

Alaska Sustainable Salmon Fund (AKSSF)

Proposed Framework for Southeast Alaska for Federal Fiscal Year 2009

Introduction

The Alaska Sustainable Salmon Fund (AKSSF) Science Panel for Southeast Alaska will meet on September 9, 2008, in Juneau to develop recommended the AKSSF Call for Proposals for Southeast Alaska for Federal Fiscal Year (FFY) 2009.

The FFY 2009 Call for Proposals will be issued by the Alaska Department of Fish and Game (ADF&G) in mid-September 2008. The Call will solicit proposals for funding for projects related to three AKSSF goals:

- Goal 1 – Habitat
- Goal 2 – Salmon Stock Assessment
- Goal 3 – Salmon Management

To prepare for the 2009 funding cycle, two interagency groups met to consider the highest priority information needs/actions for the AKSSF in Southeast Alaska.¹ One group considered Goal 1: Habitat, the second considered Goal 2: Stock Assessment and Goal 3: Salmon Management.

This document presents the recommendations of the interagency groups, for the full Science Panel's consideration and discussion on September 9, 2008.

¹ Members of the Science Panel and the interagency groups are listed in Attachment 1. The 2008 AKSSF Call for Proposals for Southeast Alaska is in Attachment 2.

Southeast Region – Goal 1: Habitat

AKSSF Framework for Southeast Region – Goals 1

The interagency group that considered AKSSF Goal 1 in Southeast Alaska is recommending the following proposed Framework of objectives and information needs/actions for Goal 1: Habitat for 2009. The information needs/actions identified as the highest priorities to include in the 2009 Call for Proposals are shaded.

Changes from the language in the 2003 AKSSF Framework for Southeast Alaska are shown below. New wording is underlined; words to be deleted are shown with ~~strike through~~.

For the high priority information needs/actions that would be included in the 2009 Call for Proposals, more specific recommendations for the types of approaches needed to address the information need/action are provided. However, responses to the 2009 Call for Proposals need not be limited to the approaches/projects listed below. Proposals for other approaches/projects that would implement high priority information needs/actions are also encouraged.

GOAL 1 – HABITAT	
Protect and restore freshwater, estuarine, and marine salmon habitats to maintain resource productivity.	
Objective 1A. Identify, protect and manage spawning, incubation, rearing, <u>overwintering</u>, and migration habitats to mitigate or prevent <u>human-induced anthropogenic</u> perturbations beyond the bounds of natural variation.	
Information Need/Actions	Approach to Addressing Info Need/Action
(1A-1) Monitor development projects <u>or activities to ensure protection of salmon habitat.</u> construction and operation for compliance with permit requirements or conditions to ensure protection and effectiveness of permits.	- Focus on funding the evaluation of potential effects for development projects for which there is not a permitting agency that has funding and regulatory responsibility. For example, this funding source is particularly significant for transboundary development projects (e.g., Canadian mining projects) that do not require State of Alaska permits, but in which the State has a significant habitat protection interest.
(1A-2) Quantify flow requirements for life stages of salmon and <u>secure reservations of water.</u> reserve sufficient amounts of water.	- Develop water quantity estimation models that meet Alaska Department of Natural Resources (DNR) requirements for filing a reservation of water application. - Continue to collect water quantity and quality data in anadromous water bodies to obtain five years of record. - Continue to support preparation and adjudication of reservation of water applications which includes collection of water quantity and quality data to obtain five years of record.

Southeast Region – Goal 1: Habitat

Objective 1A - Continued	
Information Need/Actions	Approach to Addressing Info Need/Action
<p>(1A-3) <u>Develop and improve information sharing systems to provide managers and public readily available information on salmon habitat.</u> Develop information syntheses (summaries of analyzed information) and management sharing systems to provide managers and public readily available information on salmon habitat and existing and future land and water uses.</p>	
<p>(1A-4) Catalog anadromous water bodies.</p>	<ul style="list-style-type: none"> - Focus on areas of highest risk (e.g., where there is more frequency of development permit need).
<p>(1A-5) Identify <u>and analyze location and patterns of important salmon critical/essential spawning, incubation, rearing, overwintering, and migration habitat, including site-specific habitat characteristics (e.g., vegetation, substrate, hydrology/hydraulics, water quality) in freshwater, estuarine, or marine environments.</u></p>	<ul style="list-style-type: none"> - Collect information that provides site-specific habitat characteristics for Southeast Alaska salmon species and life stages. - Identify and analyze patterns of habitat arrangement in waterbodies, watersheds, and landscapes, to allow more predictive approach to identifying potential salmon habitat on a large-scale basis. - Focus identification and analysis of habitat on areas of highest risk of change or perturbation, including waterbodies most susceptible to effects of climate change. - Research and develop Habitat Suitability criteria for all life stages of salmon. - Better identify effects on variations of water quantity on different life-stages of fish. - Implement projects that help understand links between salmon habitat and salmon productivity. - Evaluate salmon use of naturally-turbid systems.

Southeast Region – Goal 1: Habitat

Objective 1A - Continued	
Information Need/Action	Approach to Addressing Info Need/Action
(1A-6) Establish baselines for water quality and quantity for selected <u>salmon water bodies, systems.</u>	<p><u>Water Quantity</u></p> <ul style="list-style-type: none"> - Establish stream gages in salmon producing waterbodies for scientists and managers to make scientifically sound water allocation and water quality decisions relating to water developments and land use practices that have the potential to impact water quantity and quality, salmon populations and habitat. - Develop new models or improve existing models to provide Geographic Information System (GIS) based approach for estimating seasonal and long-term flow predictions at ungaged sites with a measure of statistical confidence. <p><u>Water Quality</u></p> <ul style="list-style-type: none"> - Develop interagency program to collect system specific information on water quality (particularly in regard to fine sediment and effects to spawning habitat). - Evaluate hydrocarbon loading in selected high-motor use salmonid waterbodies, identify and implement actions to control water quality effects.
(1A-7) Analyze cumulative effects of human activity across spatial and temporal scales for watershed management on important salmon producing systems.	
(1A-8) Identify and assess marine areas for protection.	
(1A-9) Identify data that may be useful but has not been analyzed.	
(1A-10) <u>Evaluate the relationship between amount, quality, and pattern of habitat types and salmon productivity.</u> Understand linkages between amount and quality of habitat and salmon productivity.	

Southeast Region – Goal 1: Habitat

Objective 1B. Detect and predict <u>short- annual and long-term anthropogenic and natural changes and trends in salmon habitat.</u>	
Information Need/Actions	Approach to Addressing Info Need/Action
(1B-1) <u>Evaluate ocean conditions and cycles that affect nearshore salmon productivity.</u> Understand ocean conditions that affect early marine survival.	
(1B-2) <u>Evaluate the individual and cumulative effects of human activities on salmon habitat.</u> Understand the effect of human activities on salmon habitat.	- Focus on evaluating <u>cumulative</u> effects of actions with potential regionally-broad impacts on salmon habitat or productivity (e.g., off-highway vehicles (OHV), loss of riparian zones, stormwater run-off).
(1B-3) Research short term (5-25 year) oceanic cycles and effects on salmon.	
(1B-4) <u>Detect and evaluate understand effects of global climate change on salmon habitat.</u>	- Improve snow, rainfall, and temperature distribution models to better predict changes in stream hydrology and temperature under climate change scenarios. - Develop a regional risk assessment for watershed hydrograph sensitivity to predicted climate change to provide a base for a strategic climate change stream discharge monitoring network. - Develop geomorphic models to predict response of stream morphology and physical habitat to predicted changes in frequency-magnitude characteristics of salmon streams under climate change scenarios. - Link hydrologic model predictions to watershed water quality models to better predict physicochemical habitat conditions under climate change scenarios. - Compile and maintain legacy data sets. - Analyze response and resilience of salmon habitats to global climate change (especially changes in hydrology).
(1B-5) <u>Evaluate contaminant burdens in salmon.</u> for contaminant burdens.	
(1B-6) <u>Evaluate Understand</u> the role of salmon escapement in food webs of aquatic and terrestrial ecosystems.	

Objective 1B - Continued	
Information Need/Actions	Approach to Addressing Info Need/Action
(1B-7) Monitor long-term trends of smolt production.	
(1B-8) <u>Evaluate freshwater conditions and cycles that affect salmon productivity.</u> Understand freshwater conditions that affect salmon survival.	
(1B-9) <u>Evaluate estuarine conditions and cycles that affect salmon productivity.</u> Understand estuarine conditions that affect salmon survival.	
Objective 1C. <u>Restore habitat and fish passage that has been degraded by human activity.</u>	
Restore degraded habitat and salmon access to habitat.	
(1C-1) <u>Identify, assess, prioritize, and plan for restoration of fish passage and riparian, spawning, and rearing habitats that have been degraded by human activity.</u> Address fish passage that is restricted due to culverts, roads, and other structures and improve culvert design and identify fish movement to adequately design protection measures that minimize the impacts of culverts.	<ul style="list-style-type: none"> - Determine priorities for restoration based on a strategic planning process for fish passage remediation and habitat restoration opportunities (e.g., watershed restoration plan). - Determine effects of partial fish passage on salmon movements. - Consolidate existing road condition surveys into a common database, to determine fish passage remediation needs. - Characterize salmon movement in watersheds to inform and improve fish passage models and structure design. - Develop interagency guidance/acceptance for fish friendly off-highway vehicle road-stream crossing structures, once problem sites are identified. - Apply US Forest Service upstream fish habitat assessment protocol to state and private land road-stream crossings, to prioritize crossings for remediation.

Southeast Region – Goal 1: Habitat

Objective 1C – Continued	
Information Need/Action	Approach to Address Info Need/Action
<p>(1C-2) <u>Restore fish passage and riparian, spawning, and rearing habitats that have been degraded by human activity. The restoration project must include monitoring (commensurate to the project scale) that documents the project has been implemented as planned (e.g., built as designed, revegetated as planned, etc.).</u> Restore riparian, spawning, and rearing habitats that have been degraded by land management practices (e.g., urbanization, timber harvest).</p>	
<p>(1C-3) Conduct research on oil spill prevention and clean up.</p>	
<p>(1C-4) <u>Review and analyze effectiveness of mitigation/restoration projects, to continue to improve mitigation/restoration techniques.</u> Understand the long-term effectiveness of mitigation/restoration techniques.</p>	<ul style="list-style-type: none"> - Develop protocols for determining effectiveness for restoration activities. - Bring technical expertise to Alaska to assist in testing, demonstrating and implementing innovative restoration techniques that are successful elsewhere.
<p>Objective 1D. Evaluate the effectiveness of programs that protect, <u>maintain, and restore</u> salmon habitat and improve where appropriate.</p>	
<p>(1D-1) Evaluate existing statutes, regulations and policies and standards to ensure adequate protection of salmon habitat.</p>	
<p>(1D-2) Improve enforcement.</p>	
<p>(1D-3) Evaluate and improve protocols to monitor <u>the effectiveness of riparian standards and stream habitat protection measures.</u></p>	

Southeast Region – Goal 2: Stock Assessment

AKSSF Framework for Southeast Region – GOAL 2

The interagency group that considered AKSSF Goals 2 & 3 in Southeast Alaska is recommending the following proposed Framework of objectives and information needs/actions for Goal 2: Stock Assessment for 2009. The information needs/actions identified as the highest priorities to include in the 2009 Call for Proposals are shaded.

Changes from the language in the 2003 AKSSF Framework for Southeast Alaska are shown below. New wording is underlined; words to be deleted are shown with ~~strike through~~.

For the high priority information needs/actions that would be included in the 2009 Call for Proposals, more specific recommendations for the types of approaches/projects that are needed to address the information need/action are provided (following the Framework table).

GOAL 2 – SALMON STOCK ASSESSMENT Collect information needed to sustain high potential productivity of wild salmon <u>and steelhead</u> stocks.	
Objective	Information Need/Action
2A. <u>Assess salmon and steelhead escapements.</u> Estimate and periodically evaluate escapement goal approach and the biological <u>escapement</u> goal ranges to achieve sustained yield <u>and maintain production.</u>	(2A-1) Obtain reliable <u>temporal/spatial</u> estimates of escapements by age/sex/length.
	(2A-2) Identify the limiting factors for depressed stocks.
	(2A-3) Collect <u>and evaluate</u> data regarding harvest by stock by brood year, for hatchery and wild stocks.
	(2A-4) Develop data analyses, databases, or models for biological <u>establishing escapement goals or for fishery management needs.</u>
	(2A-5) Develop, evaluate, and implement methods to estimate escapement, including: developing cost effective technologies, evaluating existing escapement estimates and <u>developing cost effective technologies</u> to estimate a larger proportion of total escapements without increasing cost.
	ADD (2A-6) <u>Estimate freshwater smolt production and/or marine survival for key stocks of interest.</u>
2B. Develop <u>stock specific</u> methods to assess stock status, to apply in management systems to achieve escapement goals.	(2B-1) Determine genetic baselines <u>for management, conservation, and restoration efforts.</u> of all species to prioritize conservation and restoration efforts and predict and monitor effects of enhancement actions.
	(2B-2) Develop a list of stocks by stock status category <u>using available biological information.</u> and habitat condition, including identifying data gaps and where no information is available. (Ideally list by anadromous stream catalog number, aggregated to stock status [management unit] and include information that is known, such as harvest, escapement data).
	ADD (2B-3) <u>Develop cost-effective stock identification methods.</u>

Southeast Region – Goal 2: Stock Assessment

GOAL 2 - Continued	
Objective	Information Need/Action
2C. Identify and catalog management conservation units (stock aggregations, meta-populations).	(2C-1) Identify and assess conservation or management units for each species, <u>based on an understanding of the phenotypic and genotypic characteristics.</u>
	(2C-2) Collect phenotypic information: abundance, age and size structure, run and spawn timing.
	(2C-3) Collect genotypic baseline data (as per 2B-1) to describe relationships among demes, stock, conservation units, meta-populations.
2D. Establish information sharing system.	(2D-1) Standardize historical data to be usable in a data series for integrated analysis, including stock status and habitat quality.
	(2D-2) Develop public access to salmon and salmon habitat data via web.
	(2D-3) Improve data management infrastructure.
2E. Assess the affect of hatchery production, including supplementation and domestication, on wild salmon stocks.	(2E-1) <u>Quantify Assess genetic</u> straying rates.
	(2E-2) <u>Develop methods to determine acceptable straying rates.</u> Determine acceptable rates for genetic introgression.
	(2E-3) Assess ecological impacts of large-scale enhancement, including domestication, on wild stocks.
2F. Identify and assess the impact of invasive species (exotics) on wild salmon <u>and steelhead</u> , to minimize interaction.	(2F-1) Determine distribution and extent of <u>invasive non-indigenous</u> species in Southeast Alaska.
	(2F-2) Gather pre-invasion baseline.
	(2F-3) Determine the effects and potential effects of <u>invasive non-indigenous</u> species on wild salmon <u>and steelhead</u> .

Southeast Region – Goal 2: Stock Assessment

Goal 2 – Recommendations to Focus the Call for Proposals

The following approaches/projects are recommended to address the high priority information needs/actions highlighted above. These approaches/projects were identified through a gap analysis process. However, responses to the 2009 Call for Proposals need not be limited to the approaches/projects listed below. Proposals for other approaches/projects that would implement high priority information needs/actions are also encouraged.

Objective 2A: Assess salmon and steelhead escapements. Estimate and periodically evaluate escapement goal approach and the escapement goal ranges to achieve sustained yield and maintain production.

INFORMATION NEED/ACTION 2A-1 Obtain reliable temporal/spatial estimates of escapements by age/sex/length.

Chinook

1. Analyze the available stock-recruit data for the Alsek, Taku, Unuk, Blossom, and Keta rivers to develop revised escapement goal ranges and production parameters for these stocks.
2. Continue annual mark-recapture projects (Chilkat, Taku, Stikine, Unuk). Conduct periodically on other systems to revise expansion factor and calibrate various survey methods.
3. Initiate periodic surveys for non-indicator stocks (e.g., Wilson, Farragut, Harding, Martin).
4. Continue to collect and analyze age/sex/length and coded-wire tag inspection data annually on all eleven key escapement systems.

Sockeye

1. Continue base escapement enumeration for major sockeye stocks.
2. Continue mark-recapture program for Chilkat River sockeye.
3. Major improvements to the Crescent Lake sockeye escapement enumeration program are needed, because developing enhanced returns of sockeye salmon to Snettisham Hatchery have complicated management of this stock.
4. Repeat mark-recapture program for McDonald Lake.

Coho

1. Fund the Auke Creek Weir.
2. Fund the Chuck Creek Weir.
3. Fund development of an additional full indicator stock in the southern inside area.
4. Fund the Chilkat coho escapement mark-recapture project.
5. Evaluate assumptions of tag loss and mortality in the Taku River mark-recapture estimate using radio-telemetry.
6. Evaluate an expansion factor for the Berners River escapement estimate.
7. Conduct aging validation studies where feasible for additional long-term indicator stocks (Ford Arm Lake and the Taku and Chilkat Rivers).

Chum

1. Continue aerial and foot surveys of chum salmon escapement region wide.

Southeast Region – Goal 2: Stock Assessment

Pink

1. Maintain the existing coverage of surveyed streams and train new observers.

Steelhead

1. Continue Sitkoh Creek project through 2010 (to obtain smolt per spawner estimates for three broods).
2. Identify additional systems for development of adult/smolt abundance and age/sex/length composition time series (seven years minimum per system).
3. Develop expansion factors for snorkel survey index areas.
4. Continue refinement of aging methodologies.

INFORMATION NEED/ACTION 2A-2 Identify the limiting factors for depressed stocks.

Chinook

1. Extend the adult Chickamin River Chinook escapement assessment for age/sex/length and coded-wire tag recovery data.
2. Ensure that the Chilkat and Taku River coded-wire tag projects extend beyond 2008.
3. Determine the present levels of exploitation for the Chilkat River.

Sockeye

1. Continue genetic stock identification of commercial fisheries to assess catch of McDonald Lake sockeye.
2. Evaluate effects of hatchery outplant enhancement of depressed sockeye runs, including assessment of abundance and biological characteristics of wild and hatchery smolts and adults.

Coho – None

Chum

1. Conduct a study of Taku River chum salmon to determine present and historical spawning distribution through radio telemetry, habitat utilization in the nearshore early marine environment, and examination of available Taku River hydrological data.
2. Continue the Disappearance Creek weir project.

Pink – None

Steelhead – See projects listed under 2A-1.

INFORMATION NEED/ACTION 2A-3 Collect and evaluate data regarding harvest by stock by brood year, for hatchery and wild stocks.

Chinook

1. Continue wild stock coded-wire tagging programs for Chilkat, Taku, Stikine, Chickamin, and Unuk rivers Chinook salmon.

Southeast Region – Goal 2: Stock Assessment

2. Continue the genetic stock identification program for Southeast Alaska Chinook salmon fisheries for the troll, sport, and District 108 and 111 gillnet fisheries.
3. Continue operation and funding of the ADF&G Mark, Tag, and Age Lab.
4. Initiate a data standard project for the minimum level of coded-wire tagging for releases of Alaska hatchery Chinook salmon.

Sockeye

1. Continue Northern Boundary stock identification program to meet Pacific Salmon Treaty obligations until the Northern Fund can support it.
2. Continue the stock identification program for the District 11 gillnet fishery to estimate hatchery and wild contributions and satisfy Pacific Salmon Treaty harvest sharing obligations.
3. Continue to develop cost effective genetic stock identification methods that can be routinely applied in Southeast Alaska fisheries.

Coho

1. Fund smolt enumeration and coded-wire tagging at Auke Creek.
2. Fund smolt enumeration and coded-wire tagging at Chuck Creek.
3. Fund coded-wire tagging of smolts in the Chilkat River.
4. Fund coded-wire tagging of smolts on an additional indicator stock in the southern inside areas.

Chum

1. Adequately fund the sampling and processing of otoliths from Southeast Alaska fisheries.

Pink – None

Steelhead

1. Examine the feasibility of using genetic techniques to identify and separate steelhead stocks.

INFORMATION NEED/ACTION 2A-4 Develop data analyses, databases, or models for establishing escapement goals or for fishery management needs.

Chinook

1. Revise escapement goals for the Alek, Taku, Unuk, Blossom, and Keta Chinook stocks using the improved stock-recruit databases available from stock assessment projects conducted over the past decade or more.

Sockeye

1. Use existing methods or, where needed, develop alternative methods and/or models for setting escapement goals.

Coho

1. Develop a biological goal for the Taku River spawning escapement above Canyon Island.

Southeast Region – Goal 2: Stock Assessment

2. Update escapement goals for Ford Arm Lake and the Berners River.

Chum

1. Use traditional methods or develop and evaluate alternative models for estimating sustainable escapement goals for Southeast Alaska chum indicator stocks or stock groups.
2. Compile a chum salmon escapement by stock group database.

Pink

1. Update stock recruitment databases and models for pink salmon.
2. Abandon the observer calibration procedures for escapement index counts, they do not increase accuracy and impose difficulties in maintaining data for in-season management.

Steelhead

1. See projects listed for 2A-1.
2. Identify additional systems and map/quantify usable area.
3. Explore use of habitat-based escapement goals.

INFORMATION NEED/ACTION **2A-5** Develop, evaluate, and implement methods to estimate escapement, including: evaluating existing escapement estimates and developing cost effective technologies to estimate a larger proportion of total escapements.

Chinook

1. Explore the use of DNA based ratio expansion methodologies for estimating escapements.

Sockeye

1. Develop escapement enumeration program for Crescent River sockeye salmon.

Steelhead

1. Develop alternative, cost-effective methods to estimate steelhead escapement (e.g., video, Didson sonar).

Coho, Chum, and Pink – None

INFORMATION NEED/ACTION **2A-6** Estimate freshwater smolt production and/or marine survival for key stocks of interest.

Chinook

1. Fund and implement the work on the five wild stocks: Chilkat, Taku, Stikine, Unuk, and Chickamin rivers.

Coho – See projects recommended for 2A-3.

Steelhead – See projects recommended for 2A-1.

Southeast Region – Goal 2: Stock Assessment

Sockeye, Chum, and Pink – None

Objective 2B: Develop stock specific methods to assess stock status, to apply in management systems to achieve escapement goals.

INFORMATION NEED/ACTION 2B-1 Determine genetic baselines for management, conservation, and restoration efforts.

Chinook and Sockeye

1. Develop methods to delineate stock groups needed for management.

Coho

1. Develop genetic stock identification for coho.

Steelhead – See projects listed under 2A-3.

Chum and Pink – None

Objective 2E: Assess the effect of hatchery production, including supplementation and domestication, on wild salmon stocks.

INFORMATION NEED/ACTION 2E-1 Quantify straying rates.

Chinook

1. Fund annual sampling of biological data, including sampling for coded-wire tags, in the eleven wild escapement indicator stocks.

Chum

1. Ensure adequate sampling of chum salmon indicator stocks.

Steelhead

1. Continue to collect genetic samples from steelhead as opportunities allow (e.g., Sitkoh Creek).
2. Work with state geneticists to develop collection procedures.
3. Analyze existing samples.

Sockeye, Coho, and Pink – None

INFORMATION NEED/ACTION 2E-2 Develop methods to determine acceptable straying rates.

All Species

1. Determine the fitness and productivity effects on wild populations of alternative enhancement practices in specific areas, locations or programs.

INFORMATION NEED/ACTION 2E-3 Assess ecological impacts of large-scale enhancement, including domestication, on wild stocks.

Southeast Region – Goal 2: Stock Assessment

Chinook – See projects recommended under 3A-11.

Sockeye

1. Support continuation of feasibility work on parentage analysis in 2009
2. Determine enhancement strategy (fry, fed-fry, fingerling) to be utilized for testing effects of supplementation.
3. Evaluate effects of hatchery outplant enhancement of sockeye runs, including assessment of abundance and biological characteristics of wild and hatchery smolts and adults.

Coho

1. Evaluate predation by coho salmon on other salmon species.

Steelhead – See project recommended under 2A-3.

Chum and Pink – none

Southeast Region – Goal 3: Salmon Management

AKSSF Framework for Southeast Region – GOAL 3

The interagency group that considered AKSSF Goals 2 & 3 in Southeast Alaska is recommending the following Framework of objectives and information needs/actions for Goal 3: Salmon and Steelhead Management for 2009. The information needs/actions identified as the highest priorities to include in the 2009 Call for Proposals are shaded.

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For the high priority information needs/actions that would be included in the 2009 Call for Proposals, more specific recommendations for the types of approaches/projects that are needed to address the information need/action are provided (following the Framework table).

GOAL 3 – SALMON AND STEELHEAD MANAGEMENT SYSTEMS	
Maintain effective <u>and</u> biologically sound salmon <u>and</u> steelhead management systems to regulate human activities that affect salmon and steelhead.	
Objective	Information Needs/Actions
3A. Develop and implement management systems for wild and enhanced fish production to achieve cultural, social, and economic objectives within acceptable biological limits.	(3A-1) Incorporate <u>stock assessment and fishery information estimates of harvest of wild salmon, and information on the biology of wild salmon, from a drainage or set of drainages</u> to meet allocation and management objectives.
	(3A-2) Conduct <u>Collect</u> ethno-historic and ethnographic research describing eustomary and traditional patterns of <u>subsistence</u> use of wild salmon <u>and steelhead, and investigate changes in those patterns of use through time. from a particular drainage or set of drainages.</u>
	(3A-3) <u>Collect and analyze sufficient</u> information to forecast and manage in-season to achieve management objectives.
	(3A-4) Evaluate the effects of management actions on <u>cultural, social, and/or economic benefits.</u> socioeconomic needs, preferences, or goals.
	(3A-5) Identify user preferences.
	(3A-6) <u>Collect sufficient</u> information on by-catch.
	(3A-7) Respond effectively to changes in annual run strength.
	(3A-8) Develop, evaluate, and update fishery management plans, including regulatory plans, hatchery management plans, and other plans and regulations affecting wild salmon stocks. Ensure that commercial, recreational, and eustomary and traditional <u>subsistence</u> uses of salmon are addressed.

Southeast Region – Goal 3: Salmon Management

Objective 3A - Continued	
Objective	Information Needs/Actions
	<p>(3A-9) Contribute to the development and updates of <u>Develop Phase III Regional Comprehensive Salmon Enhancement Plans for Northern and Southern Southeast Alaska.</u></p> <p>(3A-10) Determine necessary level of enhancement for commercial, recreational and customary and traditional uses of salmon.</p> <p>ADD (3A-11) <u>Evaluate hatchery marine survivals and production strategies and determine effective production and harvest strategies.</u></p>
3B. Minimize adverse impacts to wild stocks from enhancement.	<p>(3B-1) Develop release strategies that minimize the extent to which enhanced fish compete with and prey on wild salmon.</p> <p>(3B-2) <u>Implement plans to control and minimize stray rates.</u> Control genetic introgression to acceptable rate.</p> <p>(3B-3) Ensure enhanced production is adequately marked.</p> <p>(3B-4) Provide an adequate recovery and analysis program.</p> <p>(3B-5) Improve accounting of returns to terminal harvest areas to estimate total run size.</p> <p>(3B-6) Develop management tools to effectively harvest enhanced fish.</p> <p>ADD (3B-7) <u>Determine the effects of hatchery straying on escapement indicator stock surveys.</u></p>
3C. Develop management tools to meet <u>the Annexes of the Pacific Salmon Treaty, revised for 2009-2018.</u> June 1999 Pacific Salmon Treaty agreements.	<p>(3C-1) Develop stock assessment programs to implement abundance-based management and allocation of Chinook, sockeye, and coho stocks between Alaska and Canada on the Taku, Stikine, and Alsek transboundary rivers.</p> <p>(3C-2) Develop more comprehensive stock assessment projects and analysis to meet allocations for sockeye, pink, coho, and chum salmon in the Northern Boundary Area (southern Southeast Alaska and northern British Columbia).</p> <p>(3C-3) Fill significant data gaps to implement several obligations required of Alaska regarding the Chinook chapter in the <u>current 1999</u> Pacific Salmon Treaty Agreement, such as escapement, wild-stock coded-wire tagging, incidental mortality, and stock contribution (genetic and coded-wire tag) estimation programs.</p> <p>(3C-4) Meet mitigation obligations for Alaska specified in the <u>current 1999</u> Pacific Salmon Treaty Agreement.</p>
3D. Restore <u>self-sustaining wild salmon and steelhead stocks, where appropriate.</u> depressed stocks where applicable.	<p>(3D-1) <u>For wild salmon and steelhead stocks that are below historic levels, determine if there are limiting factors, and take action to restore the population, where appropriate.</u> Restore sockeye salmon stocks where needed.</p> <p>(3D-2) Restore chum salmon stocks where needed.</p> <p>(3D-3) Restore chinook salmon stocks where needed.</p> <p>(3D-4) Restore coho salmon stocks where needed.</p> <p>(3D-5) Restore pink salmon stocks where needed.</p>

Southeast Region – Goal 3: Salmon Management

Goal 3 – Recommendations to Focus the Call for Proposals

The following approaches/projects are recommended to address the high priority information needs/actions highlighted above. These approaches/projects were identified through a gap analysis process. However, responses to the 2009 Call for Proposals need not be limited to the approaches/projects listed below. Proposals for other approaches/projects that would implement high priority information needs/actions are also encouraged.

Objective 3A: Develop and implement management systems for wild and enhanced fish production to achieve cultural, social, and economic objectives within acceptable biological limits.

INFORMATION NEED/ACTION 3A-2 Conduct ethno-historic and ethnographic research describing patterns of subsistence use of wild salmon and steelhead, and investigate changes in those patterns of use through time.

All Species:

1. Conduct ethnographic research describing customary and traditional patterns of use of wild salmon from a particular drainage or set of drainages.
2. Conduct subsistence salmon harvest surveys in selected Southeast communities.

INFORMATION NEED/ACTION 3A-3 Collect and analyze information to forecast and manage in-season to achieve management objectives.

Chinook

1. Support Pacific Salmon Treaty Chinook model improvement effort.
2. Explore the potential for inseason abundance estimation for the Southeast Alaska fishery

Chum

1. Conduct feasibility study to improve preseason forecasting for chum salmon, hatchery and wild.

Pink

1. Maintain existing coverage of surveyed streams and train new observers.
2. Maintain Southeast Alaska Coastal Monitoring (SECM) sampling for juvenile pink salmon and associated environmental conditions.

Sockeye, Coho, and Steelhead – None

INFORMATION NEED/ACTION 3A-11 Evaluate hatchery marine survivals and production strategies and determine effective production and harvest strategies.

All Species

1. Continue research contrasting segregated hatchery brood lines with additional wild donor stock genetic input.
2. Continue the evaluation of age-0 smolt production strategies.

Southeast Region – Goal 3: Salmon Management

3. Establish a data standard for the minimum level of coded-wire-tagging for releases of Alaska hatchery Chinook and coho salmon (see 2A-3).
4. Evaluate the costs and benefits of different release strategies (e.g., parent hatchery vs. off-site release).

Objective 3C: Develop management tools to meet the Annexes of the Pacific Salmon Treaty, revised for 2009-2018.

INFORMATION NEED/ACTION 3C-1 Develop stock assessment programs to implement abundance-based management and allocation of Chinook, sockeye, and coho stocks between Alaska and Canada on the Taku, Stikine, and Alsek transboundary rivers.

Chinook

1. Continue funding annual mark-recapture projects for Chinook salmon on the Taku and Stikine rivers.
2. Continue funding the Stikine and Taku rivers coded-wire tagging projects beyond 2008.
3. Continue funding for the Chinook salmon genetic stock identification program for Districts 108 and 111.
4. Fund analysis of samples collected from the Taku and Stikine rivers to develop additional separation of these two stocks in mixture samples from fisheries.
5. Examine feasibility of using GSI techniques to estimate in-river abundance of Klukshu River Chinook salmon in the Alsek River.

Sockeye

1. Continue the Taku and Stikine rivers sockeye salmon mark-recapture projects (Alaska's share) beyond 2008.
2. Continue the District 111 sockeye salmon stock identification program. Examine the feasibility of using GSI techniques to replace scale pattern analysis methods.
3. Examine the feasibility of using GSI techniques to estimate in-river abundance of Klukshu River sockeye salmon in the Alsek River.

Coho

1. Continue the Taku River coho salmon mark-recapture project beyond 2008.
2. Develop a biological escapement goal for Taku River coho salmon migrating above Canyon Island.

INFORMATION NEED/ACTION 3C-2 Develop more comprehensive stock assessment projects and analysis to meet allocation for sockeye, pink, coho, and chum salmon in the Northern Boundary Area (southern Southeast Alaska and northern British Columbia).

Sockeye

1. Continue the new northern Boundary Area sockeye stock identification project beyond 2008.

Southeast Region – Goal 3: Salmon Management

INFORMATION NEED/ACTION **3C-3** Fill significant data gaps to implement several obligations required of Alaska regarding the Chinook chapter in the current Pacific Salmon Treaty Agreement, such as escapement, wild-stock coded-wire tagging, incidental mortality, and stock contribution (genetic and coded wire tag) estimation programs.

Chinook

1. Continue funding annual escapement estimation and biological sampling projects for Chinook salmon in Southeast Alaska on all eleven indicator systems.
2. Continue funding the coded-wire tag projects on five wild systems beyond 2008.
3. Continue funding for the genetic stock identification program for fisheries in Southeast Alaska that harvest Chinook salmon and provide finer stratification of stock composition by time and area.
4. Develop a plan for improving the Pacific Salmon Commission Chinook Model.
5. Fund model improvements for the Pacific Salmon Commission Chinook Model.
6. Develop and fund estimation and prediction of incidental mortality of Chinook salmon in fisheries in Southeast Alaska.
7. Maintain expertise of Alaska members of the Chinook Technical Committee.

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2008 Science Panel Proposal Categories – Southeast Alaska

Priority Information Needs/Issues

Goal 1: Habitat

Protect and restore freshwater, estuarine and marine salmon habitats to maintain resource productivity.

Objective	Information Need/Issues
1-A. Identify, protect and manage spawning, incubation, rearing and migration habitats to mitigate or prevent anthropogenic perturbations beyond the bounds of natural variation.	(1A-2) Quantify flow requirements for life stages of salmon and reserve sufficient amounts of water.
	(1A-3) Develop information syntheses (summaries of analyzed information) and management sharing systems to provide managers and public readily available information on salmon habitat and existing and future land and water uses.
	(1A-5) Identify location of critical/essential spawning, incubation, rearing and migration habitat, including site-specific habitat characteristics (e.g., vegetation, substrate, hydrology).
	(1A-6) Establish baselines for water quality and quantity for selected systems.
	(1A-7) Analyze cumulative effects of human activity across spatial and temporal scales for watershed management on important salmon producing systems.
	(1A-9) Identify data that may be useful but has not been analyzed.
	(1A-10) Understand linkages between amount and quality of habitat and salmon productivity.

Objective	Information Need/Issues
1-B. Detect and predict annual and long-term anthropogenic and natural changes and trends in salmon habitat.	(1B-7) Monitor long-term trends of smolt production.
	(1B-8) Understand freshwater conditions that affect salmon survival.
	(1B-9) Understand estuarine conditions that affect salmon survival.

2008 Science Panel Proposal Categories – Southeast Alaska

Priority Information Needs/Issues

Goal 2: Salmon Stock Assessment

Collect information needed to sustain high potential productivity of wild salmon stocks.

Objective	Information Need/Issues
2A. Estimate and periodically evaluate escapement goal approach and the biological goal ranges to achieve sustained yield.	(2A-1) Obtain reliable estimate of escapement by age/sex/length.
	(2A-2) Identify the limiting factors for depressed stocks.
	(2A-3) Collect data regarding harvest by stock by brood year for hatchery and wild stocks.
	(2A-4) Develop data analyses, databases, or models for biological escapement goals.
	(2A-5) Develop, evaluate, and implement methods to estimate escapement, including: developing cost effective technologies, evaluating existing escapement estimates, and developing technologies to estimate a larger proportion of total escapements without increasing cost.

Objective	Information Need/Issues
2E. Assess the effect of hatchery production, including supplementation and domestication, on wild salmon stocks.	(2E-3) Assess ecological impacts of large-scale enhancement, including domestication, on wild stocks.

2008 Science Panel Proposal Categories – Southeast Alaska

Priority Information Needs/Issues

Goal 3: Salmon Management Systems

Maintain effective, biologically sound, salmon management systems to regulate human activities that affect salmon.

Objective	Information Need/Issues
3A. Develop and implement management system for wild and enhanced fish production to achieve cultural, social, and economic objectives within acceptable biological limits.	(3A-1) Incorporate estimates of harvest of wild salmon and information on the biology of wild salmon, from a drainage or set of drainages to meet allocation and management objectives.
	(3A-2) Collect ethno-historic and ethnographic research describing customary and traditional patterns of use of wild salmon from a particular drainage or set of drainages.
	(3A-3) Collect sufficient information to forecast and manage in-season to achieve management objectives.
	(3A-4) Evaluate the effects of management actions on socioeconomic needs, preferences, or goals.
	(3A-5) Identify user preferences.
	(3A-6) Collect sufficient information on by-catch.
	(3A-7) Respond effectively to changes in annual run strength.
	(3A-8) Develop, evaluate, and update fishery management plans, including regulatory plans, hatchery management plans, and other plans and regulations affecting wild salmon stocks. Ensure that commercial, recreational, and customary and traditional uses of salmon are addressed.
	(3A-10) Determine necessary level of enhancement for commercial, recreational, and customary and traditional uses of salmon.
	3C. Develop management tools to meet June 1999 Pacific Salmon Treaty agreements.
(3C-2) Develop more comprehensive stock assessment projects and analysis to meet allocations for sockeye, pink, coho, and chum salmon in the Northern Boundary Area (southern Southeast Alaska and northern British Columbia).	
(3C-3) Fill significant data gaps to implement several obligations required of Alaska regarding the Chinook chapter in the 1999 PST Agreement, such as escapement, wild-stock CWT, incidental mortality, and stock contribution (genetic and coded wire tag) estimation programs.	
(3C-4) Meet mitigation obligations for Alaska specified in the 1999 PST.	