river system. Readers should also review Precautionary Approach Section C.

Clause:

8.2 States shall seek to identify domestic parties having a legitimate interest in the use and management of fisheries resources.

8.2.1 Arrangements shall be made to consult these parties and gain their collaboration

FAO Main Criteria 7.1.2 Others 7.1.6

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
8.2	Three general classes of salmon users, commercial harvesters, subsistence harvesters and sport fishing harvesters, are primarily evaluated and managed by three dedicated ADFG Divisions. Regulation of the BoF number 16.05.251(e) states 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 BoF receives formal proposals and advice from 82 Local Advisory Committees which are each comprised of a membership representative of users in each of the 82 local communities. The BoF operates on a 3 year cycle of meetings that covers each of the major Regions and Districts of Alaska salmon (and other state managed fisheries). There are 82 appointed Advisory Committees that operate throughout the State. These committee representatives provide 'the vehicle 'through which stakeholder and fishery participants can engage in the management decision process of the BoF and ADFG. The system is highly transparent (publically open) and follows a rigorous process that provides a balance between the interests of economic access to fishery (the participants) and conservation of resources- fishery and environmental conservation factors. Any individual has the entitlement to lodge a proposal to the BoF process with respect to a current plan, amendment, proposal to change/amend regulations of an allocative nature etc. Essentially, the fishery management plans- derived through the scientific research and fishery data collection process carried out daily by ADFG are presented to the BoF for discussion, adoption amendment and ratification. State Regulation, the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) requires that "public support and involvement for sustained use and protection of salmon resources should be sought and encouraged" (principal 4) and specifies 5 criteria regarding dispute resolution,

	dissemination of information, open public process, proportional burden of conservation among users, public education. This Policy is implemented primarily through the communications of the BoF and its 82 Local Advisory Councils through the ADFG staff. During the Assessment Team's visit to the BoF meeting in Homer on the November 15-19th specific to the Lower Cook Inlet Cycle of meetings, a presentation was provided by Jim Marcotte, Executive Director of the BoF, describing the appointment, role and management process of the BoF. (Marcotte, 2010 BoF powerpoint Presentation). As testified by the witnessing of this BoF cycle of meetings, the BoF's decision making process can be verified as public and transparent. For example, members of the public can attend the meetings and if desirable, make individual representation to the BoF through a defined procedure. The BoF is analogous to the NPFMC, in that they make allocation decisions, after the conservation decisions have been made. The cycle of meetings generally occurs from October to March with all fisheries under the BoF being considered, including commercial, sports, subsistence and personal use. There is also a special petition agenda change request procedure available for the BoF to consider out-of-cycle requests. The meeting cycle is set out for 2010-2011 and available at http://www.boards.adfg.state.ak.us. Proposals to the BoF are published for each cycle of meetings, such as the 2010-11 BoF's cycle at http://www.boards.adfg.state.ak.us/fishinfo/meetinfo/2010_2011/2010-2011-bof-prop-final.pdf. Either an individual or a group may make a proposal to the BoF with respect to proposals for amendments to State legislature that may impact upon the interests of the proposer. A standard format and direction/advice to submitting proposals is provided by the BoF. An analysis of proposals to the BoFs for 2006-2007 revealed that 128 proposals came from individuals. The remaining proposals split between ADFG advisory committees (47), village councils (7), groups and associations (21), ADFG (37), Federal Advisory Councils (4) and the BoF (2). Of the BoF proposals between Dec. 2005 and Mar. 2006, 129 proposals (36.5 %) were adopted.
8.2.1	**Arrangements shall be made to consult these parties and gain their collaboration** See section 8.2.1**.**

Clause:
8.3 The level of fishing permitted shall be commensurate with the current state of the fishery resources.

FAO Main Criteria 7.6.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
8.3	State Regulation, the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) requires that "salmon fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning" (Principal 2) and specifies 9 criteria regarding stock assessment, escapement goals related to sustained yield, both measurement and systematic sources of variation of stock assessment, protection of genetic and phenotypic variation, incidental mortality, protection of non target stocks, protection of ecosystem function, and abundance trends. The Policy is implemented through the various fishery management plans for different fisheries in different regions and areas of the state. The current state of any salmon fishery resource is under constant monitoring. This includes; catch data through the fish ticket system for all salmon species, caught by all commercial gear types in all locations. Salmon runs are measured by a variety of tools ranging from physical observation/aerial surveys, to mark-recapture experiments, to in situ automatic counters. The highest level of management precision is provided for stocks managed on the basis of establishing a biological escapement goal (BEG). BEG's require that stock-specific catch estimates are available. Where there is less data on run strength or harvest available, index rivers may be used as the basis to establish sustainable escapement goals for stocks (SEG). SEG's are level of escapement, indicated by an index or an escapement estimate that is known to provide for sustained yield over a 5 to 10 year period. One example of fishing level permitted commensurate with the current state of the fishery is the Chinook salmon stocks in recovery state of the Stikine and Taku rivers. The 2011 pre-season terminal run forecast for large Stikine River king salmon is 30,000 fish. The resulting U.S. Allowable Catch (AC) is 190 large Stikine kings. An AC of this size will not allow for directed commercial fisheries to occur in early May. An in-season terminal run estimate will be produced in late May. If the first in-season estimate is significantly greater than the pre-season forecast, limited directed king salmon fishing could occur. The 2010 pre-season terminal run forecast for large Stikine River king salmon was 23,000 fish and terminal run of this size resulted in no U.S. Allowable Catch (AC) of large Stikine kings. The 2011 forecast is the third consecutive Stikine River king salmon pre-season terminal run forecast in the past six seasons that does not allow for directed commercial fisheries. The 2011 pre-season terminal run forecast for large Taku River king salmon is 41,000 fish. A terminal run of this size yields a U.S. Allowable Catch of 1,533 large Taku king salmon. Given the relatively small Allowed Catch and taking into consideration forecast confidence

	intervals, directed Chinook commercial troll and gillnet fisheries in District 11 will not open unless an in-season terminal run estimate produced in late May, provides sufficient allowed catch for manageable fisheries to be prosecuted. The 2010 pre-season terminal run forecast for large Taku River king salmon was 41,328 fish yielding a U.S. Allowable Catch of 1,781 large Taku king salmon. The 2011 season would be the fifth season the preseason forecast provides allowed catch for directed fisheries on returning Taku River king salmon since these fisheries were reestablished in 2005. **Sources** http://dungie.adfg.state.ak.us/AdfgDocument.po?DOCUMENT=22853 http://dungie.adfg.state.ak.us/AdfgDocument.po?DOCUMENT=21665 Also refer to sections 6.1.1 and 6.1.2 (target and limit reference points) and section 9.2 for further evidence that supports this clause.

Clause:

8.4 Appropriate measures shall be applied to minimize:

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

8.4.1 Technical measures shall be taken in relation to:

- **fish size**
- **mesh size or gear**
- **discards**
- **closed seasons**
- **closed areas**
- **areas reserved for particular (e.g. artisanal) fisheries**
- **protection of juveniles or spawners**

8.4.2 Suitable arrangements in place to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques

FAO Main Criteria 7.6.9 Other 30

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
8.4	Alaska law prohibits “wanton waste”, such as the discarding of salmon by salmon harvesters (AS 16.05.831, SF 75.065). Bycatch of non-targeted species is not a major issue in most Alaska salmon fisheries. Most non-targeted fish harvested in salmon fisheries are other species of salmon and are reported on fish tickets. Alaska fishing regulations, management plans, and inseason management actions are often specifically designed to minimize the harvest of non-targeted salmon species. For example, the upper Cook Inlet gillnet fishery targets sockeye, pink, and chum salmon, but coho salmon are also caught, sold, and reported on fish tickets. The Cook Inlet Northern District Salmon Management

	Plan (5AAC 21.358) provides a series of regulatory measures to minimize harvest of coho salmon bound for the northern district of upper Cook Inlet. Alaska salmon, primarily juvenile Chinook and chum salmon, are caught in Alaska groundfish fisheries. In Alaskan waters, groundfish operators are required to keep on board, or at the shoreside processing plant, all salmon harvested as bycatch in trawl fisheries so that they may be sampled by agency personnel (5AAC 39.166). Salmon bycatch in trawl fisheries for walleye pollock in the Bering Sea and Gulf of Alaska are monitored by NMFS with an onboard observer program (Witherell *et al.*, 2002). In 2010 the NMFS issued a record of decision (ROD) on the environmental impact of the Bering Sea Pollock trawl fishery on Chinook salmon. (http://www.fakr.noaa.gov/sustainablefisheries/bycatch/salmon/chinook/feis/amd91rod_0510.pdf). This ROD found that up to 95% of the Chinook salmon bycatch from the Bering Sea and Aleutians ground fish fisheries occurs in the Bering Sea Pollock fishery and catch limits and incentives to reduce bycatch were recommended. These have since been implemented in 2010 under Amendment 91 to the Fishery Management Plan for Groundfish in the BSAI. An EIS for non-Chinook bycatch (made up primarily of chum salmon) is currently being performed by the NMFS (see Chum salmon bycatch discussion paper, http://www.fakr.noaa.gov/npfmc/current_issues/bycatch/chumbycatch1208.pdf). A significant portion of the chum salmon (20-34%) and Chinook salmon (56%) bycatch from trawl fisheries are fish that originate from western Alaska. ADFG has implemented significant restrictions on chum and Chinook salmon fisheries in areas of western Alaska in response to declining returns, and reducing the trawl bycatch is part of the planned effort to help restore these stocks. Operation of all salmon fishing gear (purse seines, gillnets, and troll gear) is required to minimize incidental harvest of non-target species. Time and area restrictions limit when and where specific fisheries occur and restrictions are also imposed by regulation on all types of fishing gear (e.g., mesh size restrictions and length of nets for gillnets, number of fishing lines, rods, and gurdies for troll gear, and mesh size, net length and depth for purse seine gear). Specific regulations also exist to limit bycatch of non-target species (these information are included in ADFG booklets such as the: '2008-2011 Chignik and Kodiak Areas Commercial Salmon Fishing Regulations', '2007-2010 Bristol Bay, Alaska Peninsula, Atka-Amilia, and Aleutian Island Areas Commercial Salmon Fishing Regulations', '2009-2012 William Sound Commercial Salmon Fishing Regulations', and '2008-2011 Cook Inlet Area Commercial Salmon Fishing Regulations' freely and widely available in Statewide Alaska ADFG offices). One area where questions regarding gear selectivity have arisen is the Yukon River gillnet fishery for Chinook salmon. Fishers are concerned that older and larger Chinook salmon are being selected for in the fishery and that some age-classes may be being removed from the population. This issue is being examined through the AYK Sustainable Salmon Initiative. http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf Takes of endangered species, e.g. Chinook from the Columbia River system, are minimized (e.g. by establishment of annual quotas in all SE commercial and sport fisheries that harvest Chinook salmon under the Pacific Salmon Treaty).

8.4.1	**Technical measures shall be taken in relation to:** **- fish size** **- mesh size or gear** **- discards** **- closed seasons** **- closed areas** **- areas reserved for particular (e.g. artisanal) fisheries** **- protection of juveniles or spawners** All gear types in Alaska are strictly regulated. Types of legal gear are listed in 5AAC 39.105. Specific requirement for gear (i.e. gillnet length, depth, and mesh sizes) are defined for each area and in specific management plans and regulations. For example, regulation 5 AAC 06.330 'Gear' in the Bristol Bay area: A) Salmon may be taken with set and drift gillnets only in districts described in 5 AAC 06.200. Salmon may be taken with set gillnets on the Northwest shore of Kvichak Bay from the Naknek-Kvichak district boundary south to 58˚43.80'N. lat., 157˚42.70' W. long. …etc. 5 AAC 06.331. 'Gillnet specifications and operations' in the Bristol Bay area. 1) Gillnet mesh size may not exceed five and one half inches during periods established by emergency order for the protection of chinook salmon; 2) gillnet mesh size may not be less than five and three-eights inches during the periods established by emergency order for the protection of pink salmon; 3) gillnet mesh size may not exceed four and three quarters inches during periods established by emergency order for the protection of sockeye and coho salmon; 4) gillnet mesh size may not be less than seven and one half inches during periods established by emergency order for the protection of sockeye salmon; 5) from 9:00 am June 15 to 9:00 am July 15, mesh size restrictions for the Togiak District are as provided in 5 AAC06.369(d); from June 1 through July 1, mesh size restrictions for the Egegik District are specified in 5 AAC 06.333, a person may not operate or assist in the operations of a drift gillnet exceeding 150 fathoms in length or a set gillnet exceeding 50 fathoms in length…etc. Also, mesh size is regulated in the various gill net fisheries from time to time during the fishing season to promote the catch of target species while preventing harvest of non-target salmon. In the case of Chinook salmon the SE and Yakutat troll and sport fisheries taking subadults are restricted to fish larger than 28 inches, smaller fish must be released. For troll fisheries regulations include:- 5AAC 29.140(a) Size limits, possession, and landing requirements. For sport fisheries: 5AAC 47.020(1). In terms of waste and discards, Alaska law prohibits "wanton waste", such as the discarding of salmon by salmon harvesters (AS 16.05.831,SF 75.065). Broad areas are designated for gear-specific fisheries, including artisanal fisheries, in regulation. Within these areas local area managers open and close sub-areas during the year depending on the abundance of fish and the progress toward escapement goals. For example, regulation 5 AAC 06.350 'Closed waters' describes the precise locations (lat, long) closed to the taking of salmon in the Nushagak, Naknek-Kvichak, Egegik, Ugashik and Togiak Districts...etc. Also, Local area managers open and close seasons during the year, within planned calendar dates, depending on the abundance of fish and the progress toward escapement goals, typically on a week to week basis.

	Harvest of juveniles is not permitted. Waters near spawning grounds are closed to fishing. In addition, section 16.10.010 'Interference with salmon spawning streams and waters' requires application for permit or license from ADFG if a person is to: 1) obstruct, divert or pollute waters of the state, either fresh or salt, utilized by salmon in the propagation of the species… 2) erect a dam, barricade, or obstruction to retard, conserve, impound, or divert the waters described in 1) of this subsection inaccessible or inhabitable for salmon for spawning or propagation…etc.
8.4.2	**Suitable arrangements in place to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques**. Gear types (e.g. purse seine, gill net, troll) and the manner of their fishing have been developed over time to be selective of target species and stocks. The gear is generally environmentally safe (not lost, not unattended, not in contact with the bottom, etc.) Market forces ensure that gear is cost effective. ADFG has conducted studies on the selectivity of certain gears (size and species of fish) as well as mortality of fish caught and released for troll and sport gears. For example see: http://www.adfg.state.ak.us/pubs/afrb/vol9_n1/2quanv9n1.pdf.

9. There must be defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels. ***FAO 7.1.8/7.4.3/7.6.3/7.6.6/7.6.10/8.4.5/8.4.6/8.5.1/8.5.3/8.5.4/8.11.1/12.10***						
Confidence Ratings	**Low**	**None**	**Medium**	**None**	**High**	**11 out of 11**

Clause:

9.1 Attempts shall be made to measure fleet capacity operating in the fishery.

9.1.1 Mechanisms shall be established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource.

FAO 7.1.8 /7.6.3

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	**Evidence**
9.1	In the early 1970s, the Alaska government realized that the state's salmon resources could not produce livelihoods for an increasing and unlimited number of fishermen and still be managed for maximum sustained yield. Then Governor Egan suggested the only alternative was to limit the number of permits issued for fishing (ADFG, 2009). 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 Alaska Commercial Fisheries Entry Commission (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 http://www.cfec.state.ak.us/. Participants in a fishery who believe the number of gear operators should be limited in order to preserve the resource and economic health of the fishery can initiate the limited entry process. If research by CFEC indicates limiting entry to the fishery would help solve the problem, the commission establishes a maximum number of permits for the fishery based upon historic participation levels. Next, CFEC develops a point system to rank eligible applicants according to the relative degree of hardship they would suffer if not awarded an entry permit. The basic criteria used to evaluate hardship are: establishing that economic dependence upon the fishery exists (which could include determining the percentage of income derived from the fishery and amount of investment in a vessel and gear); and past history of participation in the fishery, including the consistency and number of years that applicant participated. A person must have legally participated in the fishery, held the required licenses, and made at least one landing of fish during an eligible period prior to the established qualification date in order to qualify for that period. A specific application period, usually a few months in length, is established for each limited fishery. All persons who are eligible to

	apply must submit their applications during the specified time period. CFEC is continuing to study alternative types of limited entry for fisheries managed by a harvest quota. CFEC issues three basic types of permits: limited entry permits, interim-use permits, and vessel permits. Limited entry permits are the permanent permits issued for limited fisheries. They are issued to applicants who received a sufficient number of points on their applications. Limited entry permits must be renewed annually and most can be transferred to another person after initial issuance (e.g., sold, or inherited). Interim-use permits are issued annually for all commercial fisheries not under entry limitation, and to applicants waiting to find out if they qualify for permanent permits. Vessel permits (in contrast to vessel licenses) are issued annually for vessels qualified to participate in the Bering Sea hair crab or weathervane scallop fisheries http://www.cfec.state.ak.us/Publications/what_is_cfec.pdf. A limited entry or interim-use permit entitles the holder to operate gear in a specific commercial fishery in accordance with BoF regulations. The term "fishery" refers to a specific combination of fishery resource(s), gear type(s), and area(s). For example, Southeast salmon trolling, Cook Inlet salmon drift gillnetting and Chignik salmon seining are distinct fisheries, requiring separate permits. Permits for some species other than salmon are issued on a statewide basis; however, most are valid only for specific areas of the state (e.g., Southeast, Cook Inlet or Bristol Bay). This "right to fish" is embodied in a permit card that is issued annually.
9.1.1	**Mechanisms shall be established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource.** **Fleet capacity reduction.** Attempts have been made to measure fleet capacity in most of Alaska's salmon fisheries. In 2008, the Southeast Revitalization Association (SRA) 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. The SRA is a qualified salmon fishery association formed under the authority of AS 16.40.250 for the purpose of fleet consolidation. The SRA buy-back program was financed using $2.8 million in federal funds from appropriations to the Pacific Coast Salmon Recovery Fund. The buy-back program was conducted using a reverse auction system to achieve the greatest reductions in permits. The SRA is currently pursuing federal loan financing for an additional buy-back program. CFEC is open to considering any proposal within the limits of the law that would lead to improvements for Alaska salmon fishermen and their families http://www.cfec.state.ak.us/annrpts/AR2009.pdf. **Vessel size and gear limitations** Salmon purse seine vessels are limited in length in order to limit their fishing capability. State statutes (AS 16.05.835) restrict Alaska salmon purse seine vessels to 58 feet in overall length, with the exception of vessels that recorded salmon purse seine harvests prior to 1962. The State Legislature amended the law in 2004 to give the BoF the

	authority to adopt regulations allowing longer vessels in specific salmon seine fisheries; however, no such allowance has been made to date. Gillnet vessels are also limited by length in some salmon fisheries. Gear allowed for commercial fishing is restricted by BoF regulation by fishery. Examples include limitations on mesh size and gear length. Some gear types, including drum seines are banned by statute. As indicated in the previous section, the purpose of the Commercial Fisheries Entry Commission is to promote the economic health and stability of the commercial fishing industry in Alaska, as well as to promote the conservation and sustained yield management of fisheries resources. CFEC maintains a research section tasked with providing economic analyses and studies on fishery limitation for its commissioners and occasionally for the BoF. Recent research involved fleet consolidation and fishery restructuring in Kodiak, Bristol Bay and Southeast. CFEC provides data directly to 12 Alaska Regional Development Organizations that encourage and assist locally-driven economic development in areas that depend on commercial fishing as their economic base (2009 CFEC Annual Report) http://www.cfec.state.ak.us/annrpts/AR2009.pdf. The Alaska Sea Grant program provides economic assistance to fishers in part through the Alaska Fisheries Business Assistance Project, including an online Business Resource Guide for Alaska Fishermen that is a searchable database of organizations, agencies, and companies that provide services to individuals and businesses in the seafood industry http://seagrant.uaf.edu/map/fishbiz/.

Clause:

9.2 Measures shall be introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks.

FAO Main Criteria 7.6.10 Others 7.4.3

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.2	The biodiversity of aquatic habitats and ecosystems is safeguarded primarily by "clean" fishing practices and by sound fisheries management. Salmon fisheries in Alaska are generally gear, area and time specific, thus resulting in fairly species-specific harvests. For many fisheries, ADFG prepares fishery-specific management plans in advance of each salmon season. The Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) directs ADFG to report to the BoF on the status of salmon stocks and to Identify specific stocks that represent a concern based on yield, management, or conservation. Generally, review teams comprised of staff from the Commercial and Sport Fish Divisions examine escapement goals by region and report potential problems with stocks to the BoF at regularly scheduled meetings. ADFG has reported the following stocks of concern to the BoF at recent BoF meetings: Karluk River Chinook; Susitna River sockeye; Upper

Cook Inlet Chinook (Chuitna River, Lewis River, Theodore River, Alexander Creek, Willow Creek, and Goose Creek); Kvichak River sockeye; Yukon River Chinook; Norton Sound Chinook (Shaktoolik and Unalakleet subdistricts); Norton Sound chum (Nome, Golovin and Moses Point subdistricts); and McDonald Lake sockeye.

As an example, ADFG identified the McDonald Lake stock of sockeye salmon as a "stock of management concern." Based on ADFG recommendations, the BoF then adopted a McDonald Lake Sockeye Salmon Action Plan which required management action to reduce the harvest of these fish in the District 6 drift gillnet fishery as well as the purse seine fishery. In addition to these fishery management actions, restrictions were also placed on the Yes Bay personal use fishery. Research programs were to be implemented to evaluate returns to McDonald Lake and to further refine future management actions to rebuild the McDonald Lake sockeye run (Davidson, *et al.*, 2010).

ADFG management reports in other areas of the state also indicate that salmon fishery management safeguards the biodiversity of salmon by basing management on discrete stocks. For example, in Bristol Bay harvests are directed at terminal areas around the mouths of individual rivers. Each stock is managed to achieve an escapement goal for spawning (usually expressed as a range) based on the principle of sustained yield. ADFG manages fisheries to meet escapement goals by regulating fishing time and area. Legal gear for the Bristol Bay salmon fishery includes drift gillnets of a maximum of 150 fathoms and set gillnets of up to 50 fathoms in length. However, two permit holders are allowed to fish together on a single vessel with up to 200 fathoms of gillnet (Morstad *et al.*, 2010).

These actions indicate Alaskan salmon fisheries are specifically managed to maintain the biodiversity of fish stocks and thereby maintain marine aquatic ecosystems.

Management plans are based on ADFG annual preseason salmon forecasts, historical escapement data, fishery performance data, private non-profit hatchery forecasts, and input from various public Management Task Force processes. Specific area openings and fishing times are established in-season by emergency order. As an example, the 2010 Southeast Alaska Purse Seine Fishery Management Plan was developed by all the Southeast commercial fisheries area management biologists based on forecasts for pink salmon (including the NOAA forecast), together with historical escapement estimates, fishery performance data, private non- profit hatchery forecasts for chum salmon and abundance of other species (Davidson *et al.*, 2010). Pink salmon is the primary species targeted by this fishery, based on historic data showing that since statehood 77% of the salmon harvested in Southeast Alaska commercial fisheries have been caught with purse seine gear. Thus, most management actions in the fishery are based on the abundance of pink salmon stocks. Chum salmon are specifically targeted in or near hatchery terminal areas and the majority of the chum harvest originates from hatchery production. Other species of salmon are harvested incidentally to pink and chum salmon, as indicated by the fact that over the most recent 10-year period the purse seine harvest included 87% pink salmon, 11% chum salmon, 1.3% sockeye salmon, and 0.7% coho salmon.

Harvest percentages for Chinook salmon have been insignificant compared with other species. However, ADFG is required to manage the Southeast Alaska purse seine

	fishery for a maximum harvest of 4.3% of the annual all-gear Chinook salmon catch ceiling determined under the terms of the Pacific Salmon Treaty [5AAC 29.060 (b)(1)]. The BoF has adopted size limits [5AAC 33.392] and directed ADFG to manage the purse seine fishery such that incidental Chinook mortality from catch and release is minimized (Davidson *et al.*, 2010). In addition, tagging studies of adult pink salmon have demonstrated that the stocks in Southeast Alaska exhibit a distinct separation between the northern and southern portions of the region. Inseason assessments of pink salmon run strength are determined primarily from spawning escapement information obtained from aerial surveys of terminal areas and streams, and from fishery performance data (i.e., catch and catch per unit effort, or CPUE). ADFG staff use fishery performance data and associated information to make inseason evaluations of pink salmon harvests from both Northern and Southern Southeast Alaska. Staff also charter purse seine vessels to conduct test-fishing assessments of run strength in selected index areas and monitor pink salmon sex ratios in the commercial harvest to evaluate run timing.

Clause:

9.3 When deciding on use, conservation and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood.

FAO Main Criteria 7.6.6

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.3	Every year, many thousands of Alaskans participate in subsistence fishing and processing activities. These practices represent an important part of Alaska's social and cultural heritage, as well as a crucial component of the state's non-cash subsistence economy. From a social perspective, rural subsistence users have the highest priority in the allocation of fisheries resources. State statutes (AS 16.05.258) indicate that "if the harvestable portion of the stock or population is sufficient to provide for subsistence uses, but no other consumptive uses, the appropriate BoF shall determine the portion of the stocks or populations that can be harvested consistent with sustained yield; and adopt regulations that eliminate other consumptive uses in order to provide a reasonable opportunity for subsistence uses; and if the harvestable portion of the stock or population is not sufficient to provide a reasonable opportunity for subsistence uses, the appropriate BoF shall adopt regulations eliminating consumptive uses, other than subsistence uses." Subsistence fishing in Alaska is critical to the cultural and economic well being of more than 100,000 Alaska Natives and non-Natives living in rural Alaska. The average rural subsistence harvest of fish and wildlife in Alaska is about 375 pounds of food per person per year. That is more than the U.S. average consumption of 255 pounds of domestic meat, fish, and poultry per year. Nowhere else in the United States is there

	such a heavy reliance upon wild food. However, only about 4% of the fish harvested in Alaska is used for subsistence purposes http://seagrant.uaf.edu/map/fisheries/index.html. Management of most subsistence fishing in fisheries managed by the state is done by ADFG, Division of Commercial Fisheries. Each year, the Division of Commercial Fisheries prepares “annual management reports” (AMRs) for most fishery management areas in the state. Although the AMRs focus primarily on commercial fisheries, most also routinely summarize basic harvest information for subsistence fisheries. In Northwest Alaska and for the Yukon and Kuskokwim Rivers, more detailed annual reports about subsistence fisheries harvest assessment programs are prepared (ADFG, 2005). Management of subsistence fishing in Alaska became more complex in 1990 when the federal government began managing subsistence hunting, trapping, and fishing on Alaska's federal public lands and non-navigable waters, and again in 1999, when federal subsistence management expanded to include fisheries on all federal public lands and waters http://alaska.fws.gov/asm/about.cfml. The Federal Subsistence Board is the decision-making body that oversees the Federal Subsistence Management Program. It is made up of the regional directors of the U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Bureau of Indian Affairs, the U.S. Forest Service, and a chairman appointed by the Secretaries of the Interior and Agriculture. The Federal Subsistence Management Program is a multi-agency effort to provide the opportunity for a subsistence way of life for rural Alaskans on federal public lands and waters while maintaining healthy populations of fish and wildlife. This dependence on wild resources is cultural, social and economic. Alaska's indigenous inhabitants have relied upon the traditional harvest of wild foods for thousands of years and have passed this way of life, its culture, and values down through generations. Subsistence has also become important to many non-Native Alaskans, particularly in rural Alaska http://alaska.fws.gov/asm/about.cfml. The federal program provides for public participation through the Federal Subsistence Board and 10 Regional Advisory Councils. The Regional Advisory Councils provide recommendations and information to the Board; review proposed regulations, policies and management plans; and provide a public forum for subsistence issues. Each Council consists of residents who are knowledgeable about subsistence and other uses of fish and wildlife resources in their region. Another element of the Federal subsistence program is fisheries research and monitoring. The program supports and funds research and monitoring projects that provide information needed for subsistence fisheries management and to ensure that regulatory decisions are based upon sound science. The Federal Subsistence Board, Regional Advisory Councils and fishery managers use this information when making regulatory decisions. Projects funded by the program are carried out by numerous organizations, including State and Federal government agencies, universities, Alaska Native and rural organizations, and private contractors http://alaska.fws.gov/asm/about.cfml.

Clause:

9.4 States and relevant groups from the fishing industry shall encourage the development and implementation of technologies and operational methods that reduce discards.

FAO Main Criteria 8.4.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.4	Operation of all salmon fishing gear (purse seines, gillnets, and troll gear) is required to minimize incidental harvest of non-target species. Time and area restrictions limit when and where specific fisheries occur and restrictions are also imposed by regulation on all types of fishing gear (e.g., mesh size restrictions and length of nets for gillnets, number of fishing lines, rods, and gurdies for troll gear, and mesh size, net length and depth for purse seine gear). Specific regulations also exist to limit bycatch of non-target species. One area where questions regarding gear selectivity have arisen is the Yukon River gillnet fishery for Chinook salmon. Fishers are concerned that older and larger Chinook salmon are being selected for in the fishery and that some age-classes may be being removed from the population. This issue is being examined through the AYK Sustainable Salmon Initiative http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf. Alaska law (AS 16.05.831) prohibits waste of salmon harvested in all Alaska fisheries. This statute does allow the commissioner of ADFG, upon request, to "authorize other uses of salmon that would be consistent with maximum and wise use of the resource." In some specific cases involving the Prince William Sound pink salmon fishery, the commissioner has allowed the carcasses of pink salmon to be discarded after the roe was removed because the fish were otherwise not saleable and, because they were of hatchery origin, ADFG did not want the fish to stray into wild stock spawning streams in areas around the hatcheries. This practice did occur in the past, but is not allowed now. The fish are now sold to processors who strip the roe and then render the carcass into fish meal. Hatcheries are not allowed to strip the roe and discard the fish. The NPAFC, made up 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 fish, in the high seas area of the North Pacific Ocean that are beyond national boundaries. The NPAFC coordinates high seas fishery enforcement activities by member countries 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 focuses on trends in marine production of salmon stocks, their population structure and diversity in marine ecosystems of the North Pacific, and climate change impacts. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf.

	The NPFMCworks closely with ADFG and the BoF to coordinate fishery management programs in state and federal waters off Alaska to address fish habitat concerns, catch limits, allocation issues and other management issues. The enabling legislation for the NPFMC process was the 1976 Fishery Conservation and Management Act (aka Magnuson-Stevens Act) which was intended to: prevent overfishing; base fishery decisions on the best science; manage individual stocks throughout their range; allocate fairly between residents of different states; promote efficiency, minimize costs and avoid duplication; take into account the importance of fishery resources to communities and minimize adverse impacts to them; and minimize bycatch of non-target species and the fishing mortality associated with it.

Clause: **9.5 Technologies, materials and operational methods shall be applied to minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear.** ***FAO Main Criteria 8.4.6***	
Evidence adequacy rating: **☑ High** **☐ Medium** **☐ Low**	
Clause:	**Evidence**
9.5	Lost or abandoned salmon fishing gear has been addressed in at least one Alaskan salmon fishery. State fishery regulation 5 AAC 06.331 (t) states "A permit holder fishing in the Bristol Bay Area must report the loss of a gillnet, or portion of a gillnet, to the local ADFG office in Dillingham or King Salmon within 15 hours of the loss of the gillnet, or portion of the gillnet. For the purposes of this section, the report must be made directly to a local representative of ADFG in person or by radio or telephone." The ghost fishing effect of lost fishing gear does not appear to be a major problem in other salmon fisheries; however, it is a more recognized problem with pot-type gear used for crab and some bottom-fish fisheries. Specific requirements are in place for those fisheries that require the inclusion of escapement devices in the construction of pots used in personal use as well as commercial fisheries.

Clause:

9.6 There shall be a requirement that fishing gear, methods and practices where practicable, are sufficiently selective as to minimize waste, discards, and catch of non-target species - both fish and non-fish species and impacts on associated or dependent species.

9.6.1 The intent of related regulations shall not be circumvented by technical devices and information on new developments and requirements shall be made available to all fishers.

FAO Main Criteria 8.5.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.6	Operation of all salmon fishing gear (purse seines, gillnets, and troll gear) is required to minimize incidental harvest of non-target species. Time and area restrictions limit when and where specific fisheries occur and restrictions are also imposed by regulation on all types of fishing gear (e.g., mesh size restrictions and length of nets for gillnets, number of fishing lines, rods, and gurdies for troll gear, and mesh size, net length and depth for purse seine gear). Specific regulations also exist pertaining to bycatch of non-target species. For example, for the troll fishery in the state waters of the Eastern Gulf of Alaska, all groundfish incidentally taken by hand and power troll gear may be legally taken and possessed with the following restrictions: (1) The bycatch allowance for demersal shelf rockfish (DSR) is limited to 10% of the round weight of all salmon on board the vessel. All DSR in excess of 10% must be weighed and reported as bycatch overage on an ADFG fish ticket. All proceeds from the sale of excess DSR bycatch taken in state waters shall be surrendered to the state [5 AAC 28.171 (a)]. The seven species of rockfish in the DSR assemblage are yelloweye, quillback, canary, rosethorn, copper, china, and tiger rockfish. DSR bycatch overages must be reported on fish tickets but may be kept for a person's own use. (2) The bycatch allowance for spiny dogfish in state waters is limited to 35% of the round weight of salmon on board the vessel. (3) Lingcod may be taken as bycatch in the commercial salmon troll fishery only from May 16 through November 30 [5AAC 28.113 (c)]. (4) Lingcod must measure at least 27 inches from the tip of the snout to the tip of the tail, or 20.5 inches from the front of the dorsal fin to the tip of the tail. (5) The 2010 commercial troll lingcod allocation has been harvested in the Icy Bay Subdistrict (IBS) and the Northern Southeast Outside (NSEO) Section and these areas are closed to lingcod retention for the remainder of the season. Lingcod allocation remains available for the fall portion of the winter troll fishery in the Central Southeast Outside (CSEO) Section, Southern Southeast Outer Coast (SSEOC) Sector, Northern Southeast Inside (NSEI) Subdistrict, and the Southern Southeast Internal Waters (SSEIW) Sector. Lingcod bycatch may be retained in these areas in unlimited amounts until area allocations are taken or November 30, whichever occurs first. (6) The retention of lingcod is prohibited in the troll fishery in the waters of Sitka Sound [5AAC 28.150(a)]. The Sitka Sound closure area is defined as the waters that are enclosed on the north by lines from Kruzof Island at 57°20.50' N. lat., 135°45.17' W. long. to

Chichagof Island at 57°22.05' N. lat., 135°43.00' W. long., and from Chichagof Island at 57°22.58' N. lat., 135°41.30' W. long. to Baranof Island at 57°22.28' N. lat., 135°40.95' W. long., and on the south and west by a line running from the southernmost tip of Sitka Point at 56°59.38' N. lat., 135°49.57' W. long. to Hanus Point at 56°51.92' N. lat., 135°30.50' W. long. to the green day marker in Dorothy Narrows at 56°49.28' N. lat., 135°22.75' W. long. to Baranof Island at 56°49.28' N. lat., 135°22.60' W. long.

Lingcod harvest allocations for the troll fishery are set by Lingcod Management Area and area closures will occur as allocations are taken. Inseason closures will be announced by news release and marine radio broadcast by the United States Coast Guard and National Weather Service.

(8) Halibut incidentally taken during an open commercial halibut season by power and hand troll gear being operated for salmon consistent with applicable state laws and regulations are legally taken and possessed [5AAC 28.133 (c)]. Only IFQ permit holders may legally retain commercial halibut during the open season for halibut. Trollers making an IFQ halibut landing of 500 lbs or less of IFQ weight as determined pursuant to 50 CFR 679.42(h) are exempted from the 3 hour Prior Notice of Landing (PNOL) if landed concurrently with a legal landing of salmon [50 CFR 679.5(l)(1)(iv)(A)]. Halibut taken incidentally during the troll fishery shall be reported on an ADFG fish ticket using the CFEC salmon permit. For information on regulations and landing requirements for the federal IFQ halibut fishery contact the NMFS.

(9) Trollers are allowed to longline for groundfish and troll for salmon on the same trip as long as fish are not onboard the vessel in an area closed to commercial fishing or closed to retention of that species and the fisher has both a commercial salmon permit and the appropriate commercial longline permit.

(10) A vessel may not participate in a directed fishery for groundfish with dinglebar troll or mechanical jig gear if they have commercial caught salmon on board. A vessel fishing for groundfish with dinglebar troll gear must display the letter “D” and a vessel fishing for groundfish with mechanical jigging machines must display the letter “M” at all times when fishing with or transporting fish taken with dinglebar troll gear or mechanical jigging machines [5AAC 28.135 (a)(4)]. A person may not operate a vessel that is displaying one of these letters when the vessel is being used to fish for salmon [5AAC 28.135 (c)] (Skannes and Hagerman, 2010).

These very detailed and specific restrictions are included to demonstrate how thorough and conclusive the fisheries management regime in Alaska is in its intent to minimize impacts from fishing on non-target species and to safeguard target species and stocks from over harvest.

State law prohibits waste of salmon harvested in all Alaska fisheries (AS 16.05.831). This statute does allow the commissioner of ADFG, upon request, to “authorize other uses of salmon that would be consistent with maximum and wise use of the resource.” In some specific cases involving the Prince William Sound pink salmon fishery, the commissioner did allow the carcasses of pink salmon to be discarded after the roe was removed because the fish were otherwise not saleable.

The NPFMC has adopted measures over the years to control bycatch of salmon in trawl fisheries. Salmon are listed as prohibited species in the groundfish management plans, meaning they cannot be retained and sold. Regulations promulgated in 1994 prohibit the

	discard of salmon taken as bycatch in the Bering Sea/ Aleutian Islands (BSAI) trawl fisheries until the number has been determined by a certified observer. Subsequent regulations allow retention of salmon for donation to foodbanks. Salmon bycatch in the BSAI trawl fisheries is not considered a conservation issue for Western Alaska stocks of chum salmon; however, fishery managers remain concerned about bycatch of Chinook from small Western Alaska stocks (Witherell, D., D. Ackley and C. Coon. 2002. An overview of salmon bycatch in Alaska groundfish fisheries. AK Fish Res Bull 9(1):53-64). ADFG participates in research programs on an international basis with other entities on issues such as fishing gear selectivity and improvements to fishing methods and strategies. Results of such research and technology transfer are disseminated through entities such as the NPAFC. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYKSSI) was established to collaboratively develop and implement a comprehensive research plan to understand causes of the decline in and recovery of AYK salmon stocks. AYKSSI has funded 55 research projects with over $20 million in funding. Included in this effort are research projects on salmon genetics, selectivity in fisheries, and escapement goals http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf.
9.6.1	**The intent of related regulations shall not be circumvented by technical devices and information on new developments and requirements shall be made available to all fishers.** Salmon fisheries in Alaska are managed in accordance with the state constitution, which states that, except for limited entry, there will be no exclusive right or special privilege of fishery. Therefore, regulations promulgated by the BoF apply equally to all users of the resource in the state. Furthermore, fishery regulations in Alaska are extremely detailed with regard to the configuration of acceptable gear for use in each fishery. For example, statewide regulation 5 AAC 39.250 states gillnet web must contain at least 30 filaments, except that (1) in the Southeast Alaska, Yakutat, Prince William Sound, and Cook Inlet areas, gillnet web must meet one of the following requirements: (a) the web must contain at least 30 filaments and all filaments must be of equal diameter, or (b) the web must contain at least six filaments, each of which must be at least 0.20 millimeter in diameter; (2) the requirements contained in (1a) and (1b) of this subsection apply in the Kodiak, Chignik, Aleutian Islands, Alaska Peninsula, Bristol Bay, Kuskokwim, Yukon-Northern, Norton Sound-Port Clarence, and Kotzebue Areas. In addition, the float line and floats of gillnets must be floating on the surface of the water while the net is fishing, unless natural conditions cause the net to temporarily sink. The restriction of this subsection does not apply in the Kotzebue Area, the Norton Sound-Port Clarence Area, the Yukon-Northern Area, the Kuskokwim Area, and the Kodiak Area. In the Southeastern Alaska Area, gillnet mesh size is measured by averaging the length of five consecutive meshes measured from inside the first knot and including the last knot when wet. The five meshes being measured must be an integral part of the net, as hung,

	and measured perpendicular to the selvages. Measurements must be made by means of a metal tape measure while the five meshes are suspended vertically from a single peg or nail, under a one-pound weight. For Alaskan fisheries everything from boat length to gear allowed is specified in BoF regulation. When a technical device or modification in gear is proposed, the BoF thoroughly examines the issue and either approves its use, usually on a fishery-by-fishery basis, or prohibits it. For example, use of drum seines in Alaska is prohibited (5 AAC 39.155).

Clause:

9.7 International cooperation shall be encouraged with respect to research programs for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology.

FAO Main Criteria 8.5.4

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.7	ADFG has participated in research programs on an international basis with other entities on issues such as fishing gear selectivity and improvements to fishing methods and strategies. Results of such research and technology transfer are disseminated through entities such as the NPAFC. The NPAFC, made up of representatives from Canada, Japan, Korea, Russia, and the United States (including Alaska), serves as a forum 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. In addition, the NPAFC serves as a venue for coordinating the collection, exchange, and analysis of scientific data regarding these species. It also coordinates high seas fishery enforcement activities by member countries 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 focuses on trends in marine production of salmon stocks, their population structure and diversity in marine ecosystems of the North Pacific, and on climate change impacts. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYKSSI) was established to collaboratively develop and implement a comprehensive research plan to understand causes of the decline in and recovery of AYK salmon stocks. AYKSSI has funded 55 research projects with over $20 million in funding. Included in this effort are research projects on salmon genetics, selectivity in fisheries, and escapement goals http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf.

Clause:

9.8 States and relevant institutions involved in the fishery shall collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies.

FAO Main Criteria 8.5.3/12.10

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.8	ADFG has participated in research programs on an international basis with other entities on issues such as fishing gear selectivity and improvements to fishing methods and strategies. Results of such research and technology transfer are disseminated through entities such as the NPAFC. The NPAFC, made up of representatives from Canada, Japan, Korea, Russia, and the United States (including Alaska), serves as a forum 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. In addition, the NPAFC serves as a venue for coordinating the collection, exchange, and analysis of scientific data regarding these species. It also coordinates high seas fishery enforcement activities by member countries 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 focuses on trends in marine production of salmon stocks, their population structure and diversity in marine ecosystems of the North Pacific, and on climate change impacts. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The Commercial Fisheries Entry Commission analyses the economic viability of Alaskan salmon fisheries and assesses the effects of suggested changes in fishing methods and strategies on them. Any changes in fishing methods or means must be implemented by the BoF. In the recent past, the BoF has instituted changes in fisheries that allowed a cooperative seine fishery in Chignik (since found to be unconstitutional) and multiple permit holders to fish gillnets from the same vessel at the same time in several fisheries in the state. The Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYKSSI) was established to collaboratively develop and implement a comprehensive research plan to understand causes of the decline in and recovery of AYK salmon stocks. AYKSSI has funded 55 research projects with over $20 million in funding. Included in this effort are research projects on salmon genetics, selectivity in fisheries, and escapement goals http://www.aykssi.org/Documents/AYKbsfa-0210_REPORT.pdf.

Clause:

9.9 Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures, placed with due regard to the safety of navigation.

FAO Main Criteria 8.11.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
9.9	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. The addition of large woody debris (LWD) to fresh water streams that produce salmon is a much more important and ecologically valuable activity in Alaska, especially in the Southeast and Southcentral regions. Rehabilitation of streams important for rearing of juvenile salmon by placing LWD into those streams is an increasingly popular technique for improving fish and wildlife habitat. It provides velocity refuge and overhead cover for fishes, substrate for aquatic invertebrates, and can be an important source of particulate organic matter adding to primary productivity of a stream. Large woody debris also plays a major role in stream channel morphology, contributing to formation of pool habitat, increasing meandering, and increasing sediment capacity. Large woody debris dissipates flow energy, resulting in improved fish migration and channel stability. Rehabilitation of riparian habitat and stream morphology through the use of artificial structures and revegetation also occurs http://ir.library.oregonstate.edu/xmlui/handle/1957/9757; http://ddr.nal.usda.gov/bitstream/10113/33736/1/IND44251289.pdf.

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

FAO 8.1.7/8.1.10/8.2.4/8.4.5

Confidence Ratings	Low	None	Medium	None	High	4 out of 4

Clause:

10.1 States shall enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.

FAO Main Criteria 8.1.7

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
10.1	The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska's Institute of Technology). One of AVTEC's main divisions is the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training (STCW is the international Standards of Training, Certification, & Watchkeeping). In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of their world class ship simulator, state of the art computer based navigational laboratory, and modern classrooms equipped with the latest instructional delivery technologies. The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's continually evolving maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals. The Center's course offerings include – Video Tutorials – * How to get your Merchant Mariner's Credential * Which Course Do You Need? U.S. Coast Guard Approved/STCW-Compliant Courses – * Able Seaman * Assistance Towing Operations * Automatic Radar Plotting Aids (ARPA) Operations * Basic Safety Training - STCW'95; includes:

** First Aid & CPR
** Personal Safety and Social Responsibility
** Basic Fire Fighting
** Personal Survival Techniques
* Bridge Resource Management (BRM)
* Global Maritime Distress & Safety System (GMDSS)
* Master Not More Than 200 Tons Program
* Meteorology
* Operator of Uninspected Passenger Vessels (OUPV)
* Proficiency in Survival Craft
* Qualified Member of Engine Department (QMED) Oiler
* Radar Observer (Unlimited), Original
* Radar Observer (Unlimited), Refresher
* Radar Observer (Unlimited), Recertification
* Rating Forming Part of a Navigational Watch
* Seafood Processor Orientation and Safety Course
* Shipboard Emergency Medicine
* Tankship – Dangerous Liquids (P.I.C.)
* Visual Communications/Flashing Lights
* Medical Care Provider

Additional AVTEC Maritime Courses

* FCC Marine Radio Operators Permit Examination

The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several other sectors, including –

* better process control
* HACCP (Hazard Analysis / Critical Control Point)
* sanitation control procedures
* marine refrigeration technology
* net mending
* icing & handling
* direct marketing
* financial management for fishermen
* maximizing fuel efficiency

In addition, MAP 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, to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities.

Additional education is provided by the Fishery Industrial Technology Center, in Kodiak, Alaska.

Sources of evidence –

http://www.avtec.edu/AMTC.htm
http://www.stcw.org/
http://seagrant.uaf.edu/map/
http://seagrant.uaf.edu/map/fishbiz/index.php
http://www.sfos.uaf.edu/fitc/academicprograms/

Clause:

10.2 States, with the assistance of relevant international organizations, shall endeavor to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the Code, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.

FAO Main Criteria 8.1.10

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
10.2	The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. In addition, MAP 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. While there is not much education and training which explicitly deals with the Code, the Alaska fishery management process itself is an excellent *de facto* educational process. Alaska's fisheries are extremely compliant with the Code, as demonstrated by the Alaska Seafood Marketing Institute's checklist. Therefore, anyone who seeks to understand Alaska's fisheries management process unavoidably ends up becoming very familiar with the Code. Sources of evidence – http://seagrant.uaf.edu/map/ http://sustainability.alaskaseafood.org/fao Alaska fisheries management such as through the cycle of BoF meetings provides an open process by which fishers can witness management proceedings and listen and become educated with the fishery issues of the day specific to each region. Fishers can also participate in this process though a formal but yet explained process. Advisory Committees are made of stakeholders in each region and all meetings are held in public forum for fishers and stakeholders to witness- and thereby become educated. ASMI provide educational type information across a whole range of fishery and fish related matters – quality, hygiene, food safety, sustainability, environmental protection. Annual meetings are held which present the promotional activities of ASMI. ADFG publish a myriad of documents, booklets and pamphlets which provide information on Alaska salmon- from regulations to educational items to news stories which were reviewed and collected during on-site visits to ADFG and AWT Offices.

Clause:

10.3 Fishing gear shall be marked in accordance with national legislation in order, that the owner of the gear can be identified. Gear marking requirements shall take into account uniform and internationally recognizable gear marking systems.

FAO Main Criteria 8.2.4

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
10.3	By law (Alaska Statues, or AS), all Alaska 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 (Alaska Administrative Code, or AAC), which are specific to each fishing region. Also, there are region-specific regulations which require how salmon fishing vessels 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 that it is very unlikely that any fishing gear will be encountered by vessels of other nations. *Sources of evidence* – AS 16.05.510. Unlicensed vessel unlawful AS 16.05.520. Number plate 5 AAC 06.334. Identification of gear 5 AAC 06.343. Vessel identification

Clause:

10.4 States and relevant groups from the fishing industry shall be encouraging the development and implementation of technologies and operational methods that reduce discards.

***FAO Main Criteria* 8.4.5**

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
10.4	There are four types of fishing gear used in Alaska salmon fisheries - troll (hook & line), gill net, purse seine and fish wheel. There has been no significant development of fishing gear for many years, whether such developments are intended to reduce discards or for some other purpose. This is because those gear types are already fished in ways which minimize discards. The construction of the gear is tightly regulated; for example, monofilament gillnets and purse seines are prohibited; only multifilament gear may be used. The length and depth of gillnets is specified for each region. Sunken gillnets are prohibited, all gillnets must be at the water surface. Purse seines are regulated in their depth, length, and mesh size. Troll gear (which is used only in Southeast Alaska: Region 1) is limited in the number and deployment of hooks. Fish wheels must operate under regulatory specifications and operations. All gear deployments (fishing operations) are tightly controlled, in both time and space. The result is that there is limited (but managed

	through regulations) bycatch in any Alaska salmon fishery. Please refer back to section 9.6 for more details on bycatch management, allowance and regulation. Further, Alaska law prohibits "wanton waste", such as the discarding of salmon by salmon fishermen. Alaska salmon fishermen usually land all of their catch. *Sources of evidence* – 5 AAC 06.334. Identification of gear 5 AAC 29.120. Gear specifications and operations (troll) 5 AAC 39.170. Monofilament purse seine web unlawful 5 AAC 39.250. Gillnet specifications and operations 5 AAC 39.260. Seine specifications and operations 5 AAC 39.280. Identification of stationary fishing gear 5 AAC 39.265. Retention of salmon taken in a commercial net fishery AS 16.05.831. Waste of salmon AS = Alaska Statutes (laws); AAC = Alaska Administrative Code (regulations)

E. Implementation, Monitoring and Control

11. An effective legal and administrative framework must be established and compliance ensured through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction. ***FAO 7.1.7/7.7.3/7.7.5/7.6.2/8.1.1/8.1.4/8.2.1*** ***ECO 29.5***

Confidence Ratings	Low	None	Medium	None	High	3 out of 3

Clause:

11.1 Effective mechanisms shall be established for fisheries monitoring, surveillance, control and enforcement to ensure compliance with the conservation and management measures for the fishery in question

FAO Main Criteria7.1.7 Others 7.7.3/8.1.1/29.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
11.1	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 time and area based on observed escapements, commercial fishery performance (e.g., catch per unit of effort), test fishing, biological data on age, sex and size, historical run timing curves and other data. Each year, commercial fishery managers issue over 700 emergency orders to adjust fishing time and area based on inseason fishery performance and their best professional judgment in order to achieve escapement goals, while still providing an orderly harvest of high quality salmon. 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 actually watch 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. ADFG has instituted an on-going training and refresher class to keep deputized staff up-to-date on enforcement techniques. The Division of Wildlife Troopers in the Department of Public Safety is charged with protecting the state's natural resources through reducing illegal harvest, waste and illegal sale of commercially and sport harvested fish, and by safeguarding fish and wildlife habitat http://www.dps.state.ak.us/AWT/mission.aspx. The troopers mission also includes enforcement of boating safety. Wildlife Troopers cover all areas of the state with detachments and/or posts in the communities of Southeast (Klawock, Haines, Hoonah, Juneau, Sitka, Petersburg,

	Ketchikan, and Wrangell), Southcentral (Anchorage, Palmer, Big Lake, Soldotna, Anchor Point, Seward, Girdwood, Cordova, Valdez, Glennallen and Talkeetna), Western (Kodiak, King Salmon, Dillingham, Dutch Harbor, Iliamna, and Cold Bay), and Northern Alaska (Fairbanks, Coldfoot, Cantwell, Bethel, Aniak, McGrath, Nome, Delta, Tok, Galena, and St. Mary's). The troopers in these locations have numerous patrol vessels, small watercraft, fixed–wing aircraft, helicopters, trucks, snow-machines, and all-terrain-vehicles for use in meeting their law enforcement responsibilities http://www.dps.state.ak.us/AWT/detachments.aspx. Similarly to ADFG Area Biologists, the presence of Wildlife Troopers in all major and many minor communities in the state provides them almost immediate opportunity to monitor fishing activities across the state. ADFG and AWT inspect the catch and landing records of both harvesters and processers, and monitor the fishing permits required of harvesters and their crew members. The U.S. Coast Guard (USCG) also enforces boating safety laws and fishing vessels are often under surveillance by AWT and the USCG during fishing operations. The 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 land. USCG and AWT enforcement efforts are generally focused on violations that would do harm to the resource or those that create an unfair economic advantage to the violator. Trends in the incidence of these types of violations are monitored closely. The objective of regulatory enforcement is to ensure compliance. An important element of this effort is maintenance of the public perception that a high level of patrol and enforcement activity is occurring. The cooperation of the public and fishing industry is further cultivated through programs such as AWT's Fish and Wildlife Safeguard program, which encourages the reporting of fish and wildlife violations and increases the outreach of enforcement agencies http://www.dps.state.ak.us/AWT/safeguard.aspx. For fisheries under federal management, the NOAA Fisheries Office for Law Enforcement (OLE) enforces federal laws that protect and conserve Alaska's living marine resources and their habitat. OLE agents and enforcement officers have specific authority to enforce over 37 federal statutes as well as international treaties related to the conservation and protection of marine resources. OLE boards fishing vessels at sea, inspects fish processing plants, reviews sales of wildlife products on the internet, and conducts patrols on land, in the air and at sea.

Clause:
11.2 Fishing vessels shall not be allowed to operate on the resource in question without specific authorization.

FAO Main Criteria 7.6.2 Other 8.2.1

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Clause:	Evidence
11.2	The Alaska Limited Entry system only allows legally permitted vessels to operate in salmon fisheries. The "right to fish" is embodied in a permit card that is issued annually. The Alaska Legislature passed legislation in 1973 to establish a "limited entry" system to allow the state to limit the number of participants in specific 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." The Alaska Commercial Fisheries Entry Commission (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 http://www.cfec.state.ak.us/. Commercial salmon fishing vessels are not allowed to operate in a fishery without a person onboard who has in his or her possession a limited entry permit card. A limited entry or interim-use permit entitles the holder to operate gear in a specific commercial fishery in accordance with BoF regulations. The term "fishery" refers to a specific combination of fishery resource(s), gear type(s), and area(s). For example, Southeast salmon trolling, Cook Inlet salmon drift gillnetting and Chignik salmon seining are distinct fisheries, requiring separate permits. Permits for some species other than salmon are issued on a statewide basis, while others are valid only for certain areas of the state (e.g., Southeast, Cook Inlet and Bristol Bay). This "right to fish" is embodied in a permit card that is issued annually. Commercial fishing vessels must have a placard with the vessel identification number clearly visible on both sides of the vessel in symbols at least 12 inches high and one inch wide that contrast with the background color (5 AAC 39.119). Commercial charter vessels carrying and guiding sport fishers also must have specific authorization in the form of: (1) a current Alaska Sport Fish License (and a king salmon stamp if applicable), (2) a current U.S.C.G. Operator's license if operating a motorized vessel on navigable waters (determination of navigable waters is made by the U.S. Coast Guard), and a current first aid card. Sport fishing guide businesses must also have a sport fishing operator's license, and the actual guide or charter operator must have a guide license (AS 16.40.260 and AS 16.40.270). Fishing guides must also be residents of the United States, Canada, Mexico or resident aliens. Guides operating on the Kenai River must meet additional qualifications including attending a one-week orientation class. The NPFMC has established a limited entry program for the halibut sport charter industry operating in Southeast and Southcentral Alaska that is expected to be instituted in 2011.

Clause:

11.3 States involved in the fishery shall, in accordance with international law, within the framework of subregional 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.

FAO Main Criteria 8.1.4 Other 7.7.5

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
11.3	The NPAFC, made up 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 fish, 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 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 focuses on trends in marine production of salmon stocks, their population structure and diversity in marine ecosystems of the North Pacific, and on climate change impacts. New genetic and otolith marking techniques developed by the member states are being used to identify the origins of salmon and intermixing of the stocks in the North Pacific Ocean. In addition, new high tech tags are being used to track the migratory behavior of salmon on the high seas http://www.nmfs.noaa.gov/ia/intlagree/docs/NPAFC_IA_BOOK.pdf. The NPFMC works closely with ADFG and the BoF to coordinate fishery management programs in state and federal waters off Alaska to address fish habitat concerns, catch limits, allocation issues and other management issues. The enabling legislation for the NPFMC process was the 1976 Fishery Conservation and Management Act (aka Magnuson-Stevens Act) which was intended to: prevent overfishing; base fishery decisions on the best scientific data; manage individual stocks throughout their range; allocate fairly between residents of different states; promote efficiency, minimize costs and avoid duplication; take into account the importance of fishery resources to communities and minimize adverse impacts to them; and minimize bycatch of non-target species and the fishing mortality associated with it. Alaska also participates in the Pacific Salmon Treaty Process through its membership, along with other U.S. states, the U.S. federal government and Canada, on the Pacific Salmon Commission (PSC). The PSC is the body formed by the governments of Canada and the United States to implement the Pacific Salmon Treaty. The Commission gives both countries a forum through which to resolve their difficult salmon management problems http://www.psc.org/index.htm.

12. There must be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations ***FAO 7.7.2/8.2.7***						
Confidence Ratings	**Low**	**None**	**Medium**	**None**	**High**	**4 out of 4**

Clause:

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

12.1.1 Sanctions shall be in force that affect authorization to fish in the event of non-compliance with conservation and management measures.

FAO Main Criteria 7.7.2

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
12.1	Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5). These laws and regulations are enforced by the Alaska Department of Public Safety, Alaska State Troopers, Division of Wildlife Troopers (AWT). AWT coordinates with, and is supported by, law enforcement personnel from 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 land. Here below are presented some of the statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation. 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 Misdemeanor commercial fishing penalties AS 16.05.896 Penalty for causing material damage 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 ***sources of evidence –***

	Alaska Statutes Title 16 (laws) Alaska Administrative Code Title 5 (regulations) http://www.cf.adfg.state.ak.us/ http://www.dps.state.ak.us/awt/ http://www.nmfs.noaa.gov/ole/ http://www.uscg.mil/d17/
12.1.1	**Sanctions shall be in force that affect authorization to fish in the event of non-compliance with conservation and management measures.** AWT uses significant resources in its missions – ***Personnel Resources*** * 97 commissioned AWT Troopers * 89 certified commissioned boat operators * Commissioned boat operators pass certification exams * 21 Public Safety Technician II - Conduct dockside boardings of federal fisheries vessels under agreement with National Marine Fisheries * 16 Public Safety Technician I – seasonal technicians that assist troopers with vessel operations and maintenance * 14 Boat Operators – civilian employees permanently assigned to operations of larger vessels between 42 ft and 156 ft * Civilian captains and mates are all Coast Guard licensed ***Vessel Resources*** * 45 vessels in total that are used for commercial fisheries enforcement * Vessels range is size from 18 ft day skiffs to a 156 ft high seas enforcement vessel * 156 ft vessel stationed in Dutch Harbor, 121 ft vessel and 65 ft vessel stationed in Kodiak, 69 ft vessel stationed in Ketchikan and 42 ft vessel stationed in Cordova * Various 26 ft – 33 ft medium vessels stationed throughout Southeast Alaska, Prince William Sound, Kenai Peninsula, Kodiak Island and the Alaska Peninsula that are used for multi-day commercial fisheries patrols * Larger vessels (42 ft -156 ft) fully equipped with pot pulling capabilities ***Aircraft Resources*** * 22 Piper PA-18 Super Cubs, 10 on floats * 6 Cessna 185, 3 on floats * 1 Cessna 206 * 2 Cessna 208 Caravans * 1 Beechcraft King Air equipped with infra-red photo equipment * 3 Robinson R-44 helicopters, 2 on floats * 1 turbine helicopter equipped with infra-red photo equipment ***Patrol Missions*** * In-river gill net salmon fisheries using smaller vessels, aircraft and land based viewing operations using photo equipment * Near coastal gill net and seine salmon and herring fisheries using all sizes of vessels,

	aircraft and land based viewing operations using photo equipment * Near coastal shrimp and crab (Dungeness, king and tanner) pot fisheries using aircraft, medium and large vessels. * Off shore crab (king and tanner) fisheries using large vessels and infra-red equipped twin engine aircraft * Off shore ground fish (halibut, pacific cod etc.) longline and pot fisheries using larger vessels and infra-red equipped twin engine aircraft * Off shore trawl fisheries using large vessels and infra-red equipped twin engine aircraft * Southeast Alaska salmon troll fisheries using all sizes of vessels and aircraft * Herring pound fisheries using mostly medium sized vessels * Rock fish jigging fisheries using any vessel class * Dive fisheries (sea cucumber, sea urchin) fisheries ***Patrol Information*** * well over 1,100 days at sea scheduled per year for medium and larger vessels (does not include use of day skiffs) * Larger vessels travel throughout the state on extended patrols up to a month long * Medium sized vessels patrol up to a week at a time * Calendar year 2005 had nearly 400 commercial fishing violations charged resulting in over $750,000 in fines in addition to nets, pots and other equipment being forfeited * Vessels used in committing the most egregious offenses are sometimes seized and forfeited to the state * Patrols are often conducted in conjunction with NMFS and USCG ***Contacts & Citations*** Three year average for years 2007-2009 for all AWT fisheries patrols statewide (commercial, subsistence, sport fishing, personal use) – * contacts average 38,939/year * citations average 2,045/year * man hours average 151,081/year ***sources of evidence –*** * Capt. Steven Arlow, AWT * Capt. Steven Hall, AWT * Lt. Bernard Chastain, AWT * Capt. Michael Cerne, USCG * Special Agent-In-Charge Kevin Heck, NMFS, OLE

Clause:

12.2 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.

12.2.1 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.

FAO Main Criteria 8.2.7

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence
12.2	Alaska's salmon fisheries are managed by ADFG, pursuant to Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5). These laws and regulations are enforced by the Alaska Department of Public Safety, Alaska State Troopers, Division of Wildlife Troopers (AWT). AWT coordinates with, and is supported by, law enforcement personnel from USCG and NMFS. ***sources of evidence –*** Alaska Statutes Title 16 (laws) Alaska Administrative Code Title 5 (regulations) http://www.cf.adfg.state.ak.us/ http://www.dps.state.ak.us/awt/ http://www.nmfs.noaa.gov/ole/ http://www.uscg.mil/d17/
12.2.1	Sanctions for offenders in violation of fishing regulations include the possibility of temporary or permanent revocation of fishing privileges. Withdrawal or suspension of authorizations to officers of a fishing vessel are also among the enforcement options. Within the USA EEZ, penalties can range up through forfeiture of the catch to forfeiture of the vessel, including financial penalties and prison sentences. In addition, AWT has increased undercover fisheries operations for sport and commercial fisheries over last 3 years. A fully staffed investigations unit dedicates time to commercial investigations. The health and sustainability of Alaska's fisheries does not, in itself, prove that Alaska's regulatory enforcement is effective, but sustainability would be impossible without effective enforcement. In general, USCG's enforcement efforts focus on two types of "significant violations" -- those which would do harm to the resource, and those which would create an economic advantage to the violator. The incidence of, and trends in, these significant violations are monitored closely. Another measure is the "triple correlation" of regulatory compliance with observed violations with enforcement

	presence. The objective of regulatory enforcement is to ensure compliance. An essential element of this effort is the public perception of a high level of patrol and enforcement, which creates the view that "It doesn't pay to cheat". Finally, the cooperation of citizens and industry is cultivated through programs such as AWT's Fish & Wildlife Safeguard program, which encourages the reporting of violations, and "leverages" the range of enforcers. ***sources of evidence –*** * Capt. Steven Arlow, AWT * Capt. Steven Hall, AWT * Lt. Bernard Chastain, AWT * Capt. Michael Cerne, USCG * Special Agent-In-Charge Kevin Heck, NMFS, OLE

E. Serious Impacts of the Fishery on the Ecosystem

13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.

FAO 7.2.3/8.4.7/8.4.8/12.11
ECO 29.3/31

Confidence Ratings	Low	None	Medium	None	High	7 out of 7

Clause:

13.1 The impacts of environmental factors on target species and those species associated with, or dependent on the target stocks, shall be assessed.

FAO Main Criteria 7.2.3

13.1.1 The most probable adverse impacts shall be considered, taking into account available scientific information, and local knowledge.

13.1.2 Impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or further analysis of the identified risk.

FAO Main Criteria 29.3 Other 31

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence
13.1	Alaska's Sustainable Salmon Policy includes provisions addressing the potential effects of ecological changes/perturbations on sustainably allowable harvest: " salmon fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning " as follows: (A) salmon spawning escapements should be assessed both temporally and geographically; escapement monitoring programs should be appropriate to the scale, intensity, and importance of each salmon stock's use; (B) salmon escapement goals, whether sustainable escapement goals, biological escapement goals, optimal escapement goals, or inriver run goals, should be established in a manner consistent with sustained yield; unless otherwise directed, ADFG will manage Alaska's salmon fisheries, to the extent possible, for maximum sustained yield; (C) salmon escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the salmon stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the salmon stock measured; (D) salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of size range, sex ratio, and other population attributes;

	(E) impacts of fishing, including incidental mortality and other human-induced mortality, should be assessed and considered in harvest management decisions; (F) salmon escapement and harvest management decisions should be made in a manner that protects non-target salmon stocks or species; (G) the role of salmon in ecosystem functioning should be evaluated and considered in harvest management decisions and setting of salmon escapement goals; (H) salmon abundance trends should be monitored and considered in harvest management decisions (5 AAC 39.222, State of Alaska Regulation).
13.1.1	**The most probable adverse impacts shall be considered, taking into account available scientific information, and local knowledge.** As noted above potential ecological effects on salmon stocks are incorporated in the establishment of escapement goals for each stock. The allowable harvest in each year is set with respect to the goal. If a stock chronically fails to realize escapement goals it is reported by ADFG to the BoF as a stock of concern (either 'conservation', ',management' or 'yield stock of concern') and the management plan is amended to protect the productivity of the stock; an action plan is associated with the management plan: "(4) in association with the appropriate management plan, ADFG and the BoF 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 … (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; (5 AAC 39.222. (State of Alaska Regulation; emphases added) An example of the ongoing review of escapement goals is in ADFG Fishery Manuscript 08-02 in which goals for Prince William Sound, Copper River and Bering River are reviewed. An example of ADFG reports to the BoF on Stocks of Concern is in Division Director Hilsinger's memorandum dated Sept 22, 2009. The memorandum summarized the results of the stock of concern evaluation for the Arctic-Yukon-Kuskokwim Region salmon stocks for the 2010 BoF regulatory cycle. In September 2000, the BoF designated nine AYK Region salmon stocks as stocks of concern, at either the management concern level or the yield concern level. In January 2004 and February 2007, the BoF made changes to the stocks of concern designations based on recommendations by the ADFG. In 2004, two stocks were removed and one stock was added (a total of eight stocks designated). In 2007 four stocks were removed from designation. Currently only two chum salmon stocks and two Chinook salmon stocks are listed as stocks of yield concern. Based on the evaluation, it was

	recommended that the four salmon stocks designated in 2007 as stocks of yield concern maintained their designations. The evaluation also included a review of all other major salmon stocks in the region to determine if any met the criteria to be listed as stocks of concern during the upcoming regulatory cycle. Based on this no additional stocks were to be listed for designation as stocks of concern http://www.boards.adfg.state.ak.us/fishinfo/meetinfo/2009-2010/Worksession/ayk-soc-9-28-09.pdf.
13.1.2	**Refer to the information in 13.1.1.**

Clause:

13.2 Assessments/ scientific evaluation shall be carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations.

13.2.1 The effect of such gear introduction shall be monitored.

FAO Main Criteria 8.4.7 Other 12.11

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
13.2	Introduction of new gear or methods or operations into Alaska salmon fisheries is rare or absent. State law and regulation specify gear and its size (i.e. legal gear in commercial fisheries includes only gillnet, seine, troll for which maximum sizes are specified). Under these restrictions gear and methods and operations have become marginally more technologically and operationally efficient year by year but these changes, because harvest rates are controlled within biological limitations, are not considered to have 'habitat disturbance impact on the fisheries and ecosystems.'
13.2.1	**See above**

Clause:

13.3 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.

FAO Main Criteria 8.4.8

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
13.3	While there is a rich and growing literature in Alaska on the environmental and social impacts of salmon fisheries, that literature is not particularly focused on impacts of salmon fishing gear. The seminal issue in Alaska statehood, a half century ago, was whether the impacts of fixed traps on biodiversity and coastal fishing communities were tolerable; the clear political decision of the time was that they were not to be tolerated (among the very first acts passed by the Alaska Legislature was one outlawing salmon traps).

14. Where fisheries enhancement is utilized, environmental assessment and monitoring must consider genetic diversity and ecosystem integrity. ***FAO 9.1.2/9.1.3/9.1.4/9.1.5/9.3.1/9.3.5***						
Confidence Ratings	**Low**	**None**	**Medium**	**None**	**High**	**3 out of 3**

Clause:

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

FAO Main Criteria 9.1.2

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
14.1	**1) Finfish farming prohibited.** Closed-cycle (Intensive) salmon aquaculture is not permitted in Alaska. Alaska does not promote development and management of any such salmon aquaculture (Alaska Statues 16.40.210 Finfish farming prohibited). **2) The practice of salmon ocean ranching for fishery enhancement.** Extensive, ocean ranching, salmon aquaculture for fishery enhancement is practiced widely in Alaska—see evidence for clause 14.3. Responsible aquatic farming of shellfish and aquatic plants is promoted and regulated by Alaska (Alaska Statutes 16.40.100 – 199 – Aquatic Farming and Alaska Statutes 38.05.083 Aquatic farming and hatchery site leases) and enforced in regulations (5 AAC 40.005-990 Private Nonprofit Salmon Hatcheries, 5AAC 41.001-599 Transportation, Possession and Release of Live Fish; Aquatic Farming, and 11AAC Part 6 Lands Chapter 63 Aquatic Farmsite Permits and Leases). See also http://www.cf.adfg.state.ak.us/geninfo/enhance/maricult/maricult.php and http://dnr.alaska.gov/mlw/aquatic/index.htm). **3) Aquatic farming of shellfish & plants is practiced.** In 2009 25 farms (out of 67 permitted farms) produced oysters, clams, mussels, scallops, seaweed, and sea cucumbers worth $473 thousand (See http://www.cf.adfg.state.ak.us/geninfo/enhance/maricult/aqfarm_i/90-09farm.php). Establishing an aquatic farm requires permission of the Alaska Department of Natural Resources (ADNR), Division of Mining, Land & Water which requires that a proposed farm is consistent with the Alaska Coastal Management Program standards and policies administered by ADNR. (Alaska Statutes 38.05.083 Aquatic farming and hatchery site leases; Alaska Administrative Code Title 11 Natural Resources Part 6 Lands Chapter 63 Aquatic Farmsite Permits and Leases; Also see: http://dnr.alaska.gov/mlw/aquatic/index.htm). A Site Lease from ADNR is issued only after ADFG has reviewed and approved the proposed farm. ADFG issues the operating permit only after a Lease is issued. The Alaska Department of Environmental Conservation (ADEC) regulates seafood safety and

	classifies waters for aquatic farms; ADEC requires an annual growing area classification (with regard to contaminants that may be present), a harvest permit, and issues a shellfish shipper permit to operating farms http://www.dec.state.ak.us/eh/fss/seafood/shellfish.htm. ADFG Commercial Fisheries Division and ADNR Mining Land & Water Division each have a full time staff to support the program. Permits are required to lease a site and to operate a farm or hatchery. Operators are required to report and control disease and the conditions under which wild stocks of aquatic plants and shellfish can be used or displaced are regulated to prevent introduction of pathogens. Transport of seed is regulated so as to prevent introduction of exotic and potentially invasive organisms**.**

Clause:	
14.2	**States 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.** ***FAO Main Criteria 9.1.3 Other 9.1.4***
Evidence adequacy rating:	**☑High ☐ Medium ☐ Low**
Clause:	**Evidence**
14.2	Alaska development strategies and plans for mariculture of aquatic plants and shellfish are incorporated in laws relating to aquaculture (Alaska Statutes 16.40.100 – 199 – Aquatic Farming and Alaska Statutes 38.05.083 Aquatic farming and hatchery site leases) and enforced in regulations (5 AAC 40.005-990 Private Nonprofit Salmon Hatcheries, 5AAC 41.001-599 Transportation, Possession and Release of Live Fish; Aquatic Farming, and 11AAC Part 6 Lands Chapter 63 Aquatic Farmsite Permits and Leases). See also http://www.cf.adfg.state.ak.us/geninfo/enhance/maricult/maricult.php; http://dnr.alaska.gov/mlw/aquatic/index.htm. Ecological sustainability is an objective of the ADFG Operating Permit required of farm operators. They are required to report and control disease. The conditions under which wild stocks of aquatic plants and shellfish can be used or displaced are regulated to prevent introduction of pathogens. Transport of seed is regulated so as to prevent introduction of exotic and potentially invasive organisms. Rational use of shared resources is an objective of the periodically reviewed Site License issued by the Alaska Department of Natural Resources (ADNR), Division of Mining, Land & Water. They require that a proposed farm is consistent with the Alaska Coastal Management Program standards and policies administered by ADNR. A Site Lease from ADNR is issued only after ADFG has reviewed and approved the proposed farm. ADFG issues the operating permit only after a Lease is issued. Further, the Alaska Department of Environmental Conservation (ADEC) regulates seafood safety and classifies waters for aquatic farms; ADEC requires a growing area classification (with regard to toxins that may be present) and a harvest permit, and issues a shellfish shipper permit to operating farms.

Clause:

14.3 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 and related economic and social consequences.

FAO Main Criteria 9.1.5

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
14.3	Extensive ocean-ranching salmon aquaculture is practiced by non-profit private sector corporations (PNP) for the purpose of enhancing CPF (AAC 5 Chapter 40 Private Nonprofit Salmon Hatcheries; Alaska Statutes 16.10.400. Permits for salmon hatcheries). The 31 PNP hatcheries annually take 1.8B eggs, release 1.5B juveniles, and provide 45M adult salmon to the harvest; (Alaska Salmon Enhancement Program 2009 Annual Report, Fishery Management Report no. 10-05). They contribute annually to the CPF salmon valued at over $20M at first sale in Prince William Sound (Economic Impact of the Prince William Sound Aquaculture Corporation) and fish valued at over $15M in Southeast Alaska (Economic Impacts of Private Nonprofit Aquaculture Associations in Southeast Alaska); their annual statewide economic output exceeds $300M. They are regarded as economically essential by the Alaska industry (Trident Letter to Alaska Governor Parnell). Several other small hatcheries operated by public agencies or schools serve research, education, or lake-and-pond sport fisheries. The activities of those corporations, i.e. their salmon hatcheries and the harvest of the salmon they produce, are regulated so as to avoid or minimize effects on genetic diversity of wild salmon and on ecosystem integrity by the state through ADFG including 1) the location of hatcheries with respect to wild salmon stocks, and with respect to fisheries on those stocks so as to present minimal risk of overharvest to wild stocks in mixture fisheries, 2) the propagation of locally adapted stocks so as to present minimal risk of genetic damage to wild stocks (5 AAC 40.170. Regional planning team review); see also Genetic Policy in references). As a result of these regulations and procedures all of the large 'production scale' hatcheries are at tidewater, not high in river basins, and are distant from significant wild stocks where risks to wild stocks, i.e. from straying or mixed harvest, are minimized. Further evidence of the efficacy of the regulation is that requests for permit alterations by hatchery corporations that would increase hatchery releases have been recently denied under these considerations (See Permit Alteration Request Denial, Commissioner of Fish & Game letter to Prince William Sound Aquaculture Corporation, dated Sept 9, 2010). This demonstrates that economic arguments in deciding the capacity of hatcheries do not necessarily prevail over ecological concerns. Locations and sizes of hatcheries are first of all considered by Regional Planning Teams comprised of ADFG biologists and officials and of members of the regional fishery enhancement corporations, i.e. members of the fisheries and communities in the region in question (5 AAC 40.300. Regional planning teams in general). These Teams and the Plans for which they are responsible are charged with considering effects of proposed hatcheries on the productivity of wild salmon stocks (i.e. genetic fitness of wild salmon stocks) as well as economic and social effects of hatcheries. Permits for fishery enhancement hatcheries and operations of the hatcheries are both

regulated by ADFG (Chapter 40 Private Nonprofit Salmon Hatcheries ; Article 4 Permit Application Procedures ; 5 AAC 40.820. Basic management plans; 5 AAC 40.830. Hatchery inspection ; 5 AAC 40.840. Annual management plans ;. 5 AAC 40.860. Performance review . Criteria required in permits and operating plans relate to:

1) fish pathogens and health (ADFG maintains a fish disease laboratory system responsible for both diagnostic services and regulation responsibilities),

2) gene conservation (ADFG maintains a gene conservation laboratory responsible both for genomic analysis of Alaska stocks and regulation of hatchery activities,

3) harvest management (the management biologists of the local area and region are consulted in consideration of the effect through harvest of the hatchery-produced salmon on the productivity of wild salmon).

These permitting requirements and operational requirements have been successful in preventing known introduction of any exotic, novel, fish pathogen into Alaskan stocks. They have been successful in preventing propagation of stocks of salmon not endemic to the region in which they are released. There are no 'stocks of concern' (as prescribed by the Alaska Policy for the Management of Sustainable Salmon Fisheries, 5 AAC 39.222) brought to that state by the activities of hatcheries.

Major advances have been made over the 35 yr history of the Alaska salmon fishery enhancement program, particularly the practice since the early 1990s of applying a discriminating mark to the substantial majority of the hundreds of millions of juvenile salmon released each year, i.e. the otolith thermal marking program (follow link to http://tagtoweb.adfg.state.ak.us/OTO/). This marking program, undertaken at the initiative of the PNP hatcheries, augments the earlier program of applying coded wire tags to a sample of each stock (http://tagotoweb.adfg.state.ak.us/CWT/). In a mixed-stock fishery marks can be detected in a representative sample of the catch virtually in real-time, enabling the harvest manager to regulate harvests so as to protect the productivity of wild stocks.

Problems are also being revealed by this technology—in both Southeast and Prince William Sound, for instance, recent analyses of salmon on the spawning grounds is revealing that in some streams a substantial portion of the spawning population has strayed from one or another of the hatcheries and that the assessment of the wild-stock spawning population may be thereby biased. Evidence of this stock assessment problem has been recently reported as "Hatchery pink and chum salmon straying into Prince William Sound and southeast Alaska streams" presented by R. Brenner, A. Piston, S. Moffitt, S. Heinl to the State of the Salmon 2010 Conference, Ecological Interactions Between Wild and Hatchery Salmon, May 7 – 10, Portland, Oregon (Abstract page 22 of Program, http://www.stateofthesalmon.org/conference2010/downloads/SoS_2010_Program.pdf).

Evidence is also given in DM Eggers and SC Heinl, Chum Salmon Stock Status and Escapement Goals in Southeast Alaska, ADFG Special Publication 08-19, 2008. Ongoing research sponsored by ADFG and the PNP sector is evaluating the extent of the problem. Alaska Sustainable Salmon Fund projects 45473 and 45863 are being carried out by ADFG Commercial Fisheries Division, studying straying by hatchery salmon in Prince William Sound. Alaska Sustainable Salmon Fund project 45957 is being carried out by the University of Alaska and ADFG studying effects of gene introgression from hatchery-produced salmon on wild stocks of salmon.

Another ecological problem that is being revealed by this mass-marking technology (and by the rapidly advancing science of genomics) is that of density-dependent growth of wild stocks of

	salmon in the North Pacific Ocean and its marginal seas when hatchery-produced salmon are present, particularly pink salmon and chum salmon (the latter largely produced by hatcheries in Asia.) (Evidence of actual ecological density dependence in stock dynamics, ie. density dependent survival, is less compelling.) A recent widely read and remarked paper on the problem is Ruggerone *et al.*, 2010. Mar Coast Fish Dynam Manag Ecosyst Sci 2:306-308. Both national and international research programs have been and are studying this issue. The NPAFC (established by international convention for the conservation of salmon in the early 1990s) conducts the High Seas Salmon Research Program (http://www.fish.washington.edu/research/highseas/research.html) in which it plans and coordinates research by scientists from member nations on the broad topics 1) status and trends of stocks and of the structure and diversity of stocks and 2) effects of climate change on salmon stocks. The Ruggerone *et al.* paper is a recent example of their accomplishment. NOAA at its Fisheries laboratory at Auke Bay, Alaska, in addition to cooperating in NPAFC's high seas research program, conducts a program of Marine Ecology of Juvenile Salmon (See: http://www.afsc.noaa.gov/ABL/MSI/msi_me.php) in which they cooperate with the University of Alaska and with ADFG. This research is based on long term sampling and process-oriented study of both hatchery and wild juvenile salmon in the coastal ocean where survival of salmon cohorts is determined. These time-series and process-oriented studies have revealed no compelling evidence of ecological interaction of Hatchery and Wild salmon in the coastal marine habitat. (Results and publications reviewed in 'Insights From a 12-Year Biophysical Time Series of Juvenile Pacific Salmon in Southeast Alaska Coastal Monitoring Progect (SECM)" a Research Feature article in the July-Aug-Sept 2009 Quarterly Report of the Alaska Fishery Science Center (http://www.afsc.noaa.gov/Quarterly/jas2009/JAS09feature.pdf).

8. External Peer Review

Peer Reviewer A upon Peer Review of the document:

"*The assessors did a completely comprehensive job on validating high ratings for evidence on the verification of FAO-Based Responsible Fisheries Management Certification Program (Alaska). I found their output to be comprehensive, convincing, and concise. I suggest some extremely minor clarifications indicated in red, in the document I have submitted. If the suggestions are ignored, it in no way diminishes the conclusions, or my agreement with those conclusions. While the 70K word length may be cumbersome to the lay reader, it moves very smoothly for anyone familiar with Alaska's salmon fisheries, or with a basic understanding of any well-developed commercial fishery. Natural cycles come and go, but after more than 130 years of commercial removals under the supervision of the Bureau of Commercial Fisheries and then the Alaska Department of Fish and Game, this renewable resource remains viable, healthy, and provides a remarkable source of economic income for Alaska and the fishermen who participate in the fishery".*

SECTION	
A	**Fisheries Management System**
1. There must be a structured and legally mandated management system based upon and respecting International, National and local fishery laws and considering other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment.	
No comment was deemed necessary by the reviewer.	
2. Management organizations must participate in coastal area management related institutional frameworks, 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 the avoidance of conflict among users.	
No comment was deemed necessary by the reviewer.	
3. Management objectives must be implemented through management rules and actions formulated in a plan or other framework.	
No comment was deemed necessary by the reviewer.	
B	**Science and Stock Assessment Activities**
4. There must be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes.	
No comment was deemed necessary by the reviewer.	

5. There must be regular stock assessment activities appropriate for the fishery resource, its range, the species biology and the ecosystem and undertaken in accordance with acknowledged scientific standards to support optimum utilization of fishery resources.	
No comment was deemed necessary by the reviewer.	
C	**The Precautionary Approach**
6. The current state of the stock must be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and target. Remedial actions must be available and taken where reference point or other suitable proxies are approached or exceeded.	
No comment was deemed necessary by the reviewer.	
7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient, a suitable method using risk assessment must be adopted to take into account uncertainty.	
No comment was deemed necessary by the reviewer.	
D	**Management Measures**
8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery, and based upon verifiable evidence and advice from available scientific and objective, traditional sources.	
No comment was deemed necessary by the reviewer.	
9. There must be defined management measures, designed to maintain stocks at levels capable of producing maximum sustainable levels.	
No comment was deemed necessary by the reviewer.	
10. Fishing operations must be carried out by fishers with appropriate standards of competence in accordance with international standards and guidelines and regulations.	
No comment was deemed necessary by the reviewer.	

E	**Implementation, Monitoring and Control**
11. An effective legal and administrative framework must be established and compliance ensured, through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction.	
No comment was deemed necessary by the reviewer.	
12. There must be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.	
No comment was deemed necessary by the reviewer.	
F	**Serious Impacts of the Fishery on the Ecosystem**
13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.	
No comment was deemed necessary by the reviewer.	
14. Where fisheries enhancement is utilized, environmental assessment and monitoring must consider genetic diversity and ecosystem integrity.	
No comment was deemed necessary by the reviewer.	

Peer Reviewer B comments on the Assessment Report:

SECTION	
A	**Fisheries Management System**
1. There must be a structured and legally mandated management system based upon and respecting International, National and local fishery laws and considering other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment.	
Section A, 1, the legally mandated Fisheries Management System was described fully and accurately. The Alaska management system has a very strong legal mandate from the Alaska State Constitution down through regulations promulgated through the Board of Fisheries. There are international treaties that have been negotiated and there are mechanisms in place to track the outcomes of	

those negotiated treaties. The Alaska system of having an escapement goal in regulation instead of a harvest goal insures the conservation of the fishery and resource as a whole. I concur with the ratings for this section.

2. Management organizations must participate in coastal area management related institutional frameworks, 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 the avoidance of conflict among users.

Section A. 2, was also fully described showing how the management system incorporates the agencies involved in the coastal area management. There was sufficient detail that all aspects of how that habitat through which salmon pass is protected. This section was accurate and described fully the extent to which the public is involved in the management system through the Board of Fisheries. I concur with this section.

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

Section A, 3, was complete and accurate describing how management rules are developed and utilized in the management of the fisheries. The limited entry system made the management of the commercial salmon fishery in Alaska sustainable through a controlled harvest system. The regulations adopted by the Board of Fisheries are thoroughly vetted in a public process so that the users have the opportunity to participate and understand how and why decisions are made. This section was very complete and accurate. I concur with the ratings for this section.

B	**Science and Stock Assessment Activities**

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

Alaska has developed an effective stock assessment system. I found this section very accurate and was one of the most compelling sections for the highest ratings. Stock assessment has been ongoing since statehood and is an expected part of most if not all of the fishery management plans adopted by the BoF. I concur with the ratings for this section.

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

Alaska has a very diverse coast line and a variety of stocks of all five species of salmon entering systems at different times during the spring and summer. The efforts put into the stock assessment activities describe a very useful system for salmon management. The standards used are defensible and provide managers with valuable information in regulating the fishery. This section might have been strengthened by a short discussion of the “windows” passage of salmon up the Yukon river to meet treaty obligations for those stocks of fish. I still concur with the ratings for this section.

Assessment Team Response:
Windows fishing relates only to subsistence fishing, not to commercial or sport fishing, and it relates mostly to Chinook salmon. The idea is to spread the harvest throughout the river, mostly in the US portion of the river, to be consistent with the natural timing of the runs.

Although Yukon River Chinook salmon are sometimes referred to as a stock or a run, there are actually a great many runs to the myriad Yukon tributaries. About half of Yukon kings spawn in Alaska, and half in Canada. Fish which are headed furthest upstream (to eastern Alaska and to Canada) are first to enter the river from the ocean.

In the USA, most subsistence fishing effort is concentrated in the lower ½ to ¾ of the river. It is a general tendency for subsistence fishermen to try to catch as much as possible as soon as possible. Reasons vary along the river, but include issues such as the desire to catch fish before the rainy season starts, so that the products can be properly air-dried, and considerations of seasonal changes in water levels in certain fishing areas.

As part of its treaty obligations, the USA (represented by ADFG) closes (prohibits) subsistence fishing for certain periods. These closures can range from 2 days in length in the lower river, to very short closures in the Yukon near the Canadian border.

These are the "windows" through which Chinook salmon escape capture in the lower river, and make it upstream far enough to spawn and/or get caught in their natural places and tributaries. This benefits both upriver stocks and upriver fishermen, in both the USA (eastern Alaska) and Canada.

C	**The Precautionary Approach**

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

This section was adequately described. Alaska does use the precautionary approach to salmon management when there is inadequate information. The in season managers have real time authority to open or close fisheries in order to meet escapement goals. This ability allows for precaution for unknown conditions. The flexibility to react quickly allows for precaution rather than waiting until damage occurs. I concur with the ratings for this section.

7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient, a suitable method using risk assessment must be adopted to take into account uncertainty.

The section was also very accurate. The Sustainable Salmon Policy outlines the escapement goals for exploited salmon must be set. If the Department of Fish and Game determines that a stock is of a concern following the guidelines that have been established in policy that concern is brought to the Board of fisheries along with a plan for recovery of that stock for approval and implement the plan. I concur with the ratings for this section.

D	**Management Measures**

8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery, and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

This section explains very thoroughly how the management system in Alaska functions. The Sustainable Salmon Policy in state regulation requires that managers ensure sustainable yield.

The ultimate goal is establishing a BEG for a salmon stock. As mentioned a considerable amount of information is need to meet the requirements for a BEG. Since that type of information takes years to establish and at considerable expense a more realistic SEG is used in most cases. The policies established to provide for escapement will strive for the SEG or on occasion an OEG. In all cases these goals all provide for precaution as mention earlier. This is one area that I agree with the ratings although I do believe too much emphasis is being placed on BEGs when most of the stocks are not managed for that exactitude. All stocks are managed for sustainability which meets the performance measure at a high level. All other aspects of this measure are fully explained and are accurate. I concur with the high rating of this section.

Assessment Team Response: The Assessment Team concurs with the Peer Reviewer response with respect to the use of SEGs where there is insufficient information to allow a BEG to be set. The Assessment Team also notes that an SEG is set under the same transparent process as BEG regardless of this. SEGs are set with a precautionary approach in this regard and the Assessment Team felt that this demonstrates consistency with the sustained yield principle. In addition, the Assessment Team has documented the differences (definitions) in BEG and SEG to highlight the different circumstances that these are used.

9. There must be defined management measures, designed to maintain stocks at levels capable of producing maximum sustainable levels.

The limited entry system has allowed the state of Alaska to control the harvest of this resource at a level that is based on science and sustained yield. The limited entry system brings the commercial fishing effort to a level that the participants can have an orderly fishery without jeopardizing the sustainability of the resource. The sustainability policy also requires that a recovery plan be implemented on any stock that is of concern of maintaining a sustainable yield. I question whether maximum sustained yield is the proper term. SG: But I wish that s/he would have then suggested a better alternative term. Again, to reach a maximum sustained yield a considerable amount of information is needed in all aspects of the stock life history and very precise management tools need to be in place to control harvest and escapement. There are few places that this might be achieved, one such place might be in the ocean ranching hatchery system where many of the conditions are controlled, the escapement can be measure precisely, and all surplus salmon harvested.

Assessment Team Response: An SEG should be set above a proxy for SSBmsy - allowing for a precautionary spawning escapement set at a level that supports sustained yield over 5-10 years Some small degree of over-escapement can occur occasionally.

State subsistence regulations were only marginally discussed. The emphasis was placed on the federals subsistence program that requires a rural residency. However, any Alaska resident can still participate in a subsistence fishery once they leave a non subsistence area. Therefore, 10's of thousands of salmon can be harvested from urban dwellers under the state subsistence harvest guidelines. This was not made clear in the narrative. It sounds good to have the natives and rural residents being able to harvest these fish for subsistence, but in reality the state is not the agency that provides the rural priority, it is the federal government because the state constitution prohibits a rural priority. These fine points were not discussed. I concur with the high rating regardless of who provides for subsistence, but it was not defined well in this document.

Assessment Team Response: The Assessment Team concurs with the Peer Review comments in so far as that the State is not the agency that provides for rural priority. The assessment has focused upon commercial fisheries, primarily. Subsistence and sports has been included in part to demonstrate that they are managed consistently and fishing mortality is accounted for within the management process.

The wanton waste law does allow the commissioner some ability to provide for salmon disposal in certain situations. A reference was made to hatcheries in Prince William Sound being able to roe strip and dispose of the carcass because ADFG did not want the fish to stray. That occurred once and the Department of Fish and Game has since abandoned that practice. It took several years for industry to catch up and develop methods to harvest the dark surplus hatchery salmon to salvage the roe and then turn the carcass into a usable product such as meal. In the meantime the department let the hatchery fish stray. The value of the product forced industry to adapt which ultimately was a good thing and the present system is efficient in removing surplus hatchery salmon. There could have been a better transition. I concur with the high ratings for this section although some further explanation is some areas would be more transparent.

Assessment Team Response: The statement "In the meantime the department let the hatchery fish stray." is inadequate. Salmon runs cannot be switched on and off, their cycles take years to complete. So ADFG was not somehow lax or negligent in allowing straying to continue while solutions were developed. Also note that the roe stripping occurred only once, and then great attention was brought to bear on the issue, from ADFG, PWSAC, and industry, so that "the present system is efficient", as the reviewer says.

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

This section is well documented and explained the number of available trainings and required trainings. The list is impressive. Most fishermen now have the ability to properly care for their catch to insure it is of the highest standard. The opportunities for training to become better and safer at their chosen profession are readily available. It might have been possible in this section to identify some of the past practices that have been discarded in favour of more educated and product friendly technology. For example, refrigeration is common place on many vessels today, whereas 25 years ago that was the exception. Nearly all small gillnet vessels carry ice today, which in the past was the exception. Pews were outlawed so now the fish are handled by hand or pump so that the skin is never broken. These items would reinforce some of the subcategories. I concur with the high rating in this section.

Assessment Team Response: The Assessment Team concurs with the Peer Review comments. The focus of the assessment has been more on the responsible management of the fishery to the point of harvesting. The Assessment Team acknowledges that significant advancement in handling practices has occurred over the last 25 years. In addition to improved handling and preservation, there is a more efficient process for moving harvested fish to processors through a network of tender vessels that supply fish from catchers to the processors on a frequent and controlled basis. This supports improved freshness, reduces waste and preserves quality and prices.

E	Implementation, Monitoring and Control

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

There is a well established compliance system in the Alaska fisheries system as evidenced by the number of agencies involved to monitor and enforce regulations. The limited entry system is another method of control and is enforced by registration numbers and penalties for both the seller and the buyer if in violation. All the fisheries have control measures in place including the sport fishing industry. This area could have been strengthened even further, by incorporating the federal law enforcement of the US Forest Service and USF&WS and possibly the US Park Service in the inland sport fisheries. I concur with the high ratings in this section.

Assessment Team Response: The commercial salmon fisheries were the first consideration as this was part of the unit of certification. However, the Assessment Team concurs with Peer Review comments. All salmon harvests are monitored and regulated by ADFG & AWT, mostly directly, and a few with support from other agencies. Page 182 makes reference to the interaction between the AWT and US Forest Service and USF&WS in this regard.

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

This section establishes the framework for sanctions for violations. Loss of catch, loss of gear and fines are a large deterrent to illegal activities. Again, I think it could have been strengthened even more by including the federal law enforcement officers such as those with the USFS, USFWS, and US Park Service that patrol the inland waters. I concur with the high rankings in this section

Assessment Team Response: Same as above.

F	Serious Impacts of the Fishery on the Ecosystem

13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.

The use of in season management to obtain escapement goals considers all of the serious impacts of the fishery on the ecosystem. In many sockeye salmon systems where weirs are utilized the escapement goal is precisely known and checked against run curve timing. The fishery is regulated by that escapement goal. That goal also considers the need of the lake system not only for spawning, but in some systems the need for other parts of the ecosystem such as bear predation and lake fertilization. Over escapement has been controlled on occasion in some systems by stopping fish at the weir if the fishery was not able to harvest all of the surplus salmon.

Open fishing period are staggered throughout the season so that portions of the run are able to

reach the spawning grounds rather than only the last fish or the first fish to show up. Some of these items may have added some strength to this section, but even as written I concur with the high ratings.

Assessment Team Response: The Assessment Team concurs with the Peer Reviewer comment and is aware of the distribution of fishing effort throughout the season to allow a wide range of salmon individuals to reach spawning grounds. Management plans create fishing opportunities based on seasonal run patterns allowing for escapement throughout the season and enabling a wide range of individuals to reach the spawning grounds. In addition, the in-season management system is mentioned in several points over the text (i.e. page 110, 136), which allows/stops/resumes fishing as the salmon runs climb back to their natal streams.

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

This section needs to separate ocean ranching and aquatic farming into separate areas for the reader not to be confused about the two separate industries. Using the term Aquatic farming and hatchery site in the same sentence because it is state regulation tends to blur the boundaries potentially confusing the reader even though it is stated clearly at the beginning that salmon farming is not legal in the state of Alaska.

In all fairness, the sponsoring of much of the straying studies has been from the salmon hatchery operators. The hatchery industry is also interested in learning if and to what extent the straying maybe affecting wild stock escapement. The reader is left with the impression that the industry is doing nothing which is not the case. This section could have been strengthened by adding the cooperative aspects of acquiring more information that can benefit management. PWSAC for example, over the years has invested several hundred thousand dollars in straying studies. Overall, I concur with the high ratings in this section.

Assessment Team Response: The Assessment Team would like to concur that hatcheries have contributed substantially to the understanding of the interaction of strays with wild runs and would like to state that the industry continues to contribute to the acquisition of knowledge through research programs. The Assessment Team would like to refer interested readers to Section 7, F, clause 14.3, page 200.

9. Non-conformances and Corrective Actions

Non conformances are categorized as minor, major and critical non conformances. Where the Assessment Team concludes that the available evidence does not meet the 'high' confidence rating for a specific clause of the Conformance Criteria, and on further clarification with fishery management organizations, the outcome remains unchanged; a non conformance is raised against that particular clause.

Throughout the assessment, clarifications have been sought through on site consultation and additional contact (e-mails and phone calls) with various organizations that form the management system for Alaska salmon. Through this process, the collective decisions of the Assessment Team have resulted in high confidence ratings assigned to each of the Conformance Criteria.

As such, no non conformances have been raised against the US Alaska salmon fisheries during assessment to the FAO-Based RFM Certification Program.

10. Conclusions and Recommendations

The US Alaska salmon fisheries has a structured and legally mandated management system based upon and respecting International, National and local fishery laws. It considers other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment. The principal management organization for Alaska salmon, ADFG, participates in coastal area management related institutional frameworks, decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources, avoiding conflicts among users, where possible. ADFG, towards effective management of Alaska salmon, collects effective fishery data (dependent and independent) and has analysis systems for stock management purposes.

The fisheries achieved a high rating confidence against the clauses of the FAO Conformance Criteria and no non conformances were raised. Throughout the assessment a number of requests for clarification were made to the ADFG which were addressed. These were in the whole related to requests for further information rather than concerns of conformity of the management system.

In conclusion, stock assessment activities are appropriate and regular for the fishery resource, its range, the species biology and the ecosystem. Stock assessment activities are undertaken in accordance with acknowledged scientific standards to support optimum utilization of fishery resources. The current state of the stock is managed towards "sustainable escapement goals" through BEGs, SEGs, OEGs and SETs reference points/ranges for effective management objectives.

Remedial actions such as Emergency Orders are enacted when salmon stocks approach yield, management or conservation concern. Management actions and measures for the conservation of stock and the aquatic environment are based on the Precautionary Approach. Where information is deficient, in respect of the precautionary approach, aggregate stock escapement goals are set,

managed and enforced. Harvest control rules and technical measures are applied towards the management and conservation of Alaska salmon.

There are defined management measures, designed to maintain stocks at levels capable of producing maximum sustainable levels, and fishing operations are carried out by fishers with appropriate standards of competence in accordance with international standards, guidelines and regulations. Effective mechanisms for monitoring, surveillance, control and enforcement of all fishing activities within Alaska jurisdiction are active and effective in managing sustainably salmon stocks.

Monitoring, surveillance and control activities are performed based on an established framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.

Considerations of fishery interactions and effects on the ecosystem are currently based on best available science and are appropriately assessed and effectively addressed. Since ocean ranching has a significant input on total common property salmon fisheries harvest in Alaska, the genetic diversity of wild salmon stocks and ecosystem integrity has been increasingly considered, assessed and monitored by several state (including ADFG) and federal agencies involved in pacific salmon management and conservation.

The Assessment Team of this salmon Assessment Report recommend that the management system of the applicant fishery, US Alaska salmon (all species and gear types), fished by the commercial fishery under the state management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

Determination:

The appointed members of the Global Trust Certification Committee met on the 11th of March 2011. After detailed discussion, the Committee determined that the applicant fishery, US Alaska salmon (all species and gear types) fished by the commercial fishery under the state management of the Alaska Department of Fish and Game is awarded certification to the FAO-Based Responsible Fisheries Management Certification Program.

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Appendix 1

Alaska Salmon Assessors.

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd. confirmed the Assessment Team members for this fishery as follows.

Stephen Grabacki (Assessor)

Stephen Grabacki, FP-C, holds a Master of Science degree in Fisheries Biology from University of Alaska Fairbanks. He is a Certified Fisheries Professional, in the American Fisheries Society. Steve has 32 years of experience in Alaska's fisheries as a consultant providing technical services in fisheries biology, fishery management, and seafood quality. As Adjunct Professor at University of Alaska Anchorage, Steve has taught courses in Fisheries Management and Seafood Logistics. He serves on the Board of Directors of the Alaska SeaLife Center, and is a member of the Export Council of Alaska.

Dr. William Smoker (Assessor)

Bill Smoker is an Alaskan salmon biologist. His research is on local adaptation of salmon and on genetic and environmental interactions of hatchery and wild salmon; he's author or co author of more than 50 peer-reviewed scientific papers on salmon biology. He retired in '09 from University of Alaska Fairbanks where he was Director of Fisheries and now holds the rank of Emeritus Professor.

He's a reviewer for the NW Power and Conservation Council in Portland and formerly a founding member of the Hatchery Scientific Review Group in Washington. He earned his BA (Biology) at Carleton College, and his MS (Oceanography) and PhD (Fisheries) at Oregon State University.

Rolland Holmes (Assessor)

After receiving a master's degree from the University of Alaska in Fisheries Management, Rocky Holmes spent his entire career with the Alaska Department of Fish and Game. He began his career as a research biologist working on Arctic grayling population dynamics and management and continued as the Research Coordinator for the Arctic-Yukon-Kuskokwim Region of the Division of Sport Fish. After the Exxon Valdez Oil Spill in 1989, Mr. Holmes worked as the fishery program manager for the Oil Spill Division, before moving back to the Division of Sport Fish as the Deputy Director and later as the Regional Supervisor for the Southeast Region. Mr. Holmes' career provided him with a broad background in research and management issues, especially related to salmon in Southeast Alaska.

Steven McGee (Assessor)

Steve McGee received a B.Sc. in biological sciences from the University of Alaska in 1975 and an M.Sc. in parasitological from the University of Saskatchewan in 1978. He worked as a marine research assistant for the Institute of Marine Science in Fairbanks Alaska from 1979 to 1982, after which he went to work for the Alaska Department of Fish and Game FRED Division as a fishery biologist. Mr. McGee then spent 22 years with ADFG as the fishery biologist responsible for the private non-profit hatchery program. He supervised eight employees and managed a budget of approximately $0.5 million annually. Major duties included review of all new hatchery permit applications and hatchery management plans, collection and analysis of hatchery production data, and supervision of the state's mariculture program. From 2004 to 2006, Mr. McGee served as an invasive species biologist in the ADFG invasive species program investigating invasive species infestations and analyzing large vessel arrivals and ballast water discharge in Alaska as a possible mechanism for introducing invasive species to Alaska.

Deirdre Hoare (Assessor)

Deirdre has a BSc. and MSc. in Marine Zoology. She has worked in fisheries stock assessment as an observer on international projects in NAFO and Ireland. For the last 5 years she worked as a Fisheries Assessment Analyst and as a Scientific and Technical Officer for the Marine Institute in Ireland. This work involved fisheries research and stock assessment for ICES working groups. The work also involved coordination and management of a Fisher Self sampling program in the Irish Sea, with particular emphasis on spatial and temporal discard measurement tools.

Vito Ciccia Romito (Information Management, Team Support)

Vito holds a BSc in Ecology and an MSc in Tropical Coastal Management (Newcastle University, United Kingdom). His BSc studies focused on bycatch, discards, benthic impact of commercial fishing gear & technical solutions, after which he spent a year in Tanzania as a Marine Research officer at the Mafia Island Marine Park. Subsequently for his MSc, he focused on fisheries assessment techniques, ecological dynamics of overexploited tropical marine ecosystems, and evaluation of low-trophic species aquaculture as a support to artisanal reef fisheries.

Dave Garforth (Lead Assessor)

Dave Garforth, BSC, HDip. (Applied Science), MSC has been involved in fisheries and aquatic resources for over 20 years. Currently, managing Global Trust FAO-Based Fishery Certification Program, with experience in the application of ISO/IEC Guide 65 based seafood certification systems and a professional background in numerous fishery assessments. Previous professional background includes; Development Officer in the Irish Sea Fisheries Board, supply chain and trade experience at Pan European Fish Auctions, the control and enforcement of fisheries regulations as a UK Fishery Officer. Dave is also a lead, third party IRCA approved auditor.

Appendix 2

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

Herman Savikko

Herman Savikko has a degree in Biological Sciences and began his career in fisheries in 1975, working seasonally for the Alaska Department of Fish and Game in remote locations, including four Bristol Bay river systems and the Karluk River on Kodiak Island and several sockeye/Chinook salmon enumeration and escapement projects. Later, at the National Marine Fisheries Service at their Auke Bay Biological Laboratory, Mr. Savikko researched the early marine survival of pink and chum salmon throughout Northern Southeast Alaska and then gained hatchery experience at a private, non-profit hatchery on Gastineau Channel. Throughout a 30 year career at Alaska Department of Fish and Game, Mr. Savikko worked in the Divisions of Sport Fish, Fisheries Rehabilitation, Enhancement and Development, and Commercial Fisheries. His responsibilities covered freshwater and marine species management, research, and policy development. Mr. Savikko compiled and reported statewide salmon harvest data by management area, as well as maintaining the Commercial Operators Annual Report. As a member of the Commissioner's team, he helped develop, draft and implement salmon bycatch limits for the Bering Sea pollock fleet, as well as develop the foundation for bycatch measures in the Gulf of Alaska trawl fisheries.

Timothy L Joyce

Timothy Joyce holds a degree in Fishery Science from Oregon State University Corvallis and has over 30 years experience in Alaska salmon management. He has worked in hatchery management for Kitoi Bay, in common property resource harvest management and in regional fishery planning processes for Kodiak Island. Mr. Joyce worked as an Area Manager and Resource Management Biologist in Cordova with overall responsibility for regulation and harvest management of commercial salmon purse seine fisheries. In the mid nineties, working as an Area Resource Biologist, Mr. Joyce was involved in the transition from coded wire tags as a marking tool to an otolith bone mark as a method for distinguishing hatchery produced salmon. Also of note, he managed the development of a statistically defensible sampling protocol to determine the catch contribution of each individual hatchery and of wild salmon stocks in the commercial fishery in Prince William Sound. Since 2001, Mr. Joyce has worked as Program Manager for the USDA Forest Service in Prince William Sound. Mr. Joyce remains knowledgeable on the Alaska salmon management system, providing advice on gear types, harvest limits and areas open for subsistence fishing.

Appendix 3

Statewide Alaska salmon fishery locations

(Maps available at http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/maps/map_home.php)

Region 1. Southeast/Yakutat area.

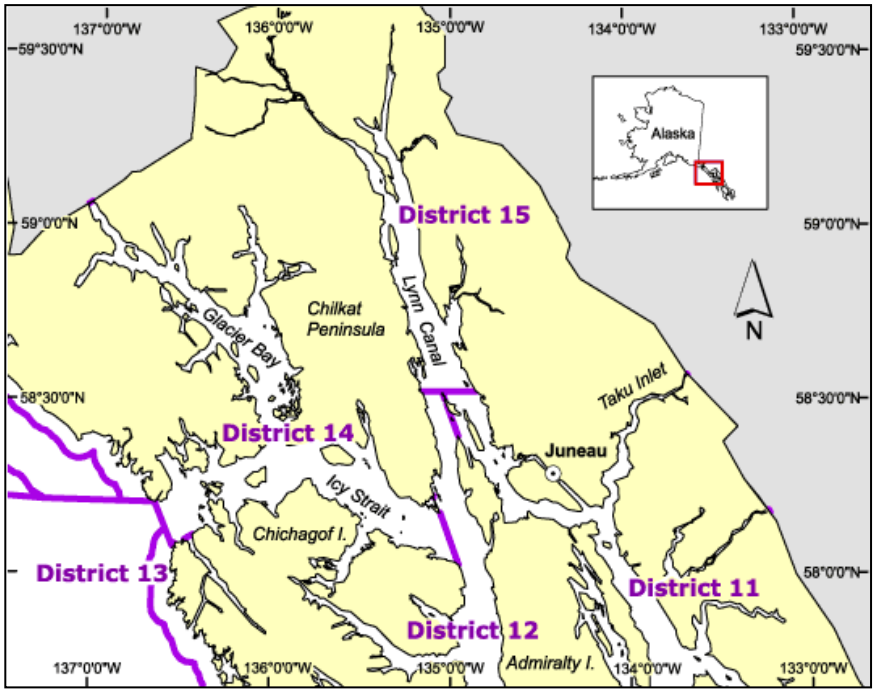

Figure 1. Juneau & Northern Southeast Alaska Salmon Districts

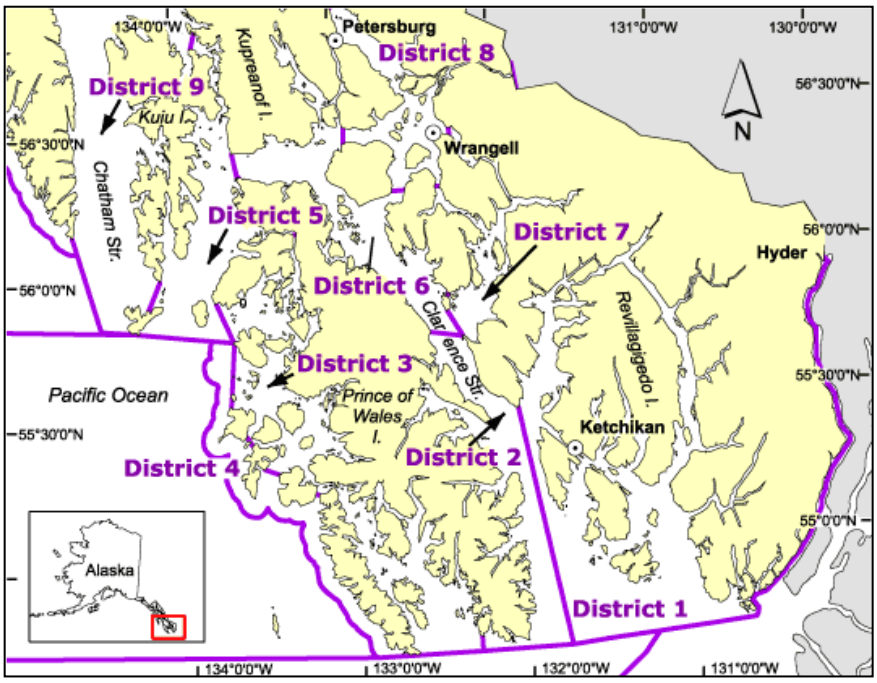

Figure 2. Ketchikan & Southern Southeast Alaska Salmon Districts

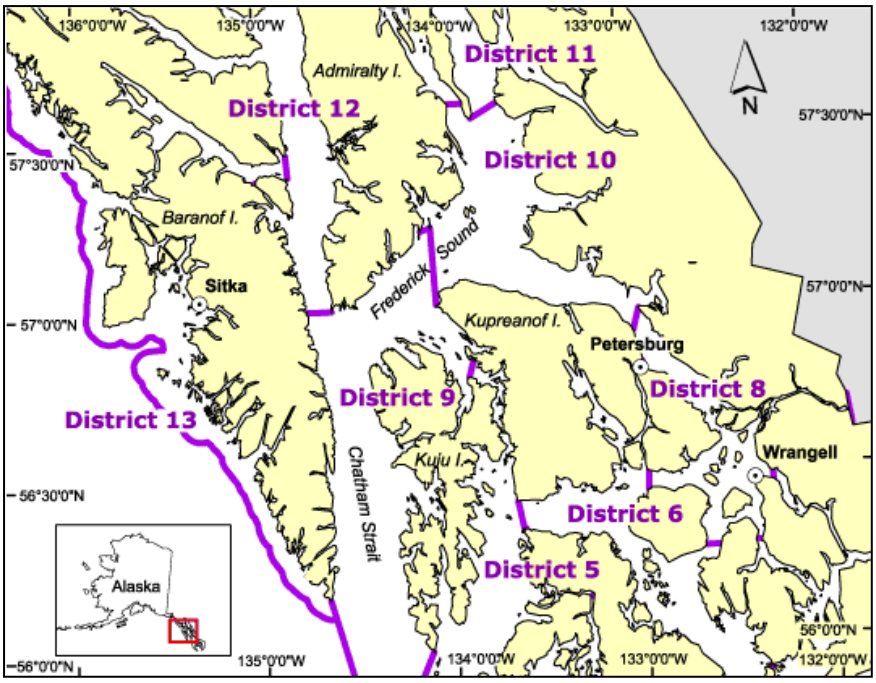

Figure 3. Sitka and Central Southeast Alaska Salmon Districts

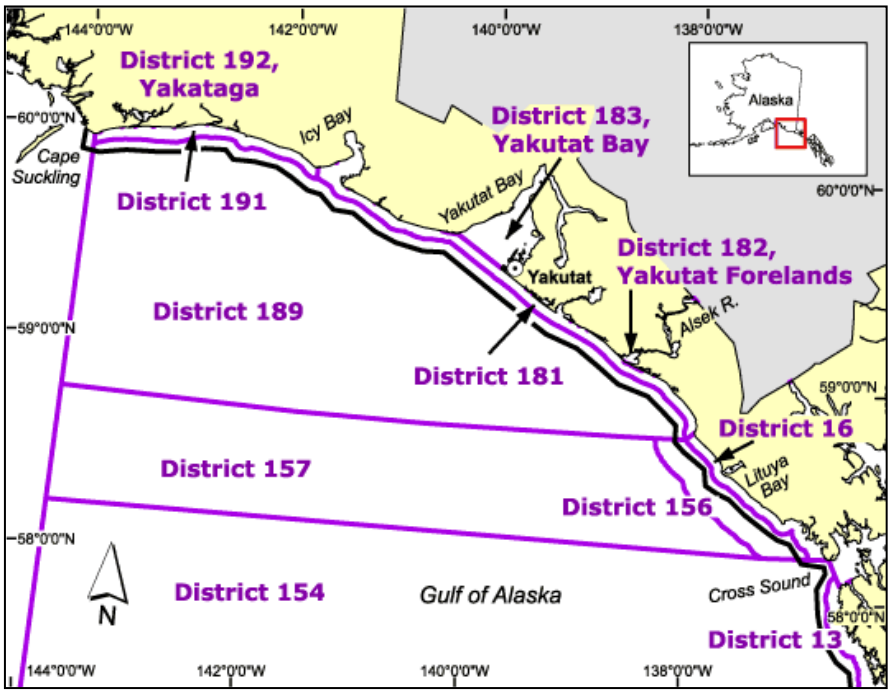

Figure 4. Yakutat and NW Southeast Alaska Salmon Districts

Region 2. Central : Prince William Sound, Cook Inlet and Bristol Bay area.

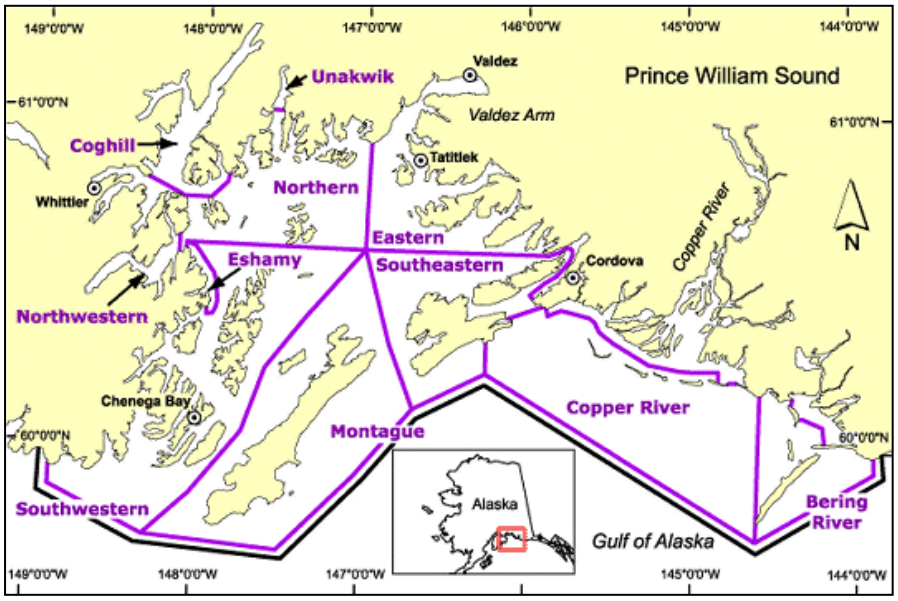

Figure 5. Prince William Sound Salmon Districts

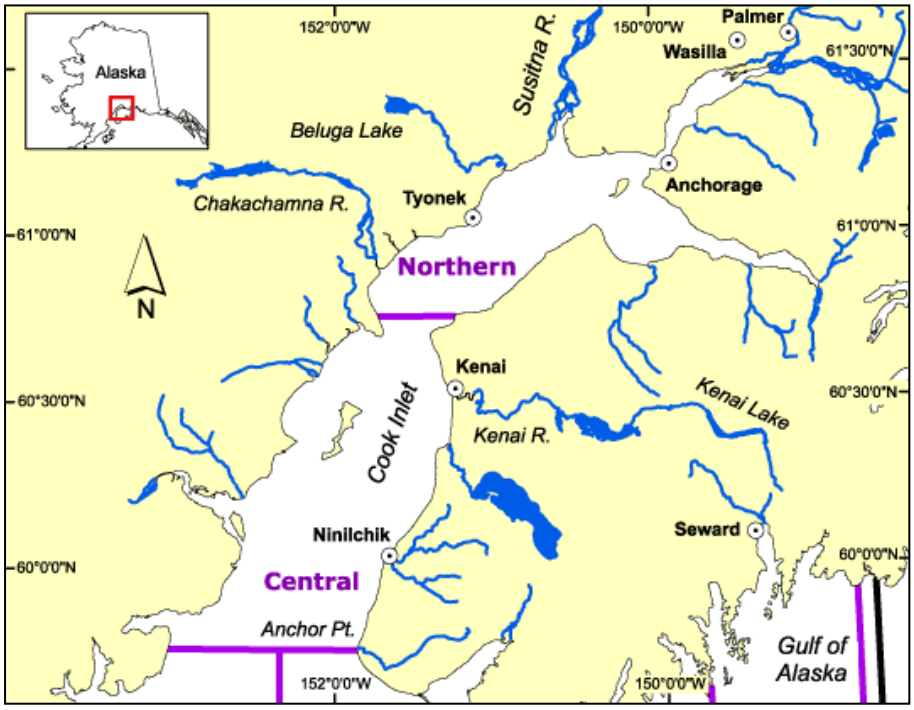

Figure 6. Cook Inlet Salmon Districts

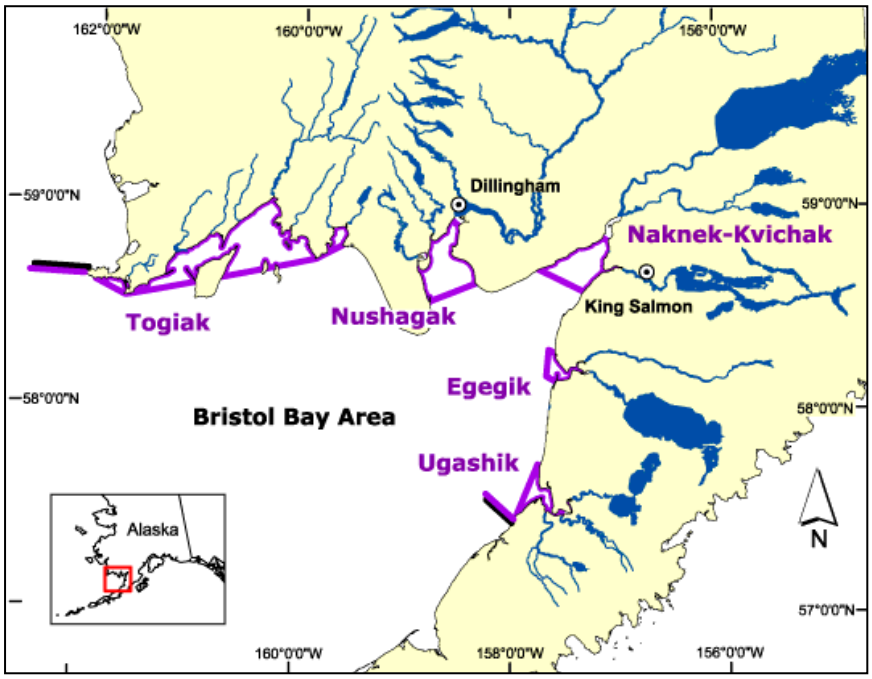

Figure 7. Bristol Bay Salmon Districts

Region 3. Arctic-Yukon-Kuskokwim area.

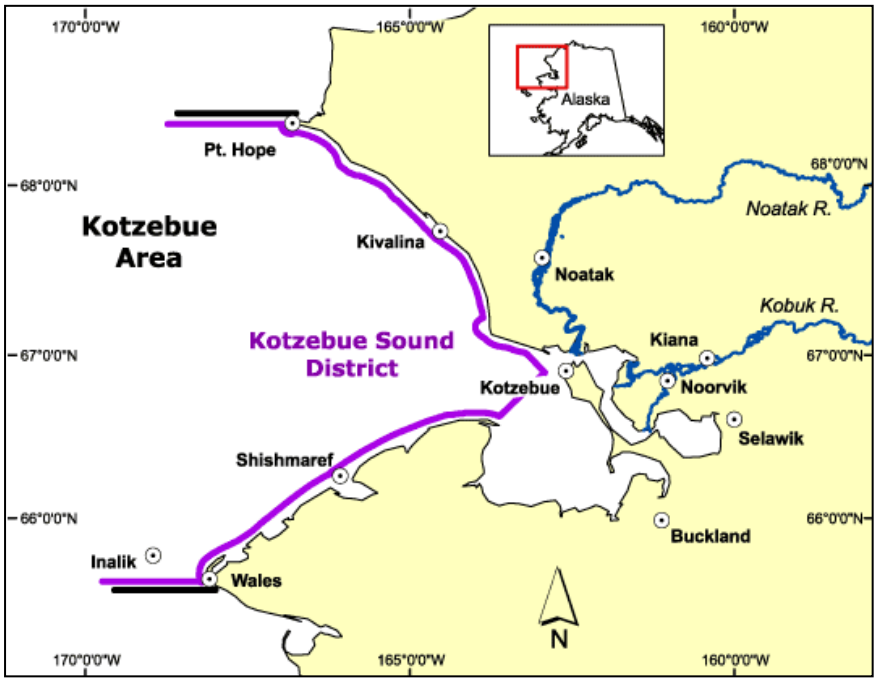

Figure 8. Kotzebue Area Salmon District

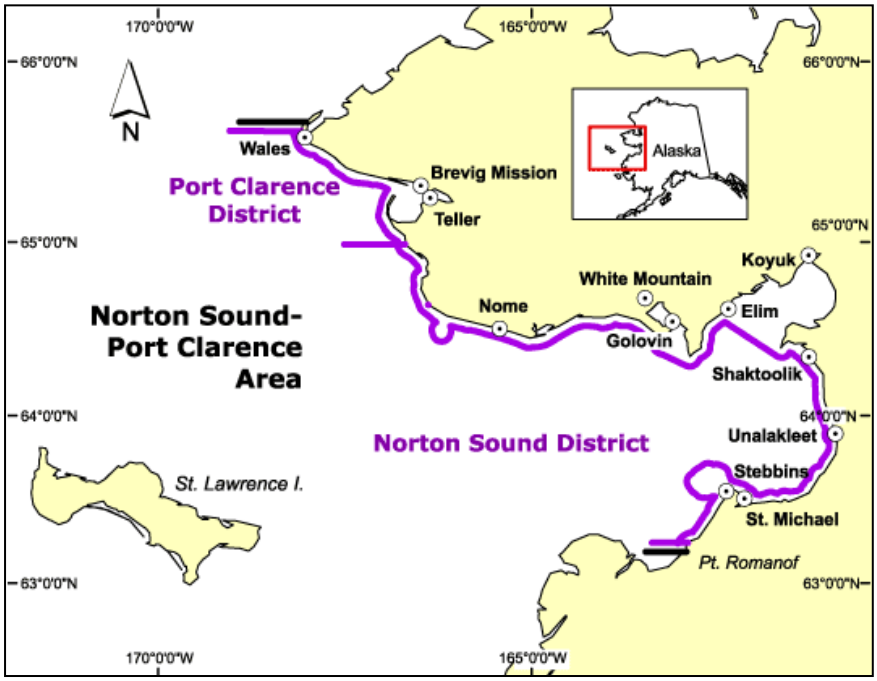

Figure 9. Norton Sound-Port Clarence Area Salmon Districts.

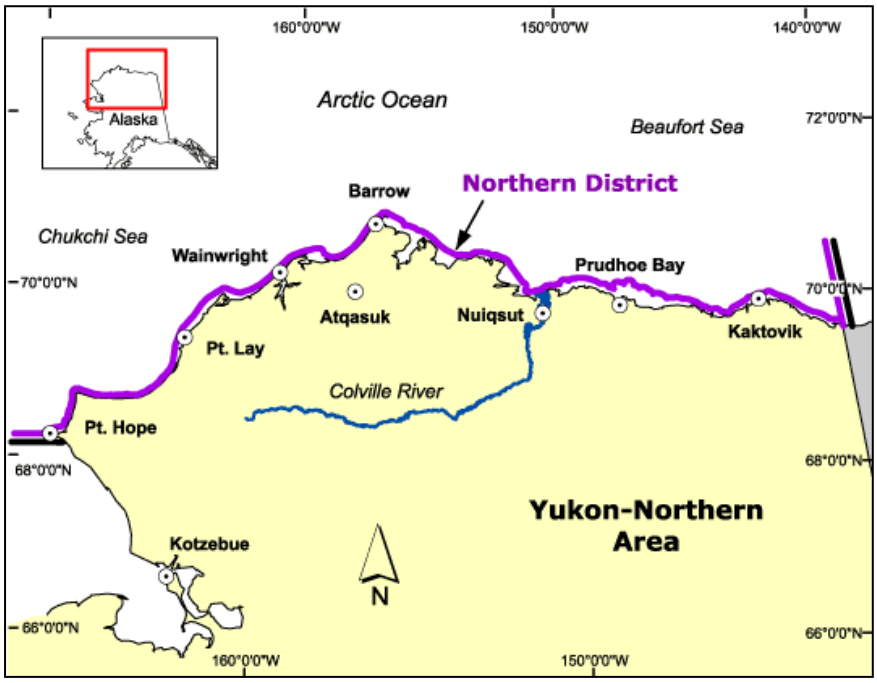

Figure 10. Yukon-Northern Area Salmon District

Figure 11. Upper-Yukon Area Salmon Districts.

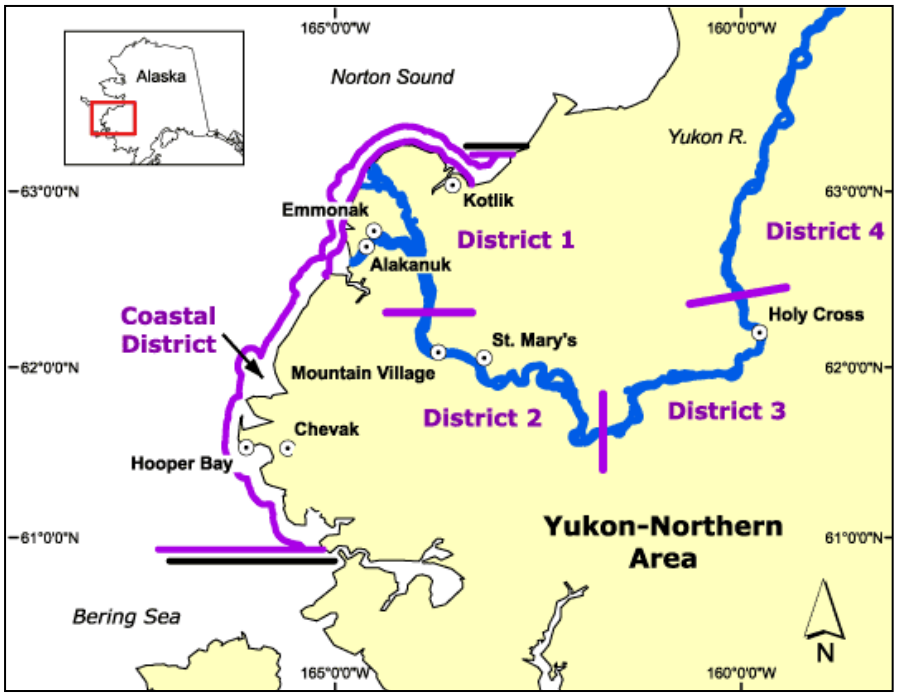

Figure 12. Lower-Yukon Salmon Districts

Figure 13. Kuskokwim Area Salmon Districts

Region 4. Westward: Kodiak, Aleutians and Chignik area.

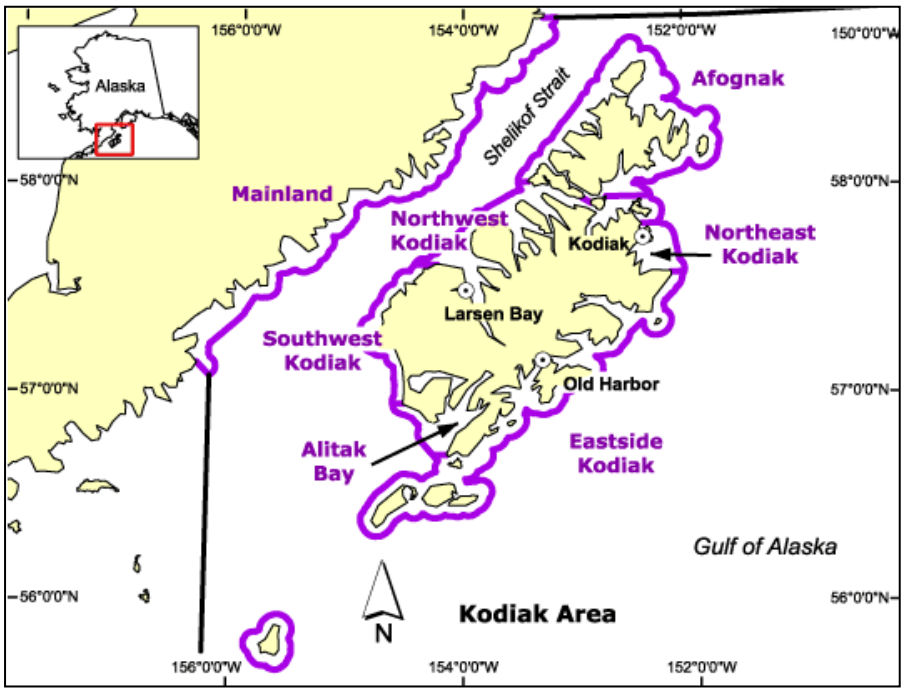

Figure 14. Kodiak Area Salmon District.

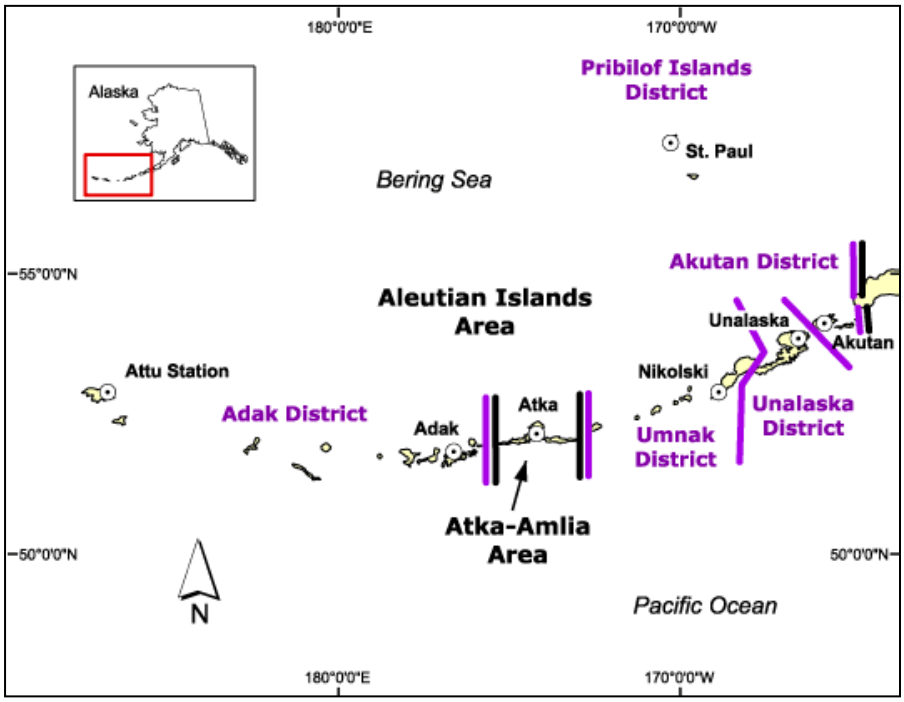

Figure 15. Aleutian Islands Area Salmon Districts.

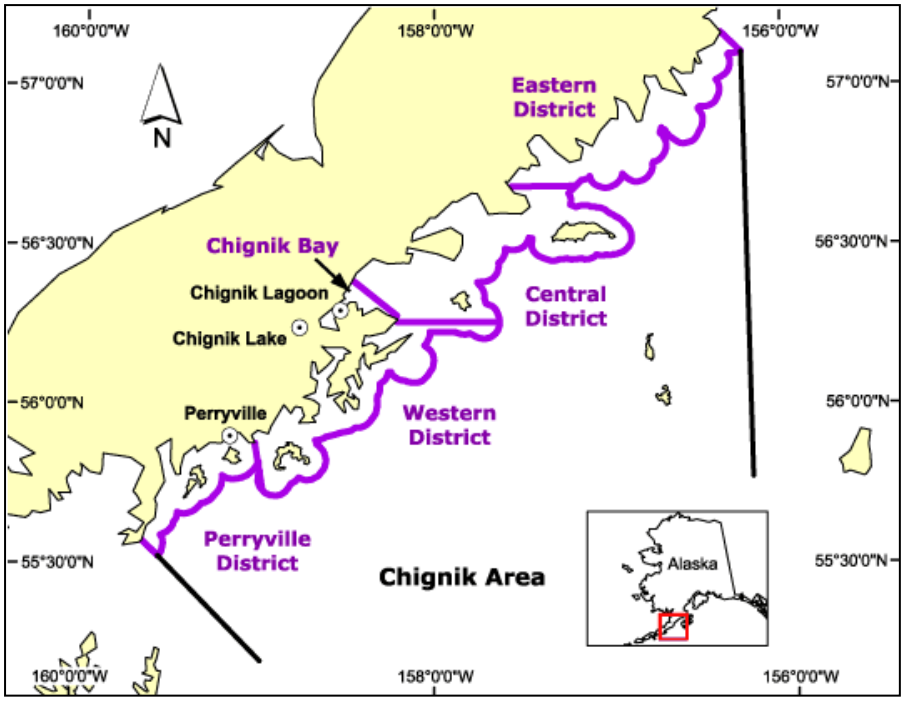

Figure 16. Chignik Area Salmon Districts.

Appendix 4

Hatchery summary by region.

Here below follows an acronym table and a list of hatcheries for salmon fisheries enhancement operating at present in Alaska with information on estimated returns for harvest in 2010.

Table 1. List of hatchery acronyms used in the following table.

Acronym	Organization
AKI	Armstrong-Keta, Inc.
CIAA	Cook Inlet Aquaculture Association
DIPAC	Douglas Island Pink and Chum, Inc.
KNFC	Kake Nonprofit Fisheries Corporation
KTHC	Ketchikan Tribal Hatchery Corporation
KRAA	Kodiak Regional Aquaculture Association
NSRAA	Northern Southeast Regional Aquaculture Association
POWHA	Prince of Wales Hatchery Association
PWSAC	Prince William Sound Aquaculture Corporation
SSRAA	Southern Southeast Regional Aquaculture Association
VFDA	Valdez Fisheries Development Association

Source: http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf.

Area/Operator/Location		Pink	Chum	Coho	Chinook	Sockeye	Other	Total
Southeast								
SSRAA	Whitman Lake			27,000	16,800			43,800
	Nakat Inlet		261,000	20,000				281,000
	Anita Bay		279,000	20,000	8,700			307,700
	Kendrick Bay		430,000					430,000
	Bakewell Lake			15,000				15,000
	Neets Bay		1,321,000	165,000	14,400			1,500,400
	Burnett Inlet			21,000				21,000
	Neck Lake			85,000				85,000
	Crystal Lake			3,900	1,700			5,600
NSRAA	Hidden Falls		1,625,000	287,100	5,300			1,917,400
	Medvejie Creek		935,000	9,700	23,800			968,500
	Haines projects		16,300					16,300
AKI	Port Armstrong	428,770	249,357	242,432	4,112			924,671
DIPAC	Macaulay							
	Gastineau Channel		824,000	28,000	3,700			855,700
	Amalga Harbor		947,000					947,000
	Boat Harbor		231,000					231,000
	Limestone Inlet		149,000					149,000
	Pullen Creek				1,600			1,600
	Snettisham					198,000		198,000
	Sweetheart Lake					3,400		3,400
	Taku River					–[a]		
	Stikine River					–[a]		
KTHC	Deer Mountain			4,593	528		25	5,146
KNFC	Gunnuk Creek	29,030	58,785	741				88,556
	Southeast Cove		66,726					66,726
SJC	Indian River/Deep Inlet	43,171	156,422	5,900	555			206,048
Federal	Little Port Walter				1,210			1,210
MIC	Tamgas		221,000	120,000	3,500	3,000		347,500
POWHA	Klawock			223,697				223,697
	Port Saint Nicholas				6,000			6,000
	Coffman Cove				1,600			1,600
Southeast Totals		500,971	7,770,590	1,279,063	93,505	204,400	25	9,848,554
Prince William Sound								
PWSAC	Armin F. Koernig	6,500,000						6,500,000
	Wally Noerenberg	5,800,000	3,550,000	18,000				9,368,000
	Cannery Creek	6,300,000						6,300,000
	Main Bay					836,000		836,0000
	Gulkana					190,000		190,000
VFDA	Solomon Gulch	10,632,000		178,228				10,810,228
Prince William Sound Totals		29,232,000	3,550,000	196,228		1,026,000		34,004,228
Cook Inlet								
CIAA	Trail Lakes							
	Homer Spit			1,500				1,500
	Hazel/Leisure					71,300		71,300
	Kirschner Lake					11,400		11,400
	Hidden Lake					70,100		70,100
	Bear Lake			6,200		188,000		194,200
	Big Lake					92,700		92,700
	Tutka Bay Lagoon					43,200		43,200
ADF&G	Ship Creek Complex[b]			49,322	12,583		53,685	115,590
Cook Inlet Totals				57,022	12,583	476,700	53,685	599,990
Kodiak								
KRAA	Kitoi Bay	5,963,777	273,668	164,449		71,244		6,473,138
	Pillar Creek			1,600	550	164,000		166,150
Kodiak Totals		5,963,777	273,668	166,049	550	235,244		6,639,288
Statewide Totals		35,696,748	11,594,258	1,698,362	106,368	1,942,344	53,710	51,092,060

[a] Not available in time for publication.
[b] Ship Creek Complex is the combination of Elmendorf Hatchery and Fort Richardson Hatchery.

Figure 1. Projected adult returns, by species, to Alaska enhancement projects in 2010

Source: http://www.sf.adfg.state.ak.us/FedAidpdfs/FMR10-05.pdf

Appendix 4b

Economic Impact of Salmon Hatcheries for Fisheries Enhancement in Alaska

1) Private Nonprofit Aquaculture Associations in Southeast Alaska

The Northern Southeast Regional Aquaculture Association (NSRAA), Douglas Island Pink and Chum, Inc. (DIPAC), and Southern Southeast Regional Aquaculture Association (SSRAA), Southeast Alaska's three largest hatchery associations have contributed millions of pounds of fish to commercial, charter, sport, personal use, and subsistence fisheries, resulting in a significant input into the regional and state economies of Alaska in 2008. In 2008, hatchery operations and the commercial harvesting and processing of salmon produced by NSRAA, DIPAC, and SSRAA generated total direct, indirect, and induced economic output of $171 million.

Total Economic impacts

In 2008, direct, indirect, and induced employment and payroll generated as a result of NSRAA, DIPAC and SSRAA operations totaled 971 jobs and $50 million in labor income. Direct employment is estimated at 662 with $33 million in labor income in 2008, while economic multiplier impacts (indirect and induced) of the rearing, harvesting, and processing of hatchery-produced salmon added 309 jobs and $17 million in labor income.

Commercial ex-vessel volume and value

In CPF from 2001 to 2008, the commercial fleet harvested 326 million pounds worth $130 million in ex-vessel value of salmon produced by NSRAA, DIPAC, and SSRAA. Cost recovery efforts added 210 million pounds of salmon worth $88 million. From 2001 to 2008, salmon reared by NSRAA, DIPAC, and SSRAA and harvested by commercial fishermen accounted for 30 percent of the ex-vessel value and 25 percent of the volume of the total Southeast Alaska salmon harvest.

Processors' First Wholesale Value and Gross Revenue

From 2001 to 2008, the first wholesale value (meaning the value of the products processed in Alaska before export) of processed salmon produced by these aquaculture organizations totaled nearly one-half billion dollars ($374 million) in first wholesale value for seafood processors. In 2008, seafood processors earned $98 million in first wholesale value by processing hatchery-produced salmon. From 2001 to 2008, processors earned $162 million in gross revenues (meaning the first wholesale value, less the ex-vessel price paid to fishermen) as a result of processing NSRAA, DIPAC, and SSRAA salmon. In 2008, seafood processors earned $40 million in gross revenue by processing hatchery-produced salmon.

Harvesters' Enhancement Tax Return on Investment

From 2001 to 2008, each $1 of voluntary salmon enhancement tax paid by harvesters returned $8.22 in ex-vessel value from the CPF (excluding cost recovery fisheries), and $10.27 in gross processing revenues (first wholesale value less ex-vessel value). In 2008, each $1 of voluntary salmon enhancement tax paid by Southeast fishermen generated $12.97 in ex-vessel value from CPF and $14.78 in gross processing revenues.

2) Economic Impacts of the Prince William Sound Aquaculture Corporation (PWSAC)

The Prince William Sound Aquaculture Corporation (PWSAC) is a private nonprofit corporation established to produce hatchery-born, ocean-raised wild salmon for the commercial, sport, personal use, and subsistence fisheries of the Prince William Sound region. PWSAC operations are financed primarily by a cost-recovery program and supplemented by a salmon enhancement tax paid by commercial fishermen.

In 2008, PWSAC's modest $6.4 million budget produced exponential economic returns to the regional and Alaska economies. Commercial harvesters (employing nearly 1,500 skippers and crew) earned $55 million by catching 115 million pounds of PWSAC salmon (Figure x below). Seafood processors then generated $202 million in first wholesale value (including ex-vessel payments to harvesters) by processing these fish in 2008. PWSAC salmon accounted for most of the region's 2008 salmon production: 68 percent of harvest volume and 70 percent of the ex-vessel value.

Total economic impacts in Alaska are even more substantial. Using Alaska economic multipliers, PWSAC salmon are estimated to have generated $317 million in total economic output, 1,024 in direct, indirect and induced employment, and $67 million in labor income for regional and statewide economies in 2008. Major economic benefits are widespread and accrue not only to Prince William Sound communities but to the Kenai Peninsula, Anchorage, and Mat-Su economies as well. Commercial harvesters from 35 Alaska communities earned income from PWSAC salmon. Residents of more than 40 Alaska communities harvested PWSAC sockeye for personal use and subsistence. In addition, the Prince William Sound personal sport and sport charter fisheries benefit from the Wally Noerenberg facility's coho production http://www.pwsac.com/PWSAC%20Economic%20Impact%20Study%202010.pdf.

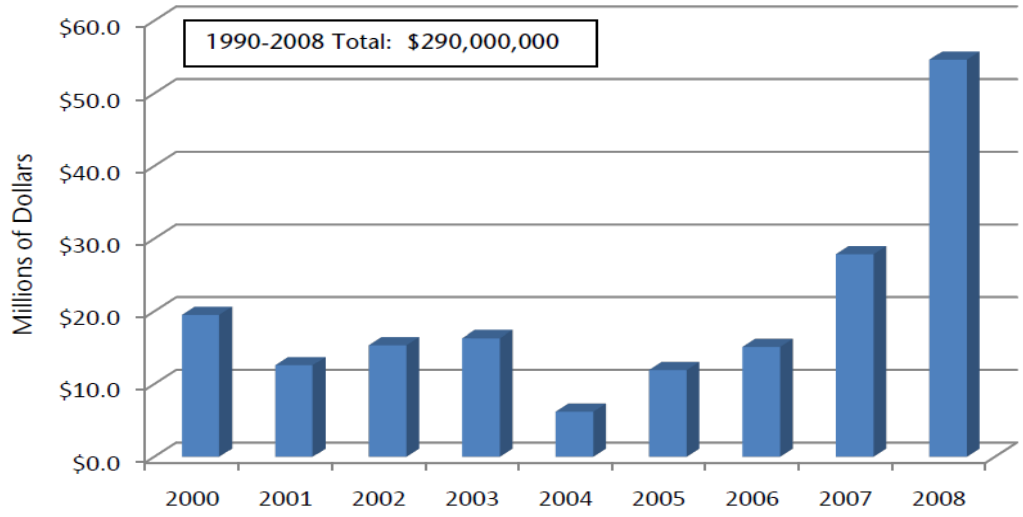

Figure 1 : Ex-vessel Value of Common Property Commercial Harvest of PWSAC Salmon, 2000-2008

Source ADFG and McDowell Group estimates.
http://www.pwsac.com/PWSAC%20Economic%20Impact%20Study%202010.pdf

Additional reports of economic impact of Alaska' enhancement programs are publically available through ADFG at: http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesOtherInfo.reports.

Appendix 5

12th March 2011

Alaska Salmon Fisheries Certification

Certification Recommendation

A positive Certification determination has been awarded for the US *Alaska Commercial Salmon Fisheries* against the United Nations, Food and Agriculture Organization (FAO) based Responsible Fisheries Management criteria, by a Global Trust Certification Committee on March 11, 2011, after a twelve month independent assessment of the salmon fisheries.

The Certification covers the Alaska commercial salmon fisheries, including five species of Pacific Salmon:

i. King (or Chinook) *(Oncorhynchus tschawytscha)*
ii. Sockeye (or Red) *(Oncorhynchus nerka)*
iii. Coho (or Silver) *(Oncorhynchus kisutch)*
iv. Pink (or Humpback) *(Oncorhynchus gorbuscha)*
v. Keta (or Chum) *(Oncorhynchus keta)*

A Global Trust Certification Committee, composed of fishery, certification and accreditation experts, was tasked with a qualitative review of the formal processes, assessment reports and recommendations provided by the fishery Assessment Team and Peer Reviewers appointed to assess this fishery.

The Certification Committee unanimously agreed with the Assessment Team's findings that the applicant Alaska salmon fisheries are responsibly managed, by effective management institutions using robust fishery management plans based on good science.

The resulting certification communication for the Alaska commercial salmon fisheries is 'Certified Responsible Fisheries Management'.

This Certification delivers high confidence that reliable management systems are in place to properly assess and respond to any current and evolving issues and allow the fishery to continue on the path of sustainable and responsible management. These management systems are certified as being in line with those recommended by the FAO Code of Conduct for Responsible Fisheries (1995).

This Certification demonstrates responsible management for the sustainable use of the fisheries and is a realistic and tangible communication for this standard and process. The Certification lasts for five years and it involves annual surveillance assessments of the fisheries. This Certification means that the Alaska Commercial Salmon Fisheries have met the criteria for certification of responsibly managed fisheries at the point in time of the assessment. This certification does not certify that the

fisheries will remain responsibly managed in the future. Thus the reason there are annual surveillance assessments.

The Alaska salmon fisheries scored highly against all FAO-based criteria. There were zero non-conforming areas recorded by the Assessment Team and these findings were supported by separate, peer review evaluations. A vast amount of information has been collated and recorded regarding the applicant fisheries, all of which were considered in the assessment. The assessment findings have been summarized in a 250 page Full Assessment and Certification Report.

The Certified salmon fisheries employ a variety of gear types in the four administrative regions of Alaska which are principally managed by the Alaska Department of Fish and Game (ADFG). Almost all of Alaska's salmon fisheries take place within state internal waters (0-3 nm, and other enclosed waters).

The assessment process has layers of governance and transparency. The assessment was conducted by Global Trust Certification according to its (International Standards Organizations) ISO 65 procedures for FAO-based Responsible Fisheries Management Certification. ISO 65 is the international accreditation criteria for bodies offering product and process certification. The ISO 65 assessment, certification and decision process is governed by the accreditation bodies of the International Accreditation Forum.

The established FAO Criteria for the fishery assessment were based on key standard documents. These documents included the FAO-based Responsible Fisheries Management Conformance Criteria (Version 1, July 2010), as derived from FAO Code of Conduct for Responsible Fisheries (1995), and the minimum criteria set out for marine fisheries in the FAO Guidelines for the Eco-Labeling of Fish and Fishery Products from Marine Capture Fisheries (2005/2009).

Certification for the Salmon Fishery is for a 5 year period after which the fishery will re-enter full assessment. In the intervening years, the fisheries will be subject to annual surveillance assessment to confirm that the fishery continues to meet the requirements for certification.

The Full Assessment and Certification report (250 pages) will be available for download Global Trust's website beginning March 28, 2011. Go to: www.GTCERT.com and http://sustainability.alaskaseafood.org/salmon-certification

Key Contacts:

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ASMI : Mr. Randy Rice: rrice@alaskaseafood.org

Summary of the Process

The Alaska Seafood Marketing Institute (ASMI), on behalf of Alaska Salmon fisheries, submitted an Application to Global Trust Certification for a formal assessment of the Alaska commercial salmon fisheries to the requirements of the FAO-Based Responsible Fisheries Management (RFM) Certification Program. The Application was made in April 2010 (Table 1).

After an initial Validation Assessment (Table 2) was completed by Global Trust in August 2010, an expert Assessment Team was formed to undertake the full assessment. The six person team was composed of independent assessors (Table 3) with expert competency in Pacific salmon fisheries, the Alaska management system and FAO assessment criteria.

The Assessment Team's report was Peer reviewed by two additional independent experts (Table 4) before being submitted to a formal five person, independent Global Trust Certification Committee (Table 5) for an independent certification decision.

Key factors and issues evaluated, documented and judged by the Assessment Team included:

A. The Fisheries Management System

Alaska's salmon fisheries are managed under a clear structure of laws, regulations, treaties, and other legal mandates and instruments. This management process is well-established and transparent. The Magnuson-Stevens Fishery Conservation and Management Act is the primary domestic legislation governing the management of American fisheries. For the State of Alaska, Article VIII, Section 4 (Sustained Yield) of Alaska's Constitution prescribes that replenishable resource such as fish belonging to the State shall be utilized, developed, and maintained on the sustained yield principle. Alaska Department of Fish and Game (ADFG) Commercial Fisheries Division is responsible for conservation of Alaska's salmon stocks and for management of the commercial fisheries. ADFG's main priority is achieving escapement, which ensures that enough salmon escape the fisheries, and spawn in their natal rivers. Management plans are established by the Alaska Board of Fisheries for each Region, incorporated into regulation in Title 5 Alaska Administrative Code, and available for timely implementation by the responsible ADFG area biologists.

B. Science and Stock Assessment Activities

ADFG operates an efficient data collection and analysis system that is effective in managing Alaska's salmon resources. ADFG is responsible for acquiring fishery dependant and independent information necessary to effectively manage commercial, sport, subsistence, and personal use fisheries. Each year, ADFG staff located throughout the state define the data needs for management of each salmon fishery, develop statistically valid study designs, and collect, analyze, and report the data necessary for effective fisheries management plans. Each step of this process is guided by state policies, statutes, and/or nationally recognized scientific standards. ADFG maintains a large staff of research and management biologists (totaling over 350), located throughout the state, who are responsible for supervising the field data collection, laboratory work, data analysis, and reporting. The State has also numerous cooperative technical, stock assessment, and management interactions

with other States and management organizations that deal with trans-boundary salmon stocks that are harvested in Alaska.

C. The Precautionary Approach

There was strong evidence of a precautionary approach used by management and specifically, for defining and identifying the reference points for salmon fisheries. For example, there is provision of detailed regulations and availability of stock status management reports. The primary reference points used for salmon management are escapement goals. All of Alaska's salmon fisheries have been divided into individual runs, or aggregates of runs, for management purposes. For each individual run, or stock aggregates, an escapement goal has been established. In-season management tools, principally the Emergency Order, gives local ADFG staff the authority to effectively close fisheries in real time to allow a high likelihood that escapement goals are met for the protection of spawning escapement. State Regulation, the Policy for the Management of Sustainable Salmon Fisheries, codifies the precautionary approach for regulation of salmon fisheries and for habitat conservation. The statewide Sustainable Salmon Policy requires the ADFG to routinely provide regional stock status reports, escapement goal reviews, and action plans that include management directives to promote recovery of any stocks of concern.

D. Management Measures

The Alaska Commercial Fisheries Entry Commission (CFEC) limits the number of participating fishers to provide economic stability in Alaska fisheries. Permits and vessel licenses for each gear type are issued to qualified individuals and there is a transparent process for appealing decisions made by CFEC.

Biologically established Escapement Goals (BEGs) form the principal control rule for setting harvest limits. BEGs are usually established using stock-recruit information which generally requires multiple years of run reconstructions to establish. A Sustainable Escapement Goal (SEGs) is the level of past escapement that has resulted in sustainable yield over a 5-10 year period. SEGs are used when data are insufficient to establish a BEG, usually due to lack of stock specific harvest data. Two other, less common escapement goals are also defined in the Sustainable Salmon policy. An Optimum Escapement Goal (OEG) is a specific management objective for salmon escapement that considers biological and allocative factors and may differ from BEGs or SEGs. A Sustainable Escapement Threshold (SET) is a threshold level of escapement, below which the ability of the stock to sustain itself is jeopardized. Every three years each Alaskan administrative region updates its escapement information and submits a salmon stock status report to the Board of Fisheries (BoF).

The BoF considers these status reports and makes allocative decisions based on proposals and recommendations from all interests; including from fishing, other stakeholders, the State and the BoF itself. The process separates the conservation role of ADFG from the allocation role of BoF.

Time and area restrictions limit when and where specific fisheries occur, and restrictions are also imposed by regulation on all types of fishing gear. As discussed, Emergency Orders are used to close or limit access to fisheries based on information on run strength and escapement goals.

E. Implementation, Monitoring and Control

The salmon management program conducted by ADFG is a responsive and adaptive program. It monitors salmon abundance during the fishing season and makes continual adjustments in fishing time and area based on observed escapements, commercial fishery performance, test fishing, biological data on age, sex and size, historical run timing curves and other data. Alaska Statutes Title 16 (AS16) and Alaska Administrative Code Title 5 (AAC5) enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation. Withdrawal or suspension of authorizations to officers of a fishing vessel is also among the enforcement options. The Alaska Wildlife Troopers (AWT) Division is charged with protecting the state's natural resources. The U.S. Coast Guard (USCG) also enforces boating safety laws and fishing vessels. For fisheries under federal management, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Office for Law Enforcement (OLE) enforces federal laws that protect and conserve Alaska's living marine resources and their habitat. Cooperation and coordination among ADFG, AWT, USCG, and OLE is frequent and routine. As noted, the Alaska Limited Entry system (CFEC) only allows legally permitted vessels to operate in salmon fisheries.

F. Serious Impacts of the Fishery on the Ecosystem

Alaska's Sustainable Salmon Policy includes provisions addressing the potential effects of ecological changes/perturbations on sustainably allowable salmon harvest and maintenance of normal ecosystem functioning. Potential ecological effects on salmon stocks are incorporated in the establishment of escapement goals for each stock. Fishing gear employed for harvest of Alaska salmon is not considered to have habitat disturbance impact on the fisheries and ecosystems. Ocean ranching and salmon fishery enhancement is practiced widely for the purpose of ensuring common property fisheries. These activities, i.e., salmon hatcheries and the harvest of the salmon they produce, are strictly regulated by the state through the ADFG so as to avoid or minimize effects on genetic diversity of wild salmon and ecosystem integrity caused by stray hatchery returns and density dependent factors. Whilst there is evidence of hatchery straying, a considerable amount of research by ADFG, the North Pacific Anadromous Fish Commission, and NOAA focuses on the quantification, ecological interaction of hatchery released and wild salmon in Alaska, marine ecology of juvenile salmon and density dependent growth factors in the high seas. NOAA's time-series and process-oriented studies have revealed no compelling evidence of ecological interaction of hatchery and wild salmon in the coastal marine habitat.

Further Information.

Full Assessment outcome summaries can be found in the Full Assessment and Certification Report which will be posted on the Global Trust website, www.gtcert.com and Alaska seafood website, http://sustainability.alaskaseafood.org/salmon-certification after March 28, 2011

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Chain of Custody Details: mikeplatt@GTCERT.com

General Comments: info@GTCERT.com

Table 1: Fishery Application Summary

Applicant Contact Information			
Organization/ Company Name:	**Alaska Seafood Marketing Institute on behalf of Alaska Salmon Fisheries**	Date:	**April 2010**
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Phone:	**(907) 465-5560**	**E-mail Address:**	***info@alaskaseafood.org***
Key Management Contact Information			
Full Name:	*(Last)* **Rice**	*(First)* **Randy**	
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Country:	**USA**		
Phone:	**(206) 352-8920**	**E-mail Address:**	*marketing@alaskaseafood.org*
Nominated Deputy:	**As Above**		
Deputy Phone:	**As Above**	**Deputy E-mail Address:**	**rrice@alaskaseafood.org**

Table 2: Schedule of Key Assessment Activities

Assessment Activities	Date (s)
Application Date	April 2010
Initial Site Visit Consultation Meetings	June –July 2nd 2010
Initial Validation Assessment Report	August 2010
Appointment of Full Assessment Team	September- October 2010
On-site Witnessed Assessment and Consultation Meetings	Nov 15th-19th and Dec 2nd-8th 2010
Draft Assessment Report	February 10th 2011
External Peer Review	February 12th 2011
Final Assessment Report	March 1st 2011
Certification Review/Decision	March 2011

Table 3: Global Trust Assessment Team Members

Assessor	Role	Assessor	Role
Dave Garforth, Global Trust Certification Ltd. Rivercentre, Riverlane Dundalk, Co. Louth Ireland	Assessment Leader	**Deirdre Hoare,** Global Trust Certification Ltd. Rivercentre, Riverlane Dundalk, Co. Louth, Ireland	Assessor
William Smoker, 413 SW Butterfield Pl Corvallis, OR 987333 USA	Assessor	**Steven McGee ,** 163 Birdsong Lane Port Angeles, WA 98362 USA	Assessor
Rolland Holmes, 2913 Blueberry Hills Rd. Juneau, AK 99801 USA	Assessor	**Stephen Grabacki ,** Graystar P.O.Box 100506 Anchorage, Alaska USA	Assessor

http://sustainability.alaskaseafood.org/wp-content/uploads/2010/06/Confirmation-of-Assessment-Team-Members-Salmon-10-5-10.pdf

Table 4: Peer Reviewers

Herman Savikko	Timothy L Joyce
Herman Savikko has a degree in Biological Sciences and began his career in fisheries in 1975, working seasonally for the Alaska Department of Fish and Game in remote locations, including four Bristol Bay river systems and the Karluk River on Kodiak Island and several sockeye/Chinook salmon enumeration and escapement projects. Later, at the National Marine Fisheries Service at their Auke Bay Biological Laboratory, Mr. Savikko researched the early marine survival of pink and chum salmon throughout Northern Southeast Alaska and then gained hatchery experience at a private, non-profit hatchery on Gastineau Channel. Throughout a 30 year career at Alaska Department of Fish and Game, Mr. Savikko worked in the Divisions of Sport Fish, Fisheries Rehabilitation, Enhancement and Development, and Commercial Fisheries. His responsibilities covered freshwater and marine species management, research, and policy development. Mr. Savikko compiled and reported state-wide salmon harvest data by management area, as well as maintaining the Commercial Operators Annual Report. As a member of the Commissioner's team, he helped develop, draft and implement salmon by-catch limits for the Bering Sea pollock fleet, as well as develop the foundation for bycatch measures in the Gulf of Alaska trawl fisheries.	Timothy Joyce holds a degree in Fishery Science from Oregon State University Corvallis and has over 30 years experience in Alaska salmon management. He has worked in hatchery management for Kitoi Bay, in common property resource harvest management and in regional fishery planning processes for Kodiak Island. Mr. Joyce worked as an Area Manager and Resource Management Biologist in Cordova with overall responsibility for regulation and harvest management of commercial salmon purse seine fisheries. In the mid nineties, working as an Area Resource Biologist, Mr. Joyce was involved in the transition from coded wire tags as a marking tool to an otolith bone mark as a method for distinguishing hatchery produced salmon. Also of note, he managed the development of a statistically defensible sampling protocol to determine the catch contribution of each individual hatchery and of wild salmon stocks in the commercial fishery in Prince William Sound. Since 2001, Mr. Joyce has worked as Program Manager for the USDA Forest Service in Prince William Sound. Mr. Joyce remains knowledgeable on the Alaska salmon management system, providing advice

Table 5: Global Trust Certification Committee

Peter Marshall, Chairperson **Certification and Accreditation Expert** Global Trust Certification Ltd. Key Contact: petermarshall@gtcert.com	**Bill Paterson** **Legal / Technical / Accreditation Expert** Global Trust Certification Ltd.
Ciaran Kelly **Fishery Management Expert** Marine Institute. Ireland	**Clare Murray** **Fishery Scientist** Global Trust Certification Ltd.
Vito Romito **Fishery Scientist / Information Management** Global Trust Certification Ltd.	

