Strategic Plan for the Subsistence Fisheries Resource Monitoring Program, Southcentral Region, 2004

Developed by the

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March 2005

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PREFACE

A strategic planning process was initiated for the Southcentral region in 2004 to ensure that the Fisheries Resource Monitoring Program (Monitoring Program) focuses on the highest priority information needs for management of Federal subsistence fisheries over the next 3-5 years. The strategic planning participants comprised a workgroup that included regional professionals and representatives of the Southcentral Regional Advisory Council. Areas within Southcentral Alaska under consideration during this planning effort included the Copper River drainage and Prince William Sound. Information needs for Cook Inlet were not considered as part of the planning process, pending regulatory development of subsistence fisheries in that area by the Federal Subsistence Board (Board).

Strategic planning occurred in three phases:

1. the development of a framework of goals, objectives and information needs by subsistence fishery unit, and prioritization of information needs,
2. regional council and public review and comment of strategic priorities, and
3. a project inventory and gap analysis.

Elements of the framework were considered in the context of enabling legislation, Section 812 of the Alaska National Interest Land Conservation Act (ANILCA), and also guidelines approved by the Board, which acknowledge that other agencies take the lead in certain areas of study. Accordingly, the workgroup considered, but did not specifically include, information needs that had little relevance to management of subsistence fisheries on or associated with Federal public lands. In addition, information on artificial propagation and enhancement of salmon, contaminant evaluation and monitoring, or habitat protection, restoration and enhancement were not included in the framework. The need to explore alternative management strategies and paradigms was considered crucial by the workgroup; thus, this concept was raised from the regional framework to consideration of funding on a statewide scale. The extent of geographic area and number of fishery units was a challenging undertaking in the time allotted, and further strategic planning remains to be done. Nonetheless the workgroup completed strategic planning for the subsistence fisheries that were considered the highest priority for informational needs, as well as a framework to complete strategic planning for all remaining subsistence fisheries in this region. The workgroup considered this product sufficient to guide strategic priorities over the next 3-5 years.

INTRODUCTION

BACKGROUND

On October 1, 1999, under the authority of Title VIII of ANILCA[1], the Federal government assumed management responsibility for subsistence fisheries on Federal public lands in Alaska

[1] www.r7.fws.gov/asm/anilca/title08.html

(Buklis 2002). Expanded subsistence fisheries management has imposed substantive new informational needs for the Federal system (Krueger *et. al* 1999).

Section 812 of ANILCA directs the Departments of Interior and Agriculture, cooperating with the State of Alaska and other Federal agencies, to research fish and wildlife subsistence uses on Federal public lands. The challenge posed by dual management of fisheries, coupled with the informational and communication demands of real-time fisheries management, prompted creation of the Monitoring Program within the Office of Subsistence Management (OSM). The Monitoring Program was envisioned as a collaborative inter-agency, inter-disciplinary approach to enhance existing fisheries research, and effectively communicate information needed for subsistence fisheries management on Federal public lands.

The mission of the Monitoring Program is to identify and provide information needed to sustain subsistence fisheries on Federal public lands, for rural Alaskans, through a multidisciplinary, collaborative program.

RATIONALE FOR STRATEGIC PLANNING

Since its inception in 2000, over 200 monitoring and research projects have been funded through the Monitoring Program to support Federal subsistence fisheries management. To date, strategic priorities for the Monitoring Program have been identified through the Regional Advisory Councils (Councils) as issues and information needs (OSM 2004). These issues and information needs have been used to guide solicitation and evaluation of project proposals. While this process has provided a valuable public forum for a wide range of staff and public to provide recommendations regarding informational needs for the Monitoring Program, it has often been difficult to determine the highest priority information needs for the Federal subsistence management program.

To ensure strategic use of limited Monitoring Program funds, beginning in Spring 2004 OSM initiated a more rigorous strategic planning process to identify and prioritize program goals, research objectives and information needs by region (Appendix A). To identify key information needed to better manage Federal subsistence fisheries, Fisheries Information Services (FIS) staff, will eventually undertake a planning process for each region. Participants in the process will include managers, fisheries professionals, and Council members. The strategic planning process was first applied in 2004 to the Copper River and Prince William Sound areas of the Southcentral Region. Workshop participants were solicited from organizations appropriate to each region including Federal agencies, the Alaska Department of Fish and Game (ADFG), academia, and Alaska Native, rural, and other organizations. Council representation was also invited to effectively transition from issues and information needs already developed through the Councils, as well as to provide valuable local perspective.

Prioritized program goals, research objectives and information needs developed through these workshops underwent public review through the Council. Following this review, workshop participants re-convened a second time to address review comments, inventory all past and current projects that address each identified information need, and assess which information needs are of importance to address in the subsequent annual Monitoring Plan.

The purpose of this report is to describe and present the strategic plan developed through the Southcentral workshop process.

APPLICATION OF STRATEGIC PLANNING

The strategic plan will be used to: (1) clarify future requests for proposals; and (2) define the evaluation criterion for strategic priorities. Clarification of strategic priorities of the Monitoring Program should improve the quality and focus of proposals. Some clarity has already been provided to the mission of the Monitoring Program through establishment of policy approved by the Board (see below). For instance, identified information needs should not be in conflict with activities ineligible for funding. The 3-year limitation for funding commitments provides a realistic planning horizon.

Strategic plans should also improve focus for the evaluation process, for instance by addressing existing policy sideboards. The current evaluation processes, including evaluation criteria (technical merit, administrative expertise, and capacity building described below), will remain in place. However, the role of guidelines by data type will likely diminish as the Monitoring Program evolves to address high priority information needs. That is, the strategic planning process focuses on high priority issues and information needs; these can best be addressed using both data types, so the need for explicit guidelines by data types may diminish over time.

A summary of the existing proposal evaluation process, policy guidance, and funding guidelines established for the Monitoring Program follows.

Project Evaluation Process

The Monitoring Program is implemented though a collaborative approach involving five Federal agencies (Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and USDA Forest Service), the ADFG, Councils, Alaska Native organizations, and other organizations. An inter-agency Technical Review Committee (TRC) provides evaluation and technical oversight of proposals. Public review and recommendations for funding are provided through the Councils. An inter-agency Staff Committee reviews all recommendations, and attempts to reconcile any differences between staff and public recommendations. The Board approves annual monitoring plans with the benefit of both a technical recommendation by the TRC and public review by the Councils.

The TRC screens project proposals, forwards a subset of these proposals for development of detailed project investigation plans, and subsequently evaluates these investigation plans to make recommendations for funding. The TRC is composed of representatives from each of the five Federal agencies, three representatives from ADFG, and is chaired by the Chief of FIS. Staff from FIS provides support for the TRC.

Evaluation and recommendations for funding are based upon four evaluation criteria:

1. Strategic Priorities

   To be considered for funding under the Monitoring Program, there must be, at a minimum, a Federal *nexus*, or interest. Proposed studies must have a direct association to a subsistence fishery, and either the subsistence fishery or fish stocks in question must occur in waters

within or adjacent to Federal public lands. Studies that can establish a Federal *nexus* are then further evaluated for strategic importance within the region in question by assessing:

- Conservation Mandate – Risk to the conservation of species and populations that support subsistence fisheries and risk to conservation unit purposes.
- Allocation Priority – Risk of failure to provide a priority to subsistence uses and risk that subsistence harvest needs will not be met.
- Data Gaps – Amount of information available to support subsistence management. A higher priority is given where a lack of information exists.
- Role of Resource – Importance of a species to a subsistence harvest (e.g. number of subsistence users affected, quantity of subsistence harvest), and qualitative significance (e.g. cultural value, unique seasonal role).
- Local Concern – Level of user concern over subsistence harvests (e.g. allocation, competing uses, changes in fish size)

2. Technical-Scientific Merit

Technical quality of the study design must meet accepted standards for information collection, compilation, analysis, and reporting. Studies must have clear objectives, appropriate sampling design, correct analytical procedures, and specified progress and final reports.

3. Past Performance-Administrative Expertise

Investigators and their organizations must have demonstrated technical and administrative expertise to complete prior studies, or have co-investigators or appropriate partnerships with other organizations to meet all requirements of the study. Studies must be non-duplicative with previously funded or existing projects.

4. Partnership-Capacity Building

Studies must include appropriate partners and contribute to the capacities of rural organizations, local communities, and residents to participate in fisheries resource management. Investigators must have completed appropriate consultation about their study with local villages and communities in the area where the study is to be conducted. Investigators and their organizations should be able to demonstrate the ability to maintain effective local relationships and a commitment to capacity building.

Policy and Funding Guidelines

In addition to the above evaluation criteria used by the TRC, several other policies also affect consideration of projects:

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- A minimum of 60% of the Monitoring Program funding is dedicated to non-Federal sources.
- Activities not eligible for funding under the Monitoring Program include: a) habitat protection, restoration, and enhancement; b) hatchery propagation, restoration, enhancement, and supplementation; and c) contaminant assessment, evaluation, and monitoring. The rationale behind this policy guideline is to ensure that existing responsibilities and effort by government agencies were not duplicated under the

Monitoring Program. Land management government agencies already have direct responsibility, as well as applied programs, to address these activities. Examples of activities not eligible for funding include: enforcement of habitat protection regulations; restoration or mitigation of altered habitat; stocking; enhancement of spawning or rearing habitats; or heavy metal contaminant sampling. The Monitoring Program can fund research to determine factors that affect subsistence fisheries or fishery resources. For example, the Monitoring Program can legitimately fund projects that assess the proportions or contributions of hatchery fish, or measures of freshwater rearing capacity; however, it would be inappropriate to fund projects to solely assess or make recommendations on stocking levels. Similarly, the Monitoring Program can legitimately fund projects that assess whether migratory barriers (e.g. falls, beaver dams) significantly affect spawning success or distribution; however, it would be inappropriate to fund projects to build fish passes or otherwise alter or enhance habitat.

- Projects may be funded for up to three years duration.

The Monitoring Program was first implemented in 2000, with an initial investment of $5 million. Since 2001, a total of $6.25 million is annually allocated for the Monitoring Program. The Department of Interior, through the U.S. Fish and Wildlife Service, annually provides $4.25 million. The Department of Agriculture, through the U.S. Forest Service, annually provides $2 million. On an annual basis, this budget funds both continuations of existing studies (year-2 or 3 of multi-year projects), and new study starts. Budget guidelines were established by geographic region and data type (Table 1). Proposals are solicited according to the following two data types.

1. Stock Status and Trends Studies.
   These projects address abundance, composition, timing, behavior, or status of fish populations that sustain subsistence fisheries with nexus to Federal public lands. The budget guideline for this category is two-thirds of available funding.

2. Harvest Monitoring and Traditional Ecological Knowledge Studies.
   These projects address assessment of subsistence fisheries, with nexus to federal public lands, including quantification of harvest and effort, and description and assessment of fishing and use patterns. The budget guideline for this category is one-third of available funding.

Table 1. Current guidelines for funding by region for the Fisheries Resource Monitoring Program. In this example, these guidelines are applied to the $6.25 million annual allocation for projects.

	Values in $000's					
	Dept of the Interior		Dept of Agriculture		Total	
Region	%	$	%	$	%	$
Arctic/Kotzebue/Norton Sound	17.0%	$722			11.6%	$722
Yukon River	29.0%	$1,233			19.7%	$1,233
Kuskokwim River	29.0%	$1,233			19.7%	$1,233
Bristol Bay/AkPeninsula/Kodiak	15.0%	$638			10.2%	$638
Southcentral Alaska	5.0%	$212	32.5%	$650	13.8%	$862
Southeast Alaska	0.0%	$0	62.5%	$1,250	20.0%	$1,250
Inter-regional	5.0%	$212	5.0%	$100	5.0%	$312
TOTALS	100.0%	$4,250	100.0%	$2,000	100.0%	$6,250

SOUTHCENTRAL REGION

Geographic Scope

The Monitoring Program is administered by geographic regions, one of which is the Southcentral Region. The region includes Cook Inlet, Prince William Sound, and the Copper River basin. The status of subsistence fisheries regulations on Federal public lands in Cook Inlet is under review by the Board, and identification of further information needs would be premature at this time. In accordance with policy on this matter, information needs for Cook Inlet were not considered.

Federal public lands within Prince William Sound and the Copper River basin are extensive (Figure 1). The major features that define the Federal *nexus* for these areas include: the Chugach National Forest in Prince William Sound and the Copper River delta; the Wrangell-St. Elias National Park and Preserve in the Copper River basin, and the Gulkana River Wild and Scenic River in the Copper River basin.

Subsistence Fishery Units

Subsistence fishery units describe the major functional units for management and regulation of subsistence fisheries with *nexus* to Federal public lands; and are defined by geography, species, and subsistence fishery users. For each fishery unit, species are identified that are addressed for strategic planning at this time. Subsistence fishery units identified in the Southcentral region are:

- Copper River Salmon Fishery Unit
  Sockeye, Chinook, coho salmon
- Copper River Rainbow/Steelhead Fishery Unit
- Copper River Freshwater Species Fishery Unit
  Burbot, lake trout, Arctic grayling, whitefish, Dolly Varden
- Copper River Eulachon Fishery Unit
- Prince William Sound/Copper River Delta Salmon Fishery Unit
  Sockeye, coho, chum, pink
- Prince William Sound/Copper River Delta Freshwater Species Fishery Unit
  Cutthroat trout, Dolly Varden, whitefish

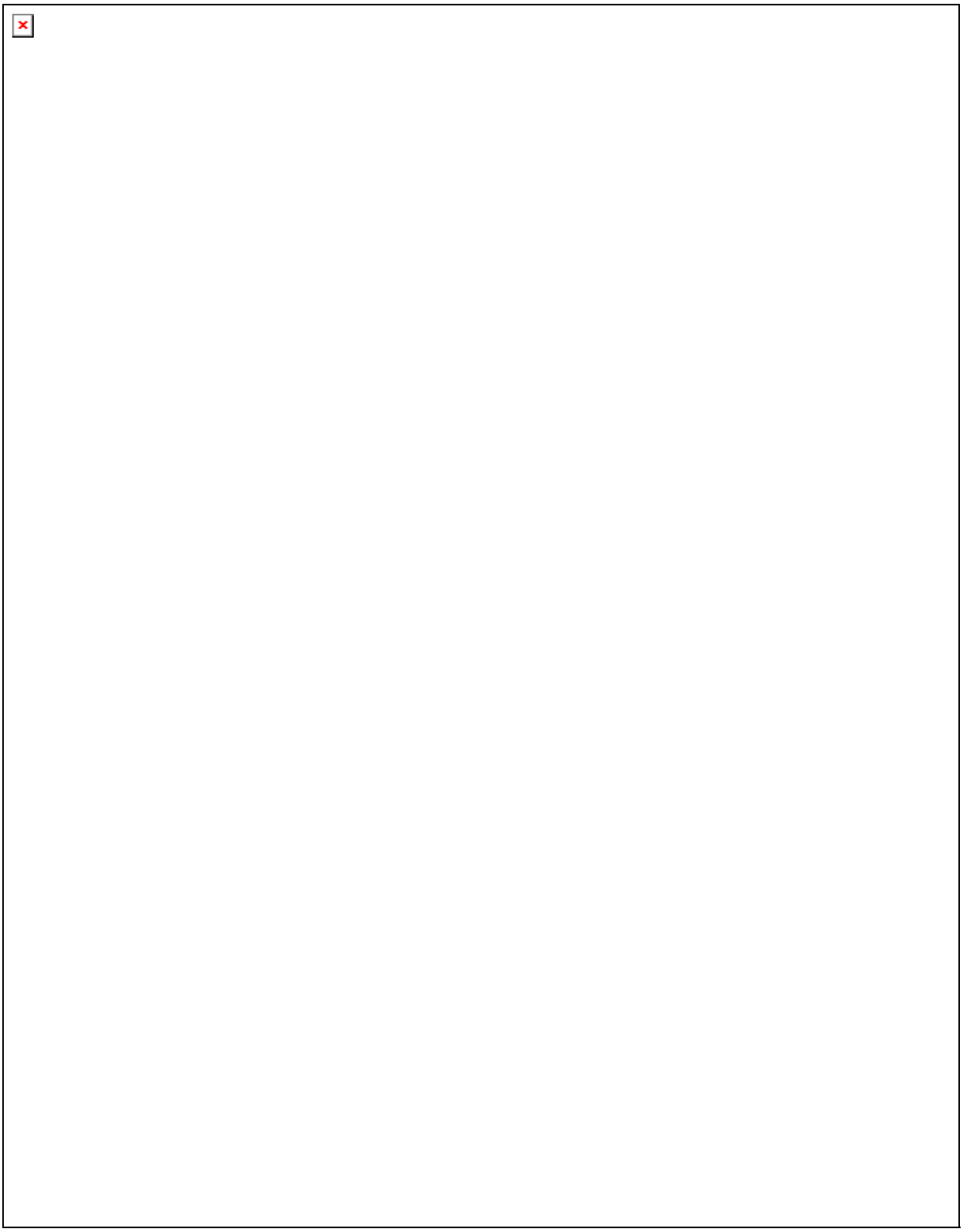


Figure 1. Federal public lands within Prince William Sound and the Copper River basin.

THE STRATEGIC PLAN AND PROCESS OVERVIEW

The strategic plan consists of three products:

(1) a framework of prioritized goals, objectives and information needs for Federal subsistence fishery management within the region, including a Glossary of terms (Appendix B);
(2) an inventory of projects, past and present, that provide relevant information for each identified information need; and,
(3) recommendations for actions that should be considered under the Monitoring Program for each information need – referred to hereafter as the *gap analysis*.

These products are used to define strategic priorities for the Monitoring Program. Strategic priorities are: high priority information needs - identified in (1) above; that are either ongoing, or insufficiently addressed in the current program – see (2) above; for which specific recommendations have been identified – see (3) above.

Strategic planning occurred in three phases (Table 2). The first phase occurred on April 20-22, 2004, when participants met in Anchorage to structure the problem and prioritize information needs. The results of this workshop were drafted into an interim report that was distributed in June for review and comment. The second phase was Council and public review of this interim report. Review comments were primarily solicited from distribution of the interim report by workshop participants to their agency affiliations, and the Southcentral Council. In September, FIS staff presented the interim report to the Council, and actively solicited review comments. The third phase of the strategic plan occurred November 8-9 2004, when participants again met in Anchorage to address review comments, revisit and finalize structure and prioritized information needs, and conduct the project inventory and gap analysis.

Table 2. Outline of the strategic planning process, Southcentral Region.

Phase	Time frame	Activity
One	April 20-22, 2004	Workgroup meeting in Anchorage to structure the problem by Fishery Unit and prioritize information needs
	June, 2004	Interim draft report distributed to workgroup for review and comment
	July, 2004	Workgroup comments incorporated into interim report
Two	September, 2004	FIS staff present interim report to the Council and solicit comments
Three	October, 2004	Workgroup inventories projects by information need
	November 8-9, 2004	Workgroup reconvenes in Anchorage to address review comments, revisit and finalize structure, review project inventory and conduct gap analysis
	February, 2005	Interim draft report distributed to workgroup for review and comment
	March, 2005	Final report published and distributed

PLAN FRAMEWORK AND PRIORITIZATION

METHODS

Participants

Participants were solicited from professionals associated with management and/or research of subsistence fisheries in the Copper River basin and Prince William Sound. The Council was asked to provide up to two participants for this planning effort to effectively transition from the Council's issues and information needs and to provide valuable local input. Approximately 15 other participants were invited to obtain a representative cross section of perspectives from regional professionals of different disciplines, balanced with the logistic considerations concerning group size (Appendix C-1). The meeting was co-chaired by staff from FIS. A professional facilitator and decision analyst, Dr. Margaret Merritt (Resource Decision Support), was hired to provide training in decision-making methodology, guide the discussion, and analyze results.

Planning Approach

A systems approach, the Analytic Hierarchy Process (AHP) was used to structure the problem, or issue to be resolved, and derive the interactions of its parts using expert judgment (Saaty 1999). Expert judgment is defined as "previous relevant experience, supported by rational thought and knowledge" (Saaty and Kearns 1985). The AHP has been used extensively for decades to address planning, conflict resolution, and prioritization in such areas as policy development, economics, engineering, medical and military science, and has more recently been applied to fisheries research and management (NEFC 1990; Merritt and Criddle 1993, Merritt 2000, 2001, 2002). The AHP is a tool for facilitating decision-making by structuring the problem into levels comprising a hierarchy. Breaking a complex problem into levels permits decision makers to focus on smaller sets of decisions, improving their ability to make accurate judgments. Structuring also allows decision makers to think through a problem in a systematic and thorough manner. The AHP encourages people to explicitly state their judgments of preference or importance. Decision support software, Expert Choice,[2] was used interactively to structure the problem, depict the influence of weights, and derive the priority of elements.

Structuring and Establishing Priorities

A top-down structuring approach was used in the planning process, whereby the mission forms the top of the hierarchy and goals form the second level of the hierarchy. OSM staff provided the mission and goals of the Monitoring Program prior to the planning meeting. Workgroup participants identified several objectives for each goal. Objectives are measurable statements of purpose, and as intermediary steps, form the third level of the hierarchy. For each objective, participants then identified information needs. Information needs are specific issues, impediments to overcome, data gaps or uncertainties; and form the bottom level of the hierarchy. To facilitate discussion and the development of information needs within objectives, participants formed small workgroups; their recommendations were then presented to the entire group for further comment and refinement.

[2] Forman, E., T. Saaty, M. Selly, and R. Waldron. Expert Choice, Decision Support Software, McLean VA. 1983.

Structuring of goals, objectives and information needs was first completed for Copper River salmon, and this planning framework was subsequently used as a template from which to launch development of objectives and information needs for the remaining subsistence fishery units. Again, participants formed small workgroups to discuss information needs by subsistence fishery unit, and each presented their recommendations to the entire group for further comment and refinement.

The planning framework for each subsistence fishery unit was completed during the second day of the meeting. Participants then turned their attention towards developing criteria for judging importance. Two sets of criteria were needed:

- to judge importance for information gathering among subsistence fishery units, and
- to judge importance among the goals, objectives and information needs of the Copper River salmon planning framework.

There was considerable discussion about what each criterion represented, which helped to refine understanding among the group. Importance for information gathering among subsistence fishery units was judged according to the degrees to which each fishery unit met the following criteria and their designated values:

Criteria	Value
Whether the fish species in question provides a primary or targeted subsistence resource; or, could potentially become a targeted species in the next 3-5 years	High
The extent of Federal jurisdiction over the fishery (e.g., direct vs indirect)	High
The degree of allocation issues between subsistence and other competing uses of the resource (e.g., fully vs partially allocated)	Medium
The extent to which the fish species or stocks in question are potentially vulnerable to over harvest	Medium

Importance among goals, objectives, and information needs was judged according to the strategic advantage to Federal subsistence management of knowing about:

Criteria	Value
The resource; the extent to which knowledge provides for sustainability of the resource	High
The users; the extent to which knowledge provides information about socioeconomic benefits to rural subsistence users	Mid-high
Uncertainty; the consequence of not having full knowledge	Medium

Using the above criteria as guidelines, the group was asked to use their expert judgment in individually assigning ratings of importance to each level (goals, objectives, or information needs) of the planning framework hierarchy. The relative importance of the goals under

consideration was evaluated, then that of the objectives within each goal, then that of the information needs within each objective. Participants were given time to think and write their ratings of importance down on paper before sharing their judgments. A positive ratio scale with associated verbal equivalents was used to rate importance, where numbers between those listed (e.g., 2, or 2.5, etc.) were used to interpolate meanings as a compromise:

Scale of Importance	Definition
9	Extreme importance
7	Very strong importance
5	Strong importance
3	Moderate importance
1	Slight importance

Elements judged to be of equal importance were given equal scores. Consensus within a range of two to three points on the rating of elements was usually achieved among participants. When disparity in judging importance occurred, it meant there was disagreement, and discussion and debate was encouraged. Debates advanced the understanding of important concepts and often resulted in a clearer definition of the goal, objective or information need. Seeking consensus encouraged dialogue, learning, and formation of a group solution.

Expert Choice was used interactively to depict the influence of weights and derive the priority of information needs. Priorities were derived from the worksgroup's score of each information need, weighted by the workgroup's score of the appropriate objective and goal. Mathematically, relative ratings of importance were entered into a vector and normalized. The values from the vector were multiplied by the weight in the next highest level, and the result is the weight of importance for information needs. The total score for each information need was calculated by adding the weighted proportions over all objectives within a goal:

$$T_m = \sum_{k=1}^{d} W_k p_{k,m}$$

where

T_m = the total weighted score for information need m,
W_k = the weight for objective k,
$p_{k,m}$ = the weighted proportion of the total score for information need m addressing objective k
d = the number of information needs.

Structural Adjust

Structural imbalance in the hierarchy can lead to dilution of the weight of many information needs under a single objective, so an adjustment feature in Expert Choice was used to restore priorities to their respective proportion of weight.

In a conceptual example, consider that if an objective (A) has four information needs, and another objective (B) has two information needs, then there are six information needs in all and

structural adjusting multiplies A's priority by 4/6 and B's by 2/6. Thus, the overall priorities for A's information needs are not diluted simply because there are many of them.

RESULTS AND DISCUSSION

Goals

Staff from FIS recognize four broad goals needed to achieve the mission of the Monitoring Program: (1) assessment of fish populations; (2) assessment of subsistence fisheries; (3) assessment of management actions; and (4) promotion of public support and involvement in fisheries monitoring. After thoughtful discussion, participants carefully worded these goals to ensure that each represented a unique concept, such that there would be little overlap in objectives and information needs:

1. ***Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.***
   Information needed to achieve Goal 1 includes estimates of abundance, composition, timing, and distribution, as well as developing an understanding of critical factors that affect production.

2. ***Assess and monitor subsistence fisheries to document and provide for subsistence uses.***
   Information needed to achieve Goal 2 includes baseline estimates and descriptions of subsistence use patterns including harvest, effort, methods, timing location, and demographics, as well as developing an understanding of critical factors that affect subsistence use patterns.

3. ***Develop and evaluate effective regulatory and management strategies to provide for subsistence uses.***
   Actions to address Goal 3 include collecting information on customary trade to answer specific regulatory questions, evaluation of management strategies, development of effective information sharing systems, and assessment of competing fisheries.

4. ***Promote public support and involvement for fisheries monitoring.***
   Achieving meaningful collaboration in information gathering and assessment requires education and involvement outside of government agencies. Outreach activities include development of training materials and forums, professional staff, and educational opportunities.

The first three goals involve the collection and synthesis of information, and form the basis for the Southcentral strategic plan. The fourth goal concerns public support and involvement, and will undergo its own statewide planning process.

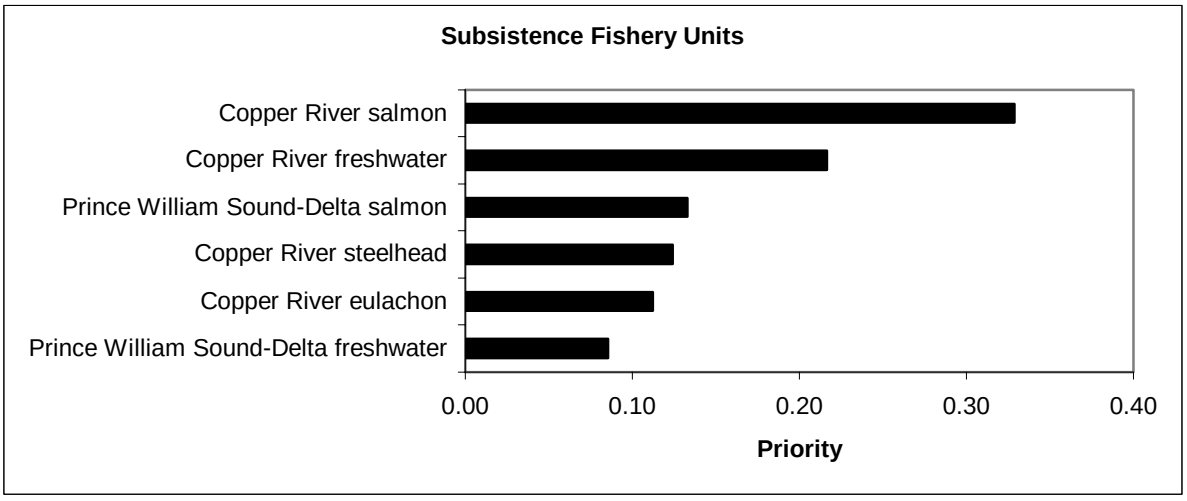
The workgroup struggled with established guidance for data types, funding guidelines and other evaluation criteria (see previous sections on Project Evaluation Process, and Policy and Funding Guidelines) as they pertain to the goals. For example, traditional ecological knowledge (TEK) is

a method that is potentially applicable to all three goals. Because the policy of allocating 2/3 funding to stock status and trends information and 1/3 to harvest monitoring and TEK is not relevant to identifying informational priorities, participants were counseled to focus on identifying and prioritizing information needed to attain the objectives of the strategic plan. Similarly, capacity building is a desired outcome of the conduct of projects and is still maintained as a project evaluation criterion, even though capacity building is not relevant to identifying informational priorities.

Subsistence Fishery Units

The workgroup identified six subsistence fishery units (see previous section on Subsistence Fishery Units, page 6) for informational needs. Most fishery units, particularly those that address salmon, were obvious and quickly adopted by the workgroup. The Copper River freshwater species unit includes Dolly Varden, Arctic grayling, whitefish, burbot, and lake trout. The inclusion of steelhead/rainbow trout into the Copper River salmon unit was discussed, but based on the important distinctions that steelhead are harvested incidentally as opposed to directed effort for the other salmon species, and conservation concerns for this species, steelhead/rainbow trout were separated into their own unit for purposes of identifying and prioritizing information needs. The workgroup recommended the need for a freshwater species unit in Prince William Sound because there is subsistence harvest of whitefish and cutthroat trout for which the Federal manager anticipated some information. Questions regarding the inclusion of Prince William Sound shellfish or halibut into fishery units were dismissed because there is no Federal *nexus* for shellfish, and halibut fall under the jurisdiction of the North Pacific Fishery Management Council.

The workgroup prioritized subsistence fishery units for informational needs:



As can be seen, it was relatively easy for the workgroup to prioritize the highest (Copper River salmon) and lowest (Prince William Sound-Delta freshwater species) fishery units for informational needs for Federal subsistence management. However, there was substantial discussion about the relative priorities of the intermediate fishery units, particularly Prince William Sound-Delta salmon, Copper River rainbow/steelhead, and Copper River eulachon. Although not substantively different in rank importance, the workgroup arrived at the final order

by considering that salmon are the primary subsistence resource of the entire region, rainbow/steelhead are only incidentally harvested to salmon in subsistence fisheries, and eulachon are a minor component of subsistence harvests during a very narrow window of time.

The workgroup also engaged in discussion of the relative importance of informational needs by species within the two highest priority fishery units. Within the Copper River salmon unit, sockeye received the highest rating (0.487), followed by Chinook (0.385) and coho (0.128) salmon. Coho salmon are a very minor component of Copper River salmon subsistence harvests and the workgroup recommended that projects addressing coho salmon assessment not be considered under the Monitoring Program during this 3-5 year planning horizon. Within the Copper River freshwater unit, lake populations of burbot and lake trout were identified as the only species that should be considered for assessment projects under the Monitoring Program during this 3-5 year planning horizon. The workgroup arrived at this conclusion by considering that these are slow growing and long lived species that have a demonstrated history of over-exploitation within the Copper River basin.

Because the workgroup rated Copper River salmon as the most important subsistence fishery unit for information needs, they focused effort on completing its prioritization by the end of the first workshop. Once the subsistence fishery units and goals were established, the workgroup proceeded to develop the framework for the Copper River salmon plan, and to use this framework as building blocks for the remaining five plans, organized by subsistence fishery unit.

Subsistence Fishery Unit: Copper River Salmon

The Framework

A total of 33 elements comprise the planning framework (Figure 2): 3 goals, 7 objectives, and 23 unique information needs. Goal 1 has three objectives, one more than Goals 2 and 3. Discussions relating to Goal 1 generated more objectives because the information necessary to sustain salmon populations is broad and varied, dealing with such topics as escapement goals, estimation of abundance and migratory timing, and factors influencing population dynamics. Because the number of information needs in Goal 1 totals 11, compared to seven and five in Goals 2 and 3, respectively, the Copper River salmon framework was slightly imbalanced. To correct for this imbalance, ratings were adjusted using the structural adjust feature in Expert Choice to restore priorities to their intended proportion of weight.

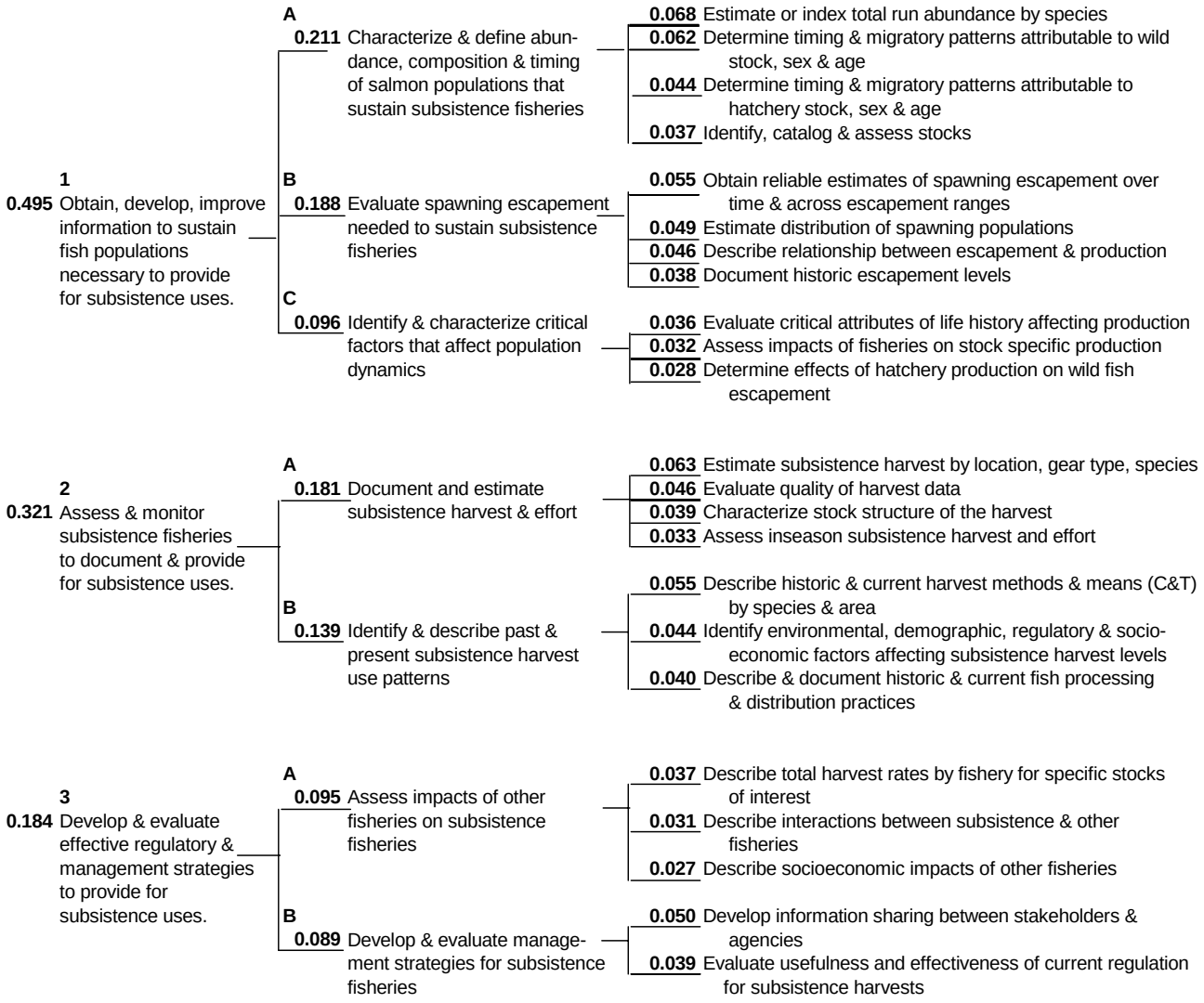


Figure 2. Framework of goals, objectives and information needs, including adjusted weights of importance, Copper River salmon fishery unit.

The workgroup was concerned about ensuring some investment on the part of the Monitoring Program into exploratory research and development of more cost efficient methodology, technology and/or approaches for conducting research and management activities. Specific concerns included the need to identify sources of error and improve accuracy, and invest in knowledge to design better tools and methods. Initially, the workgroup identified explicit information needs to address this basic research as part of the plan. However as the workgroup further considered the wisdom of addressing this concept throughout the plan, they concluded that these concepts are implicit priorities under the Monitoring Program, and that elements of the plan should be grounded in explicit informational needs for each subsistence fishery unit.

The workgroup identified three basic research objectives under Goal 1: assessment of salmon abundance, composition, and timing to rationally manage fisheries; evaluation of spawning escapement goals to sustain production; and characterization of critical life history factors to explain changes in population dynamics. Concepts discussed under Goal 1 included the appropriate use of "salmon stock" versus "population". After discussion, the workgroup used the definition of salmon stock found in State of Alaska regulation (5AAC 39.222): "A locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics, or an aggregation of two or more interbreeding groups which occur within the same geographic area and is managed as a unit". The definition of a "population" was left unresolved. Some members of the workgroup defined a "population" as the entire run of stocks for each species, while others felt that "population" represented a finer scale of classification with specific genetic characteristics such that a "stock" might actually be composed of multiple "populations". In either case, the lack of consensus underscores the need for more information to quantitatively define the various levels of organization for the species in this region. There was some discussion about how to define abundance to maintain subsistence fisheries, and assessment in the mainstem of the Copper River was differentiated from assessment of component escapements at the objective level. The information need to "Describe the relation between escapement and production" is intended to encompass evaluation of brood tables and survival. The influence of hatchery-run fish on wild salmon production, and monitoring of wild salmon escapement, was of concern to the group and is stated as two different information needs under Goal 1. The objective to "Identify and characterize critical factors affecting population dynamics" in Goal 1 is intended to address assessment of various habitats including spawning, rearing and migratory corridors.

Two basic research objectives were identified under Goal 2: the workgroup carefully delineated between the objectives of providing basic documentation of subsistence harvest and effort versus contextual information needed to understand harvest and use patterns. The workgroup debated the need to provide inseason assessment of subsistence fisheries for salmon under Goal 2. At current levels of abundance and after consideration of regulatory management plans, they unanimously concluded that inseason subsistence fisheries assessment is a very low priority during this planning horizon, and agreed with the guidance provided by a previous statewide workgroup (Fall and Shanks 2000), that inseason monitoring of subsistence harvests is necessary in only a limited set of

circumstances. The workgroup discussed the accuracy of harvest data from permits as they can be suspect in regards to number of fish by species, and timing of harvest. Additionally, coverage of permit data is questionable. The suggestion to develop partnerships to address suspect permit data was noted as a methodological approach and not an objective *per se***.**

Two basic research objectives were defined under Goal 3: to assess the interactions between subsistence and other competing fisheries; and to develop and evaluate management strategies for subsistence fisheries. Concepts discussed under Goal 3 include the need to integrate state and federal databases. Mechanisms to share information among stakeholders and agencies were discussed in the context of post-season summaries, pre-season workshops and protocols to improve interactions. The need to evaluate usefulness and effectiveness of current regulations for subsistence users includes obtaining reliable estimates of customary trade. The workgroup talked about trying to gauge whether subsistence needs are being met, however they decided that it was premature to address this topic, as State and Federal agencies are engaged in developing a protocol regarding subsistence use amounts. Descriptions of the relationships between subsistence and other fisheries include potential displacement and competition due to overlaps in location, timing, and harvest levels.

The need to examine alternative management strategies includes different approaches, such as scientific, traditional, or self-regulation concepts. The workgroup recognized that the priority of examining alternative management strategies would be lower, relative to more urgent information needs expressed in the framework. However, innovative management paradigms may offer benefits to managers and users. The workgroup suggested establishing a separate source of funds for proposals dealing with alternative management paradigms with state-wide application.

Priorities

Species of interest for assessment, in order of priority, are sockeye and Chinook salmon; coho salmon subsistence harvest is minor, thus the group focused discussions on sockeye and Chinook salmon.

Over both workshops, the workgroup carefully considered the relative importance of the goals – particularly the need to obtain information to sustain fish populations (Goal 1) in relation to the need to assess subsistence fisheries to provide for subsistence uses (Goal 2). The workgroup unanimously agreed that Goal 1 addressed the basic conservation mandate, which is foundational to providing for subsistence uses.

Prioritization of objectives within Goal 1 resulted in general agreement among the group regarding the importance of two of the three objectives (Figure 2). The group disagreed on the importance of objective c: to "Identify and characterize critical factors that affect population dynamics". This objective is the only element within Goal 1 that speaks to factors other than escapement levels, including habitat, as possible explanatory variables for changes in fish populations and dynamics. Rationale for rating this objective high for information needs included the importance of habitat as expressed by Native elders; and

the need to understand the dynamics influencing fluctuations in abundance. The alternative view was that this objective is largely relevant to maximizing production, and therefore an important research objective for commercial fisheries management as opposed to Federal subsistence management given the relative magnitude of the harvests.

Synthesis of priorities for information needs was conducted at two levels: within each individual goal, and over the entire framework combining information needs from all three goals. Synthesis of information needs at the goal level allows partitioning of information needs into three specific areas of study: assessment of fish populations, monitoring of subsistence fisheries, and evaluation of management actions. Examining information needs by goal could be helpful to collaboration with other planning efforts, or if organizations wanted to allocate resources according to one of these areas of study.

Prioritization of information needs within objectives generated the most intense debate on viewpoints of importance, which led to greater understanding of issues among the group. For instance, the workgroup explored the utility of historic information to current management and concluded that historic information pertains primarily to evaluation of Customary and Traditional Use findings. The impacts of enhanced production from the Gulkana River facility on wild stocks was thought by some to be of high importance, while others in the group thought this was of lesser importance compared with the impacts of fisheries on stock specific production. There was disagreement on whether describing the socioeconomic impacts of other fisheries (sport and commercial) was of greater or lesser importance than looking at interactions of other fisheries with subsistence fisheries (with potential impacts such as displacement).

For Goal 1, the top three information needs (Figure 3) are:

- estimate or index total run abundance by species,
- determine timing and migratory patterns attributable to wild stock, sex, age, and
- obtain reliable estimates of spawning escapement over time and across escapement ranges.

For Goal 2, the top three information needs (Figure 4) are:

- estimate subsistence harvest by location, gear type, species,
- describe historic and current harvest methods and means (Customary and Traditional uses) by species, area, and
- evaluate quality of harvest data.

For Goal 3, the top three information needs (Figure 5) are:

- develop information sharing between stakeholders and agencies,
- evaluate the usefulness and effectiveness of current regulations for subsistence harvests, and
- describe total harvest rates by fishery for specific stocks of interest.

However, it is the synthesis of information needs over the entire framework that is intended to clarify strategic priorities for the Monitoring Program. For the entire Copper River salmon fishery unit, the top 25% of information needs (Figure 6) are:

- estimate or index total run abundance by species,
- estimate subsistence harvest by location, gear type, species,
- determine timing and migratory patterns attributable to wild stock, sex, age,
- obtain reliable estimates of spawning escapement over time and across escapement ranges,
- describe historic and current harvest methods and means (Customary and Traditional uses) by species, area,
- develop information sharing between stakeholders and agencies.

Public and Council comments largely agreed with the priorities identified by the workgroup. The top 25% of information needs reflect the highest priorities within each goal, particularly the need to obtain information to sustain fish populations (Goals 1) and the need to assess subsistence fisheries (to provide for subsistence uses) (Goal 2). The lowest priority information needs either largely come from Goal 3, or reflect disagreement among workgroup members (effects of hatchery production on wild fish escapement, for example), or are information needs that the workgroup did not anticipate as priorities during the 3-5 year planning horizon (inseason assessment of subsistence fisheries).

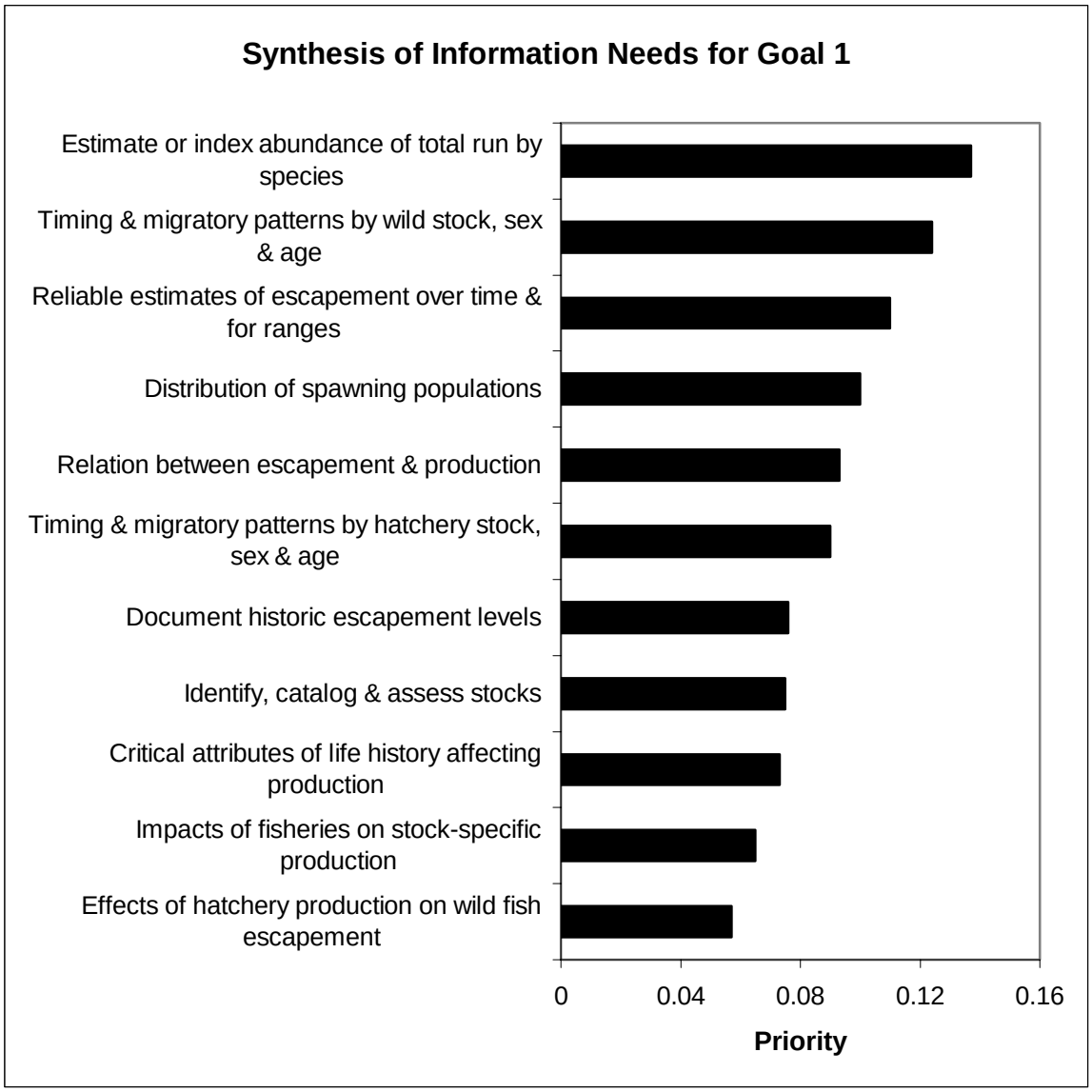


Figure 3. The priority of information needs for Goal 1: Obtain, develop and improve information to sustain fish populations necessary to provide for subsistence uses, Copper River salmon fishery unit.

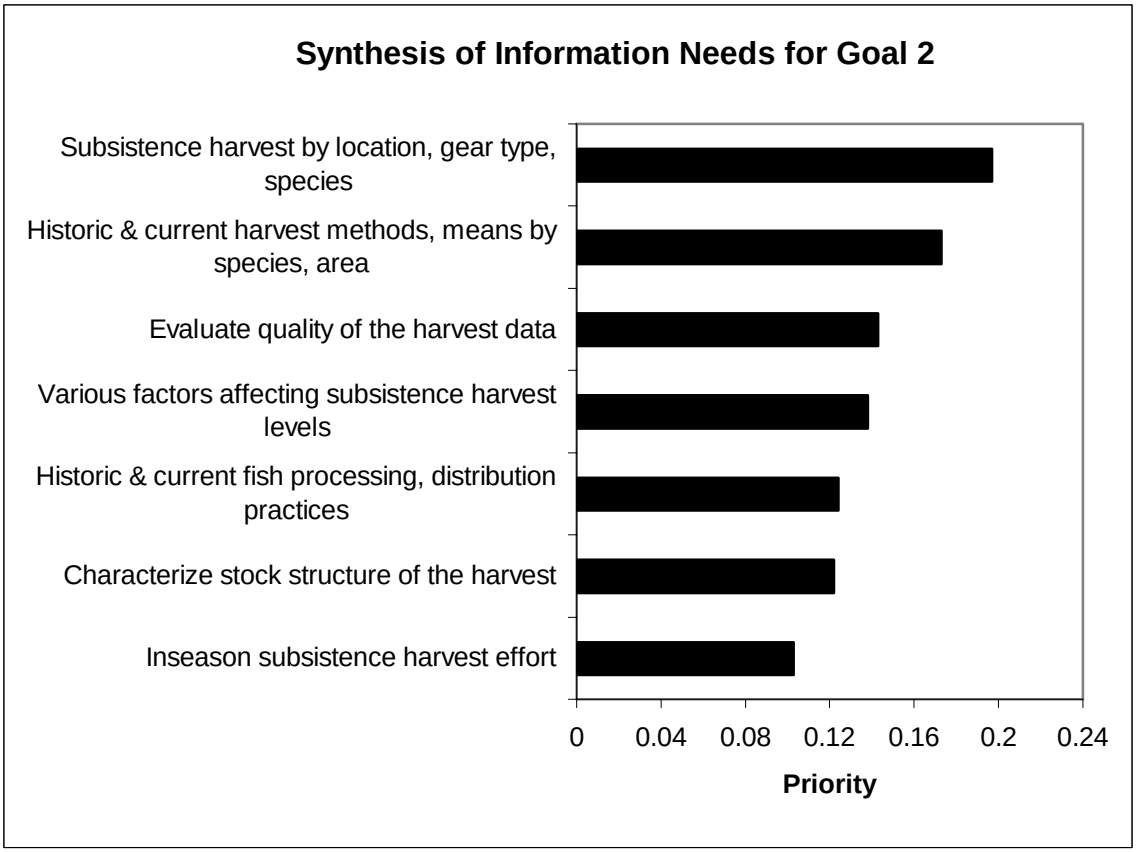


Figure 4. The priority of information needs for Goal 2: Assess and monitor subsistence fisheries to document and provide for subsistence uses, Copper River salmon fishery unit.

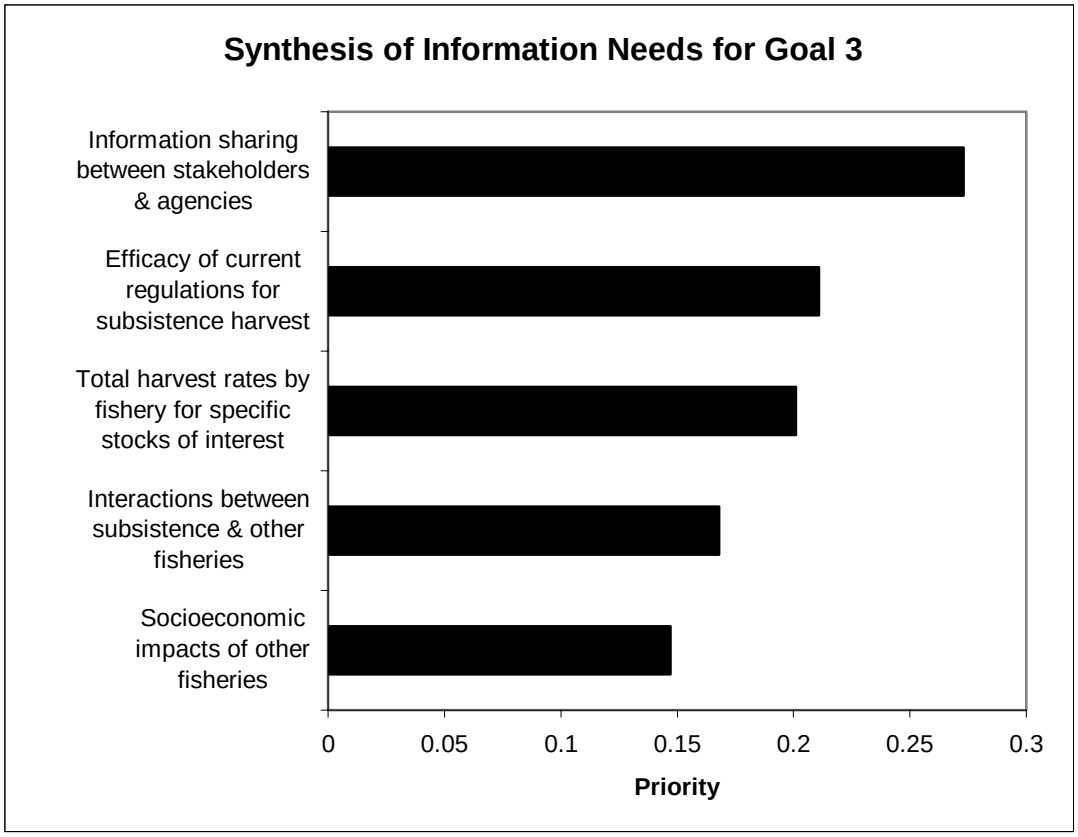


Figure 5. The priority of information needs for Goal 3: Develop and evaluate regulatory and management strategies to provide for subsistence uses, Copper River salmon fishery unit.

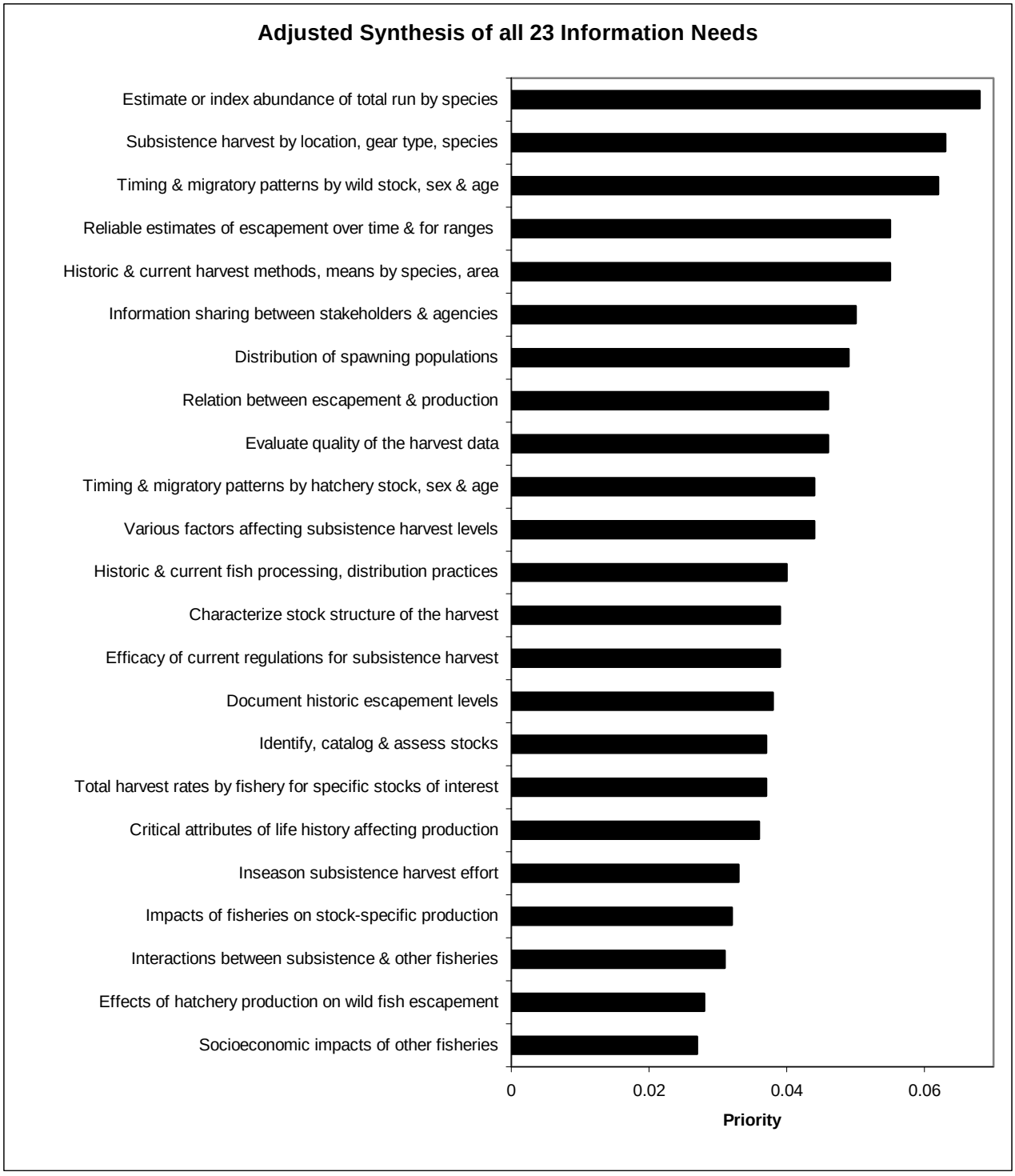


Figure 6. Adjusted synthesis of all 23 information needs, Copper River salmon fishery unit.

Subsistence Fishery Unit: Copper River Freshwater Species

A total of 22 elements comprise the planning framework: 3 goals, 4 objectives, and 15 unique information needs (Table 3). Workgroup members recognized that the central issue for subsistence fisheries managers is to maintain harvests for lake populations of burbot and lake trout within sustainable limits. In addition, they considered the state's comprehensive freshwater research program in the Copper River Basin, particularly noting its expense, and concluded that the primary freshwater stocks of interest during the 3-5 year planning horizon should be focused on burbot and lake trout populations in McCarthy and Nabesna Road lakes, and Tanada and Copper lakes. Removal of other species (Arctic grayling, Dolly Varden, and whitefish) from consideration of Goal 1 information needs for this fishery unit during the 3-5 year planning horizon effectively reduced Goal 1 to four unique information needs that the workgroup did not partition by separate research objectives. The workgroup concluded that information needs relating to Goal 1 for species other than burbot and lake trout, particularly riverine populations, would most appropriately be left for future strategic planning. Workgroup members recognized that current information needs for other species could be satisfied under Goals 2 and 3, particularly monitoring of the subsistence fisheries for these species.

Table 3. Objectives and information needs identified for goals of the Copper River freshwater species subsistence fishery unit, Southcentral region, 2004.

Goals	Objectives / Information Need
1. Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.	1. Estimate or index total abundance and composition by species. 2. Evaluate spawning abundance needed to sustain subsistence fisheries. 3. Identify, characterize critical factors affecting population dynamics. 4. Document historic distribution and abundance levels.
2. Assess and monitor subsistence fisheries to document and provide for subsistence uses.	2a. Document and estimate subsistence harvest and effort. 1. Estimate subsistence harvest by location, gear type, species. 2. Characterize stock structure of the harvest. 3. Evaluate quality of harvest data. 2b. Identify and describe past and present subsistence harvest use patterns. 1. Describe historic methods and means (C&T) by species, area. 2. Describe current methods and means (C&T) by species, area. 3. Describe, document historic and current processes, distribution practices 4. Identify environmental, demographic, regulatory, socioeconomic factors affecting subsistence harvest levels.
3. Develop and evaluate management strategies for subsistence fisheries.	3a. Develop and evaluate management strategies for subsistence fisheries. 1. Evaluate usefulness and effectiveness of current regulations for subsistence harvests. 2. Develop information sharing between stakeholders and agencies. 3b. Assess impacts of other fisheries on subsistence fisheries. 1. Describe relationship between sport and subsistence fisheries for specific stocks on federal public waters. 2. Describe socioeconomic impacts of other fisheries.

Subsistence Fishery Unit: Prince William Sound-Delta Salmon

A total of 18 elements comprise the planning framework: 2 goals, 4 objectives, and 12 unique information needs (Table 4). Because of very limited subsistence fisheries for salmon within Prince William Sound, the workgroup concluded that inclusion of an information need to identify, catalog and assess salmon stocks is outside the 3-5 year planning horizon for the Monitoring Program; however, this information need should be re-considered when the strategic plan is updated. Considering the relatively small subsistence fisheries for salmon in this fishery unit, the workgroup concluded that it would be inappropriate to include any information needs relating to developing or evaluating management strategies for subsistence fisheries within the planning horizon.

Table 4. Objectives and information needs identified for goals of the Prince William Sound-Delta salmon subsistence fishery unit, Southcentral region, 2004.

Goals	Objectives / Information Needs
1. Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.	1a. Characterize and define abundance, composition and timing of salmon populations that sustain subsistence fisheries. 1. Determine timing, migratory patterns attributable to hatchery stock, sex, age. 2. Estimate or index abundance of total run by species. 3. Determine timing, migratory patterns attributable to wild stock, sex, age. 1b. Evaluate spawning escapement needed to sustain subsistence fisheries. 1. Obtain reliable estimates of spawning escapement over time and across escapement ranges. 2. Document historic escapement levels. 3. Estimate distribution of spawning abundance.
2. Assess and monitor subsistence fisheries to document and provide for subsistence uses.	2a. Document and estimate subsistence harvest and effort. 1. Characterize stock structure of the harvest. 2. Estimate subsistence harvest and effort by location, gear type, species. 2b. Identify and describe past and present subsistence harvest use patterns. 1. Describe historic methods and means by species, area. 2. Describe current methods and means by species, area. 3. Describe and document historic and current processes and distribution practices. 4. Identify environmental, demographic, regulatory and socioeconomic factors affecting subsistence harvest levels.

Subsistence Fishery Unit: Copper River Rainbow/Steelhead

As an incidental species of relatively low abundance, steelhead was identified as a separate fishery unit. This fishery unit also addresses subsistence fisheries for resident rainbow trout within the Copper River drainage. A total of 22 elements comprise the planning framework: 2 goals, 5 objectives, and 15 unique information needs (Table 5). The central information need for this fishery unit is estimation of, and management for, sustainable harvest levels. Similar to the rationale for Prince William Sound-Delta salmon, the workgroup concluded that for this fishery unit it would be inappropriate to include any information needs relating to developing or evaluating management strategies for subsistence fisheries within the planning horizon.

Table 5. Objectives and information needs identified for goals of the Copper River steelhead subsistence fishery unit, Southcentral region, 2004.

Goals	Objectives / Information Needs
1. Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.	1a. Characterize and define abundance, composition and run timing of steelhead populations that contribute to subsistence fisheries. 1. Estimate or index abundance of total run by species. 2. Determine timing, migratory patterns attributable to wild stock, sex, age. 3. Identify, catalog, and assess stocks. 1b. Evaluate spawning escapement needed to sustain returns. 1. Obtain reliable estimates of spawning escapement over time and across escapement ranges. 2. Document historic escapement levels. 3. Estimate distribution of spawning populations. 4. Understand relation between escapement and production. 1c. Identify and characterize critical factors that affect population dynamics. 1. Evaluate critical attributes of life history affecting production. 2. Assess impacts of fisheries on stock specific production.
2. Assess and monitor subsistence fisheries to document and provide for subsistence uses.	2a. Document and estimate subsistence harvest and effort. 1. Characterize stock structure of the harvest. 2. Estimate subsistence harvest by location, gear type, species. 3. Evaluate quality of harvest data. 2b. Identify and describe past and present subsistence harvest use patterns. 1. Describe historic methods and means of harvest by area. 2. Describe current methods and means of harvest by area. 3. Describe and document historic and current processes and distribution practices.

Subsistence Fishery Unit: Copper River Eulachon

A total of 29 elements comprise the planning framework: 3 goals, 7 objectives, and 19 unique information needs (Table 6). Although eulachon represent a much smaller proportion of overall subsistence harvests than do salmon, the workgroup concluded that there are legitimate information needs for all three goals to consider under the Monitoring Program within this planning horizon. In fact Goal 3 information needs, particularly interactions between subsistence and other fisheries, have already been addressed under the Monitoring Program. Given the paucity of knowledge about eulachon in general, the workgroup maintained a fairly extensive framework of information needs for this fishery unit.

Table 6. Objectives and information needs identified for goals of the Copper River eulachon subsistence fishery unit, Southcentral region, 2004.

Goals	Objectives / Information Needs
1. Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.	1a. Characterize and define abundance, composition and timing of eulachon populations that sustain subsistence fisheries. 1. Estimate or index abundance of total run. 2. Determine timing, migratory patterns attributable to stock, sex, age. 3. Describe population structure of eulachon of the CRD and PWS. 1b. Evaluate spawning biomass needed to sustain subsistence fisheries. 1. Obtain reliable estimates of spawning biomass over time, spawning ranges. 2. Understand relation between spawning biomass and production. 1c. Identify, characterize critical factors affecting population dynamics. 1. Evaluate critical attributes of life history affecting freshwater survival. 2. Assess impacts of fisheries on stock specific production.
2. Assess and monitor subsistence fisheries to document and provide for subsistence uses.	2a. Document and estimate subsistence harvest and effort. 1. Characterize stock structure of the harvest. 2. Estimate subsistence harvest and effort by location, gear type, species. 3. Evaluate quality of harvest data. 2b. Identify, describe past/present subsistence harvest use patterns. 1. Describe historic methods and means of harvest by area. 2. Describe current methods and means of harvest by area. 3.Describe, document historic and current processes and distribution practices. 4. Identify environmental, demographic, regulatory and socioeconomic factors affecting subsistence harvest levels.
3. Develop and evaluate effective regulatory and management strategies to provide for subsistence uses.	3a. Develop and evaluate management strategies for subsistence fisheries. 1. Evaluate usefulness, effectiveness of current regulations for subsistence harvests. 2. Develop information sharing between stakeholders and agencies. 3b. Assess impacts of other fisheries on subsistence fisheries. 1. Describe total harvest rates by fishery for specific stocks of interest. 2. Describe interactions between subsistence and other fisheries. 3. Describe socioeconomic impacts of other fisheries.

Subsistence Fishery Unit: Prince William Sound-Delta Freshwater Species

A total of 13 elements comprise the planning framework: 2 goals, 3 objectives, and 8 unique information needs (Table 7). The primary species of interest include cutthroat trout, Dolly Varden, and whitefish. Of concern is the potential development of subsistence fisheries beyond sustainable levels. Therefore, the workgroup included information needs that address both sustainability of freshwater fish populations (Goal 1) and monitoring of subsistence fisheries (Goal 2).

Table 7. Objectives and information needs identified for goals of the Prince William Sound-Delta freshwater species subsistence fishery unit, Southcentral region, 2004.

Goals	Objectives / Information Needs
1. Obtain, develop, and improve information to sustain fish populations necessary to provide for subsistence uses.	1a. Characterize, define abundance, composition and timing of freshwater species populations that sustain subsistence fisheries. 1. Estimate or index total abundance and composition by species. 2. Determine timing, migratory patterns attributable to stock sex, age.
2. Assess and monitor subsistence fisheries to document and provide for subsistence uses.	2a. Document and estimate subsistence harvest and effort. 1. Characterize stock structure of the harvest. 2. Estimate subsistence harvest and effort by location, gear type, species. 2b. Identify and describe past and present subsistence harvest use patterns. 1. Describe historic methods and means by species, area. 2. Describe current methods and means by species, area. 3. Describe and document historic and current processes and distribution practices. 4. Identify environmental, demographic, regulatory and socioeconomic factors affecting subsistence harvest levels.

PROJECT INVENTORY AND GAP ANALYSIS

The final phase of the strategic plan was the November 8-9 workshop where the workgroup developed project inventories and gap analyses by fishery unit.

METHODS

Participants

Most of the participants at the initial meeting returned for the second meeting; the workgroup was pleased to welcome an additional Council member (Appendix C-2). The meeting was co-chaired by staff from FIS, and was again facilitated by Dr. Merritt.

Project Inventory

A comprehensive inventory of all relevant projects, past and present, was developed for each information need. The workgroup provided a broad base of expertise to develop this inventory across organizations and funding sources.

Several months prior to the second workshop, workshop participants were asked to complete a spreadsheet template for their organization that summarized relevant projects for each information need by subsistence fishery unit. Requested information for each project included: project title, location, species addressed, summary of the information collected or specific activity, project duration, funding source, and current status including how well the project addressed the information need. Staff at FIS then coalesced each participant's submission into a single spreadsheet, organized within the context of the plan framework at the information need level. Project inventories were then reviewed at the November workshop.

Gap Analysis

The project inventory provided the basis to conduct the gap analysis. At the workshop, participants formed subgroups to review project inventories, evaluate gaps in knowledge, and make recommendations. Subgroup evaluation and recommendations were presented to the entire workgroup for further consideration and final refinement. For the gap analysis, the workgroup made two assessments for each information need. Using the project inventory, they first summarized the current state of knowledge for each information need using three categories: "adequate", "partially known", "largely unknown" (Table 8). Second, they provided recommendations of what needs to be done over the next 3-5 years to address each information need: either "no action", or "consider proposals". Standardized responses were developed for each assessment (Table 8) to clarify both what is known and what needs to be done for subsistence fisheries management and assessment. For example, while knowledge regarding an information need may be judged as adequate to guide management, proposals that address this information need may still be considered for funding because the research need is ongoing. Conversely, while knowledge regarding an information need may be inadequate, proposals might not be considered ("no action") because the need to know may be intermittent, or projects are already underway to address the information need.

Table 8. Standardized responses for assessments by information need, Southcentral gap analysis.

Current state of knowledge	What needs to be done?
Knowledge is adequate. Definition: There is little uncertainty regarding this information need. The existing program provides sufficiently accurate and timely information to give meaningful guidance to managers.	**No action.** Definition: Project(s) are in place or have been completed. Funding is committed and adequate through the next funding cycle. **Consider proposals** Definition: Maintenance of this data base or activity is required because there is an ongoing need. Or, there are inadequate projects to address this information need. Funding is not committed, or is currently inadequate, to address this information need through the next funding cycle. It is a strategic priority of the Monitoring program to consider new proposals under this information need at this time.
Knowledge is partially known. Definition: There is some uncertainty regarding this information need. The existing program provides some information; however, historic project results may need updating, or, there is a project in place but it may need to be improved to give meaningful guidance to managers.	**No action.** Definition: Project(s) are in place or have been completed. Funding is committed and adequate through the next funding cycle. **Consider proposals** Definition: There are inadequate projects to address this information need. Funding is not committed, or is currently inadequate, to address this information need through the next funding cycle. It is a strategic priority of the Monitoring program to consider new proposals under this information need at this time.
Knowledge is largely unknown. Definition: There is much uncertainty regarding this information need. The existing program provides little or no information. Few, if any, projects have been conducted; or, results of projects are incomplete or inadequate. There is virtually no information to give meaningful guidance to managers.	**No action.** Definition: Synthesis of information is being conducted, or circumstances have determined that this information is not necessary or only intermittently needed. **Consider proposals** Definition: There are inadequate projects to address this information need. Funding is not committed, or is currently inadequate, to address this information need through the next funding cycle. It is a strategic priority of the Monitoring program to consider new proposals under this information need at this time.

RESULTS AND DISCUSSION

Project inventories were completed for each fishery unit. However, at the November workshop there was only time to complete gap analyses for the two highest priority fishery units: Copper River salmon and Copper River freshwater species.

Copper River Salmon

For the Copper River salmon subsistence fishery unit, the workgroup identified a total of 38 projects that have relevance to the information needs identified in the strategic plan (Appendix Table D-1). Funded projects are not evenly distributed among the information needs– there are as many as five projects addressing some needs (e.g., "Estimate or index total run abundance by species," and "Describe historic and current methods and means by species, area," whereas for other needs there are no projects (e.g., "Evaluate critical attributes of life history affecting production" and "Describe interactions between subsistence and other fisheries").

Using the information from the project inventory, the workgroup identified knowledge gaps for Federal management of Copper River salmon subsistence fisheries (Appendix Table D-2). Of the 23 information needs identified for the Copper River salmon subsistence fishery unit, the workgroup surmised that only four had "adequate knowledge" - sufficiently accurate and timely information to give meaningful guidance to managers. For the majority of information needs, the state of knowledge was deemed "partially known." Only three information needs were deemed to be in the status of "largely unknown." Following assessment of knowledge gaps for each information need, the workgroup recommended that 13 information needs (56.5%) be considered for proposals in the subsequent annual Monitoring Plan (Table 9).

The gap analysis was overlaid with the priority ranking of information needs to identify the highest strategic priorities in the Southcentral Region for the annual monitoring plan (Figure 7). The workgroup recommended consideration of proposals for two information needs for which knowledge was rated as 'adequate' ("Estimate or index total run abundance by species;" and "Estimate subsistence harvest by location, gear type, and species"). These were rated as the highest priority information needs in the strategic plan (Figures 6 and 7), and the workgroup concluded that there were ongoing needs to maintain these databases.

Table 9. Summary of the state of knowledge and recommendations for action for the Copper River salmon subsistence fishery unit gap analysis, by information need, 2004.

	State	of	Knowledge	To Be	Done
Information Need	**Adequate**	**Partially known**	**Largely unknown**	**No Action**	**Consider Proposals**
1.a.1. Estimate or index total run abundance by species.	**X**				**X**
1.a.2. Determine timing & migratory patterns attributable to wild stock sex, age.		**X**		**X**	
1.a.3. Determine timing & migratory patterns attributable to hatchery stock sex, age.		**X**		**X**	
1.a.4. Identify, catalog, assess stocks.		**X**			**X**
1.b.1. Obtain reliable estimates of spawning escapement over time & across escapement ranges.		**X**		**X**	
1.b.2. Estimate distribution of spawning populations.		**X**		**X**	
1.b.3. Describe relationship between escapement & production.		**X**			**X**
1.b.4. Document historic escapement levels.		**X**			**X**
1.c.1. Evaluate critical attributes of life history affecting production.			**X**		**X**
1.c.2. Assess impacts of fisheries on stock specific production.		**X**		**X**	
1.c.3. Determine effects of hatchery production on wild fish escapement		**X**		**X**	
2.a.1. Estimate subsistence harvest by location, gear type, species.	**X**				**X**
2.a.2. Evaluate quality of harvest data.		**X**			**X**
2.a.3. Characterize stock structure of the harvest.		**X**		**X**	
2.a.4. Assess inseason subsistence harvest effort			**X**	**X**	
2.b.1. Describe historic & current methods and means by species, area.	**X**			**X**	
2.b.2.Identify environmental, demographic, regulatory, socioeconomic factors affecting subsistence harvest levels.		**X**			**X**
2.b.3. Describe, document historic and current processes, distribution practices	**X**			**X**	
3.a.1. Describe total harvest rates by fishery for specific stocks of interest.		**X**			**X**
3.a.2. Describe interactions between subsistence and other fisheries.			**X**		**X**
3.a.3. Describe socioeconomic impacts of other fisheries.		**X**			**X**
3.b.1.Develop information sharing between stakeholders and agencies.		**X**			**X**
3.b.2.Evaluate usefulness and effectiveness of current regulations for subsistence harvests.		**X**			**X**

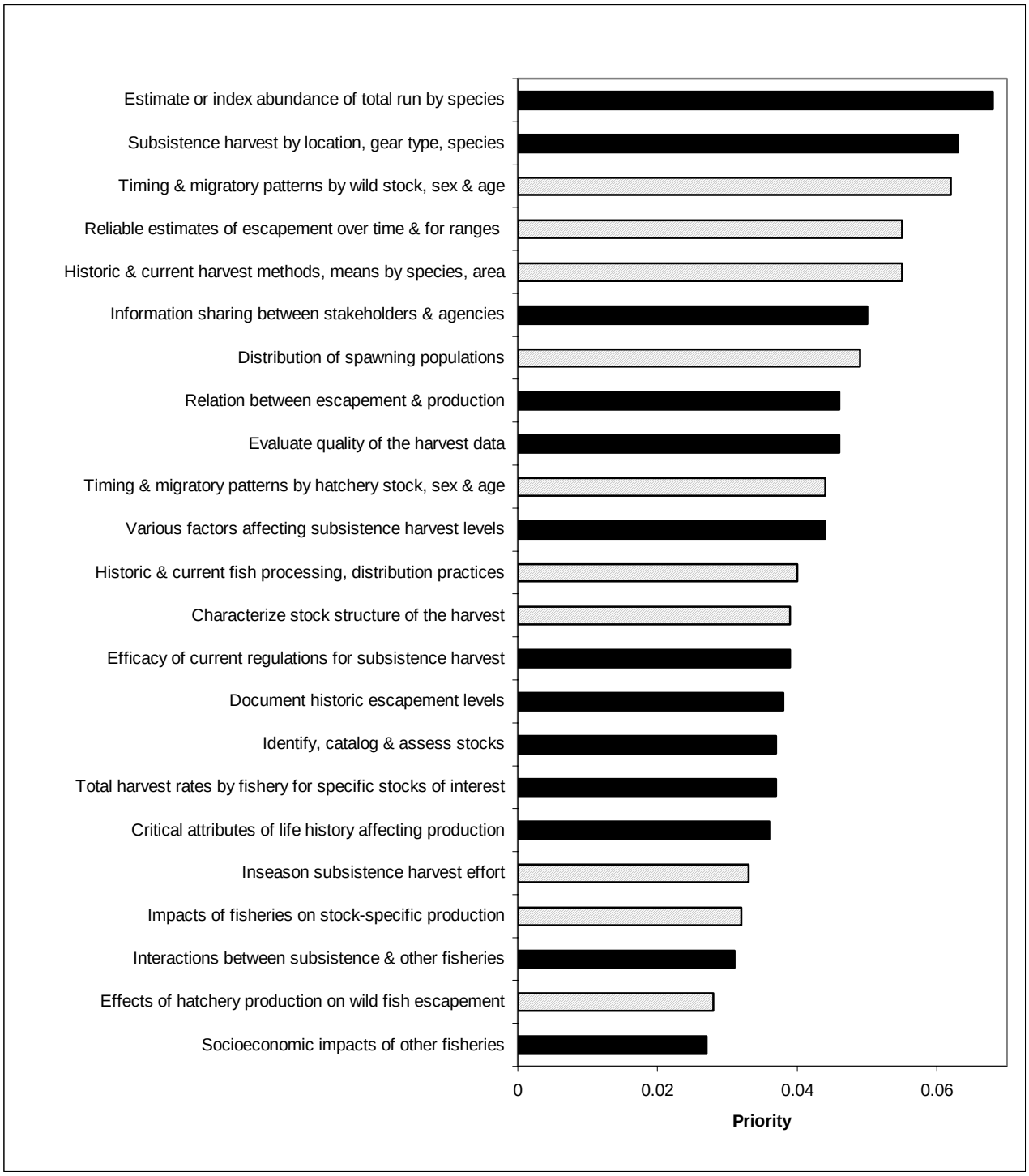


Figure 7. Information needs recommended for proposals from the gap analysis, shown as solid black bars, in rank order of priority, for the Copper River salmon subsistence fishery unit, Southcentral region, 2004 (hatched bars indicate "no action" – see Table 9).

Copper River Freshwater Species

For the Copper River freshwater species subsistence fishery unit, the workgroup identified 21 projects that have relevance to the information needs identified in the strategic plan (Appendix Table E-1). The projects are not evenly distributed among the information needs – there are as many as six projects addressing some needs (e.g., "Describe historic methods and means (C&T) by species and area") whereas for other needs there are no projects (e.g., "Identify and characterize critical factors affecting population dynamics" and "Characterize stock structure of the harvest").

Using the information from the project inventory, the workgroup identified knowledge gaps for Federal management of Copper River salmon subsistence fisheries (Appendix Table E-2). Of the 15 information needs identified for the Copper River freshwater species subsistence fishery unit, the workgroup surmised that only three had "adequate knowledge" - sufficiently accurate and timely information to give meaningful guidance to managers. The state of knowledge for the remainder of information needs was evenly split between "partially known" and "largely unknown".

Following assessment of knowledge gaps for each information need, the workgroup recommended that seven information needs (46.7%) be considered for proposals in the subsequent annual Monitoring Plan (Table 10).

Time limitations precluded the workgroup from prioritizing information needs for the Copper River freshwater species subsistence fishery unit, as was done for Copper River salmon. Nonetheless the workgroup felt that the planning products that were completed for this fishery unit provided useful direction for guiding resources for the annual monitoring plan.

Other Copper River and Prince William Sound Fishery Units

The workgroup completed project inventories by information need for Prince William Sound-Delta salmon (Appendix F), Copper River rainbow/steelhead (Appendix G), Copper River eulachon (Appendix H), and Prince William Sound-Delta freshwater species (Appendix I). There was insufficient time during the 2-day workshop to finish any other planning products for these fishery units.

Table 10. Summary of the state of knowledge and recommendations for action for the Copper River freshwater species subsistence fishery unit gap analysis, by information need, 2004.

	State	of	Knowledge	To Be	Done
Information Need	**Adequate**	**Partially known**	**Largely unknown**	**No Action**	**Consider Proposals**
1. Estimate or index total abundance and composition by species.		**X**			**X**
2. Evaluate spawning abundance needed to sustain subsistence fisheries.			**X**		**X**
3. Identify and characterize critical factors affecting population dynamics.		**X**		**X**	
4. Document historic distribution and abundance levels.		**X**			**X**
2.a.1. Estimate subsistence harvest by location, gear type, species.	**X**			**X**	
2.a.2. Characterize stock structure of the harvest.			**X**	**X**	
2.a.3. Evaluate quality of harvest data.			**X**	**X**	
2.b.1. Describe historic methods and means (C&T) by species, area.	**X**			**X**	
2.b.2. Describe current methods and means (C&T) by species, area.	**X**			**X**	
2.b.3. Describe, document historic and current processes, distribution practices		**X**		**X**	
2.b.4.Identify environmental, demographic, regulatory, socioeconomic factors affecting subsistence harvest levels.		**X**			**X**
3.a.1. Evaluate usefulness and effectiveness of current regulations for subsistence harvests.			**X**		**X**
3.a.2. Develop information sharing between stakeholders and agencies.		**X**			**X**
3.b.1. Describe relationship between sport and subsistence fisheries for specific stocks on federal public waters			**X**		**X**
3.b.2. Describe socioeconomic impacts of other fisheries.			**X**	**X**	

CONCLUSIONS

Major achievements from the planning workshops include:

- the development of planning frameworks for all six subsistence fishery units,
- prioritization of subsistence fishery units for informational needs,
- prioritization of information needs for the Copper River salmon subsistence fishery unit,
- project inventories for all six subsistence fishery units,
- gap analyses for Copper River salmon and Copper River freshwater species, and
- a recommendation for the Monitoring Program to fund statewide research on alternative subsistence management strategies and paradigms.

Additional results include:

- increased knowledge and awareness of research and management concerns fostered through facilitated discussions,
- the development of a dialog between participants, and,
- learning about a systematic approach to planning and problem-solving.

Although not all planning products were completed, workgroup members felt that sufficient progress was achieved to ensure that the Monitoring Program remains focused on the highest priorities for management of Federal subsistence fisheries during the 3-5 year plan horizon. However, workgroup members recommended that the planning process "be kept moving" through subsequent meetings – indicating that participants generally accepted the process of stakeholder involvement in decision-making.

Following the two workshops, participants made positive comments about the opportunity for open discussion during planning, and the interactive exchanges between biologists, social scientists and Council members. These group discussions were "stimulating" and fostered "learning more about aspects of fisheries." The planning approach was found to be "innovative", with "appreciation for the quantitative aspects," and rated overall as "generally interesting."

Some participants indicated that more time was needed for planning. Completeness and accuracy of a plan is influenced by the length of time that is allotted to planning as well as expertise and opinions of participants. The commitment necessary for a meaningful length of time for group participation may be difficult to obtain. For the Southcentral planning effort, a total of five days of planning was partitioned into two separate meetings, allowing time in-between for review and reflection. Considering the size of the geographic area, multiple fisheries and agency jurisdictions involved, the workgroup arrived at remarkable consensus in a relatively efficient manner.

Several participants commented on the composition of the group and its size – they recommended more balance through greater representation of Council members and disciplines; however, they also recognized the practical limitations of increasing the size of the workgroup. A significant aspect of planning is to decide who should participate and how public opinions should be incorporated into the planning process. It is generally agreed that participation of stakeholders in planning can lead to improved fisheries management (Lane 1989). Stakeholder input on issues of concern and support of the planning process is important to the long-term success of a strategic approach to sustainable fisheries because group consensus provides greater validity to conclusions (Saaty 1999). In the development of previous strategic plans for sustainable fisheries, stakeholders have provided key insights to issues comprising a problem and possible solutions (Merritt and Criddle 1993, Merritt 1995, Merritt and Skilbred 2002). Participants for the Southcentral meeting were solicited from regional professionals in the fields of biology, social science, and members of the Council. Several workshop participants were unable to attend both workshops (see Appendix C). However, there appeared to be sufficient diverse viewpoints to stimulate discussion, address divergent viewpoints, and create a reasonable ranking of information needs to achieve the mission. Addtionally, the workgroup actively solicited and addressed review comments from a wide range of affected publics.

The strategic plan developed by the workgroup improved upon the Southcentral Council's list of information needs (OSM 2004). It appears that all information needs identified through Council were addressed in the framework developed by the workgroup.

Council's information need	**Found in the framework in Figure 2**
Conduct stock identification studies	Goal 1, A 3 & 4
Population estimates for salmon spawning in tributaries	Goal 1, B 1
Study the impact of beaver dams on salmon spawning habitat	Goal 1, C 1
Document run timing and life histories	Goal 1, A 3 & C 1
Assess decline in burbot	See Table 3
Evaluate feasibility of moving sonar closer to mouth	Goal 1, A 1
Assessment of fish stocks where access has been improved	Goal 3, A 1&2
Assessment of harvest patterns for all users	Goal 2, A; Goal 3, B 1&2
Identify preferred subsistence use areas Document subsistence needs and harvest levels	Goal 2, B
Document streams pioneered by new salmon populations and streams no longer productive	Goal 1, B
Study inter- and intra-annual variations in salmon runs	Goal 1, C

Identical to the Council, the workgroup ranked Copper River salmon as the highest priority for investment of Monitoring Program funds over other subsistence fishery units. However, the Council's list contrasted with the workgroup's framework in several ways. While the Council's list included, "Document subsistence needs", no such statement exists in the workgroup's framework. The workgroup consciously excluded assessment

of whether subsistence needs were being met, pending resolution of State and Federal protocol regarding this matter (see discussion of concepts addressed under Goal 3, page 17). The Council had two information needs under the category of TEK, whereas the workgroup considered TEK as a methodology that could potentially address information needs throughout the framework. The Council had only one information need concerning a freshwater species (burbot in the Copper River drainage), whereas the workgroup developed entire frameworks of information needs for two freshwater species subsistence fishery units: Copper River, and Prince William Sound/Delta. While the Council acknowledged the importance of research in Prince William Sound, they developed no specific information needs. In contrast, the workgroup developed frameworks of information needs for two Prince William Sound subsistence fishery units, including the Copper River Delta salmon and freshwater species.

This strategic plan identifies information needed to manage for subsistence uses on Federal public lands in the Copper River basin and Prince William Sound. The plan is envisioned as being dynamic in that the gap analysis can be updated annually, providing a timely mechanism to identify strategic priorities for information in each year's annual monitoring plan. This strategic plan should provide an explicit and rigorously developed forum for researchers, the TRC, the Council, and the Board to focus Monitoring Program funding towards the highest informational priorities in the Southcentral Region.

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Appendix A. Letter from Tom Boyd, Assistant Regional Director, Office of Subsistence Management, outlining strategy to determine priority information needs for the Subsistence Fisheries Resource Monitoring Program, February 17, 2004.

OFFICE OF SUBSISTENCE MANAGEMENT

3601 C Street, Suite 1030
Anchorage, Alaska 99503-6199

STRATEGY TO DETERMINE PRIORITY INFORMATION NEEDS

for the
Fisheries Resource Monitoring Program

Over the past five years, the Office of Subsistence Management has successfully developed and implemented the Fisheries Resource Monitoring Program in support of Federal subsistence fisheries management. Over 200 monitoring and research projects have been implemented on Federal lands across Alaska. A cornerstone of the Monitoring Program has been identification of Issues and Information Needs through the Regional Advisory Councils, which have been used to guide solicitation of proposals for the Monitoring Program. I would like to build upon the Issues and Information Needs process by implementing a broad-based strategic planning effort to ensure the Monitoring Program is focused on our highest priorities for management of Federal subsistence fisheries.

To ensure strategic use of our limited funds, the Office of Subsistence Management will facilitate a collaborative process to develop three products for the Monitoring Program:
(1) goals, objectives, and information needs by region for Federal subsistence fishery management; (2) identification of gaps in knowledge for each information need; and
(3) prioritization of information needs for solicitation of study proposals. The results of this effort will yield a more focused Call for Proposals for the Fisheries Resource Monitoring Program.

For each region, the Fisheries Information Services (FIS) Division in my office, will take the lead to convene a facilitated workshop of regional managers, scientists, council members, and stakeholders to identify key information needed to better manage Federal subsistence fisheries. The Fisheries Information Services Division will solicit workshop participation from appropriate Federal agencies, the Alaska Department of Fish and Game, academia, Alaska Native, and rural organizations to collectively develop and prioritize regional management and regulatory information needs. To effectively transition from Issues and Information Needs already developed through the Regional Advisory Councils, we will also ask the appropriate Regional Advisory Councils to provide up to two members for each regional workshop.

Results from these workshops will provide the basis for FIS staff to draft reports that address products discussed in the second paragraph of this letter. Where appropriate, efforts of existing regional planning groups will be utilized to help accomplish these tasks.

We will be employing a facilitated approach in these workshops using the Analytic Hierarchy Process as the methodology to frame discussion, formulate recommendations, and document results. This methodology has been widely used for 35 years in planning and problem solving for many applications worldwide and most recently as part of similar planning efforts for fisheries assessment in the Yukon, Kuskokwim, Southeast Alaska, and marine areas of Alaska.

Planning efforts will be conducted in 7 regions to cover the entire state, and one to two workshops will be conducted in each region. For 2004, we will focus planning efforts on the Southcentral region and the Bristol Bay portion of the Southwest region. Draft reports for Bristol Bay and Southcentral will be presented to the appropriate Regional Advisory Councils for review and comment at the fall 2004 meetings. Final reports will then be prepared and will provide the basis for prioritizing information needs in the subsequent Call for Proposals, and for assessing strategic priority during evaluation of proposals.

Overall, it is our intent to complete planning efforts to determine prioritized information needs for the Bristol Bay and Southcentral regions this year. We will implement these same efforts for the Northern, Southeast, and Kodiak portion of the Southwest region in the fall of 2005. We intend to utilize results from the comprehensive and collaborative planning exercises already underway for Kuskokwim and Yukon salmon to develop information needs for these two regions. All regional plans will be presented to the appropriate Regional Advisory Councils as drafts, and we intend to complete all plans by November 2006.

Our strategic planning efforts will be a major undertaking over the next two years, but these efforts will provide a rigorous and comprehensive analysis of information needs to focus the Monitoring Program on our highest priorities for management of Federal subsistence fisheries. We look forward to your support and involvement in completing these plans.

Sincerely,

/s/ *Thomas H. Boyd*

Thomas H. Boyd
Assistant Regional Director

Appendix B. A glossary of terms and phrases from discussions in the development of a strategic plan to support the Fisheries Resource Monitoring Program in Southcentral, 2004.

AHP – Analytic Hierarchy Process

ASL - age, sex, and length

Capacity building - projects that contribute to the abilities of Alaska Native organizations, local communities, and rural residents to meaningfully participate and be trained in fisheries resource management.

C&T – Customary and traditional

Customary trade - the traditional cash sales of subsistence-harvested fish and wildlife.

Escapement - annual estimated abundance of spawning fish.

Enhancement - artificial efforts to increase salmon abundance; including: stocking, fertilization, and structural improvements (fish passes, culverts, egg boxes), are explicitly excluded from funding consideration under the Monitoring Program. Projects that provide assessment of these activities, or provide recommendations to conduct enhancement, are eligible for funding under the Monitoring Program (e.g. limnology studies).

Expert judgment - previous relevant experience supported by rationale thought and knowledge.

Federal nexus - a study must have a direct association to a subsistence fishery, and either the fishery or stock in question must occur in waters within or adjacent to Federal lands. The weaker the nexus, the less likely is the funding approval. For example, high seas salmon studies would qualify for funding, however the nexus would be very weak since it would be difficult to show direct effects on Federal subsistence fishery management.

FIS – Fisheries Information Services, in the Office of Subsistence management

Fishery interactions - potential (and usually unintended) consequences of prosecuting a fishery upon another (subsistence) fishery. Potential mechanisms by which a fishery comes into competition with a subsistence fishery include: overlapping time and area resulting in displacement of effort, redirected harvest, and socio-economics factors such as cultural differences.

Freshwater survival - freshwater production, measured as smolt abundance. This term was also discussed in the context of freshwater residency of adults (adult stream life).

Goals - long term achievements that contribute to accomplishing the mission.

Appendix B. continued (Page 2 of 2).

Harvest rate - the exploitation of a run, stock or population usually expressed as the percent of the run, stock or population harvested.

Marine survival - survival from smolt to adult. Estimation of this parameter requires abundance information for both smolt and subsequent adult abundance.

Mission - a responsibility to fulfill.

OSM – Office of Subsistence Management, in the U.S. Fish and Wildlife Service

Salmon stock - a locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics, or an aggregation of two or more interbreeding groups which occur within the same geographic area and is managed as a unit (5AAC 39.222).

TEK – Traditional Ecological Knowledge

TRC – Technical Review Committee

Appendix C-1. Participants in the Southcentral workshop, Anchorage, April 20-22, 2004.

Organization	Name	Phone	E-mail
USFWS, OSM	Doug McBride	786-3633	doug_mcbride@fws.gov
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BIA	Glenn Chen	235-6607	None available
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Note taker	Steve Fried	786-3824	steve_fried@fws.gov

Appendix C-2. Participants in the Southcentral workshop, Anchorage, Nov. 8-9, 2004.

Organization	Name	Phone	E-mail
USFWS, OSM	Doug McBride	786-3633	doug_mcbride@fws.gov
USFWS, OSM	Polly Wheeler	786-3380	polly_wheeler@fws.gov
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Note taker	Amy Craver	786-3875	amy_craver@fws.gov

Appendix C-3. Affiliations and duties of Southcentral workshop participants.

Doug McBride, USFWS/OSM/FIS:
Doug is a fisheries biologist. He is responsible for administering FIS and providing technical oversight over the Monitoring Program in the Southcentral region. Co-chair of the Southcentral workshop.

Polly Wheeler, USFWS/OSM/FIS:
Polly is an anthropologist. She is responsible for administering FIS and providing technical oversight over the Monitoring Program statewide. Co-chair of the Southcentral workshop.

Jerry Berg, USFWS/OSM:
OSM provides support for the Federal subsistence regulatory process; including the inter-agency Staff Committee, Regional Advisory Councils, and the Federal Subsistence Board. Jerry is a fisheries biologist, and is responsible for analysis of regulatory proposals in the Southcentral region.

Pat Petrivelli, USFWS/OSM:
OSM provides support for the Federal subsistence regulatory process; including the inter-agency Staff Committee, Regional Advisory Councils, and the Federal Subsistence Board. Pat is an anthropologist, and is responsible for analysis of regulatory proposals in the Southcentral region.

John Wenburg, USFWS/Region 7 Fisheries Program/Conservation Genetics Lab (CGL):
Provides technical support and expertise, statewide, to restore and maintain fish populations at self-sustaining levels. John is a geneticist, and supervises the Conservation Genetics Lab.

Tim Joyce, USDA Forest Service/Chugach National Forest/Cordova Ranger District:
Monitors and manages multiple uses on the Chugach National Forest, including subsistence uses. Tim is a fisheries biologist and the Federal manager for Chugach National Forest Lands in PWS and the Copper River delta.

Steve Zemke, USDA Forest Service/Chugach National Forest/Regional Office:
USDA FS monitors and manages multiple uses on the Chugach National Forest, including subsistence uses. Steve is a fisheries biologist and the subsistence coordinator for Chugach National Forest Lands in Prince William Sound and the Copper River delta.

Eric Veach, National Park Service/Wrangell-St. Elias National Park and Preserve:
NPS monitors and manages multiple uses on the Wrangell-St.Elias National Park and Preserve, including subsistence uses. Eric is a fisheries biologist and has been the principle investigator on several Monitoring Program projects. He is also the primary advisor to the Wrangell-St. Elias National Park and Preserve Superintendent who is the designated Federal manager for the upper Copper River.

Dave Nelson, National Park Service/Alaska HQ:
NPS monitors and manages multiple uses on the National Park system in Alaska, including subsistence uses. NPS is a principle investigator on several Monitoring Program projects in the Copper River basin. Dave is a fisheries biologist, a senior advisor on subsistence fisheries matters, and serves on the TRC for the Monitoring Program.

Elijah Waters, Bureau of Land Management/Glennallen Field Office:
BLM monitors and manages multiple uses on the Gulkana Wild and Scenic River, including subsistence uses. Elijah is the district fisheries biologist, and is responsible for inventory, monitoring, and resource protection.

Glenn Chen, Bureau of Indian Affairs/Alaska Regional Office, Subsistence Branch:
BIA administers and manages a wide range of functions and services for Alaska Natives, including subsistence uses. Glenn is an Alaska Region Fisheries Biologist, manager of the Subsistence Branch, a senior advisor on subsistence fisheries matter, and serves on the TRC for the Monitoring Program.

Appendix C-3. continued

Jim Edmundson, Alaska Department of Fish and Game/Division of Commercial Fisheries:
ADFG CF monitors and manages commercial and marine personal use and subsistence fisheries statewide. ADFG CF is a principle investigator for a large number of Monitoring Program projects throughout the Southcentral region. Jim is a limnologist and the research supervisor for Cook Inlet, Prince William Sound, and the Copper River basin.

Tom Vania, ADFG/Division of Sport Fisheries:
ADFG SF monitors and manages sport and freshwater personal use and subsistence fisheries statewide. ADFG SF is a principle investigator for a large number of Monitoring Program projects throughout the Southcentral region. Tom is a fisheries biologist and management supervisor for Prince William Sound and the Copper River delta.

Tom Taube, ADFG/Division of Sport Fisheries/Glennallen Area Office:
ADFG SF monitors and manages sport and freshwater personal use and subsistence fisheries statewide. ADFG SF is a principle investigator for a large number of Monitoring Program projects throughout the Southcentral region. Tom is a fisheries biologist and manages sport, subsistence, and personal use fisheries in the Copper River basin.

Matt Miller, ADFG/Division of Sport Fisheries/Anchorage Area Office:
ADFG SF monitors and manages sport and freshwater personal use and subsistence fisheries statewide. ADFG SF is a principle investigator for a large number of Monitoring Program projects throughout the Southcentral region. Matt is a fisheries biologist and manages and researches sport fisheries in Prince William Sound and the Copper River delta.

Bill Simeone, ADFG/Subsistence Division:
ADFG SD monitors and assesses subsistence fisheries statewide. ADFG SD is a principle investigator for a large number of Monitoring Program projects, throughout the Southcentral region. Bill is an anthropologist, and researches subsistence fisheries in the Copper River basin.

Erica McCall, Native Village of Eyak:
The Partners for Fisheries Monitoring Program is funded by OSM, and provides professional-level positions to enhance and build capacity for rural organizations to participate in the Monitoring Program. Erica is an anthropologist and the only Partner for Fisheries Monitoring position in the Southcentral region. NVE is a Federally recognized tribe and provides a wide range of services for their tribal membership. NVE is a principle investigator for several large Monitoring Program projects in the Copper River basin.

Michael Link, LGL Ltd. Environmental Research Associates:
LGL is a private consulting firm specializing and providing expertise in ecosystem research, environmental planning, and resource management. LGL is an investigator for several large Monitoring Program projects in the Copper River basin. Michael is a fisheries biologist, and manager for LGL's Alaska office.

Gloria Stickwan, Southcentral Regional Advisory Council:
The Southcentral Council provides recommendations to the Federal Subsistence Board on regulatory proposals and subsistence issues, as well as advice and comment on Monitoring Program projects. Gloria is a resource consultant with Ahtna Regional Corporation, has worked on several Monitoring Program projects, and serves on the Southcentral Regional Advisory Council.

Tom Carpenter, Southcentral Regional Advisory Council:
The Southcentral Council provides recommendations to the Federal Subsistence Board on regulatory proposals and subsistence issues, as well as advice and comment on Monitoring Program projects. Tom is a commercial fisherman, serves as chairman of the Copper River/Prince William Sound Fish and Game Advisory Committee, and serves on the Southcentral Regional Advisory Council.

Appendix D. Project inventory and gap analysis for the Copper River salmon fishery unit, Southcentral Alaska, 2004.

Appendix D-1. Inventory of projects that address information needs identified in the strategic plan for the Subsistence Fishery Resource Monitoring Plan, Copper River salmon fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Amount Funded 2004	Current Status
1	A	1	Miles Lake Sonar Improvement	ADFG	Miles Lake	Sockeye	Construction of new sonar substrate.	2001	Federal Subsistence FRMP	$0.0	Construction successfully completed.
1	A	1	Copper River Chinook Abundance Estimate	NVE	Baird Canyon, Canyon Creek	Chinook	Inriver run assessed through tagging. Fishwheels utilized to capture and re-sample for mark-recapture estimate. Estimates of abundance, timing, age, sex, length.	2001 - present	Federal Subsistence FRMP	$296.9	Feasibility work in 2001-2002. Reliable estimates since 2003. Funding commitment though 2006.
1	A	1	Inseason Abundance Estimate in Lower Copper River	NVE	Mile 26 Flag Point Channel	Sockeye	Inriver run assessed with sonar and drift gillnets in lower river for index of passage. Estimated indices of passage compared to more complete enumeration of inriver run at Miles Lake sonar.	2001 - present	Federal Subsistence FRMP	$67.7	Feasibility work in 2001-2002. Reliable estimates in 2001 and since 2003. Assessment is mixed species, but predominantly sockeye. Sonar only after 2003. Funding commitment through 2006.
1	A	1	ASL Sampling of Commercial Catch	ADFG	Copper R Commercial Fishery	Sockeye, Chinook	Sample commercial harvest for age, sex, and length composition.	Long term - present	State GF		Biological parameters of commercial harvest credibly measured. Ongoing. Biological parameters of inriver return as assessed at Miles Lake should be directly measured.

1	A	1	Miles Lake Sonar	ADFG	Miles Lake	Sockeye	Inriver run of salmon assessed by sonar. Estimates of abundance and timing. No species apportionment; however, data likely reflect abundance of sockeye as most abundant species.	1980 - Present	State GF		Sonar equipment is dated, R&D to upgrade and replace equipment is underway. Species apportionment and ASL of inriver run should be incorporated into program. Independent verification of abundance should be accomplished. Basic program is ongoing.
1	A	2	Copper River Chinook Radio Telemetry	ADFG	Baird Canyon, upper Copper R drainage	Chinook	Timing and stock composition of inriver run assessed with radio tags. Fish tracked up mainstem and into major spawning tributaries.	1999 - present	Federal Subsistence FRMP	$185.3	Funded by ADFG 1999-2001. Reliable estimates all 6 years. Estimates of abundance likely biased low. Funding expires after 2004.
1	A	2	Copper River Sockeye Radio Telemetry	NVE	Baird Canyon, upper Copper R drainage	Sockeye	Timing and stock composition of inriver run assessed with radio tags. Fish tracked up mainstem into major spawning tributaries.	2005-2007	Federal Subsistence FRMP		Recommended and likely to be funded 2005-2007.
1	A	3	Assessment of Hatchery Releases	ADFG, PWSAC	Crosswind, Paxson, Summit Lakes	Sockeye	Chemical marks on hatchery releases. Copper River commercial and Chitina PU fisheries sampled to est. stocked contribution. Smolt emigration from Paxson L. assessed for size and age composition.	1999 - Present	State GF, PWSAAC		2004 first year of adult sampling for major age classes to estimate contribution. Program ongoing.

1	A	4	Copper River Chinook Genetics	ADFG	Copper River	Chinook	Sample spawning escapements for baselines, test for separation to assess feasibility. Apply to mixed stock samples from inriver run.	2004 - present	Federal Subsistence FRMP	$114.9	In first year of study, still assessing feasibility. Funding commitment through 2006.
1	B	1	Tanada Creek Salmon Escapement	NPS	Tanada Creek	Sockeye	Escapement assessed through weir with backup tagging est. Estimates of abundance, timing, age, sex, length.	2000 - present	Federal Subsistence FRMP	$62.5	Reliable estimates since 2001. Sporadic assessments through weir in past years. Some limnological assessment of Tanada Lake, R&D of video technology. Funding through 2006.
1	B	1	Long Lake Sockeye Escapement	NPS	Long Lake	Sockeye	Escapement assessed through weir. Estimates of abundance, timing, age, sex, length.	1974 - present	Federal Subsistence FRMP	$17.8	Conducted on volunteer basis under ADFG guidance 1974 - 2003. Reliable estimates in all years. Longest escapement database in drainage. Funding commitment through 2006.
1	B	1	Gulkana River chinook enumeration	ADFG/BLM	Gulkana River	Chinook	Chinook escapement assessed via counting tower. In 1996, assessment through a weir. Estimates of abundance and timing.	1996, 2002 - present	ADFG/Federal Aid/BLM	$0.0	Currently a dual funded project by ADF&G and BLM. Ongoing study, minimum through 2006

1	B	1	Upper Copper River chinook & sockeye escapement index	ADFG	Upper Copper River tributaries	Chinook, sockeye	Chinook and sockeye escapement assessed via aerial surveys. Indices of abundance, distribution, and timing.	1963 - present	ADFG	$0.0	Ongoing assessment, chinook conducted by Sport Fish and sockeye by Commercial Fisheries Division. Reliability of surveys unknown due to glacial occlusion.
1	B	2	Copper River Chinook Radio Telemetry	ADFG	Baird Canyon, upper Copper R drainage	Chinook	Timing and stock composition of inriver run assessed with radio tags. Fish tracked up mainstem and into major spawning tributaries.	1999 - present	Federal Subsistence FRMP	$185.3	Funded by ADFG 1999-2001. Reliable estimates of distribution all 6 years. Total estimates of abundance likely biased low. Funding commitment expires after 2004.
1	B	2	Copper River Sockeye Radio Telemetry	NVE	Baird Canyon, upper Copper R drainage	Sockeye	Timing and stock composition of inriver run assessed with radio tags. Fish tracked up mainstem and into major spawning tributaries.	2005-2007	Federal Subsistence FRMP		Recommended and likely to be funded 2005-2007.
1	B	3	An Age Structured Model for Assessment & Management of Copper River Chinook Salmon	ADFG/UAF	Copper River	Chinook	Development of a model to assess and forecast Copper River Chinook salmon using catch-age data.	1999-2001	ADFG	$0.0	Master's Thesis compares four approaches using catch-age data, escapement data, and spawner-recruit data to estimate optimum escapement.
1	B	4	Traditional Knowledge of Long Term Changes in Copper River Salmon Runs	ADFG	Upper Copper River	Sockeye, Chinook	Documentation of historic salmon abundance and distribution as assessed by Ahtna elders.	2004 - present	Federal Subsistence FRMP	$89.9	In first year of study. Funding commitment through 2006.

1	B	4	Summary of harvest, age composition, and escapement for Copper River Chinook , 1969-1998	ADFG	Copper River	Chinook	Historical compilation of Copper River Chinook salmon harvest, age composition, & escapement data from published and unpublished data.	1998	ADFG	$0.0	Project completed. Includes harvest and age composition from commercial, subsistence and personal use, and sport fisheries in the Copper River drainage.
1	C	2	Copper River Chinook coded-wire tag study	ADFG	Copper River	Chinook	Implant coded-wire tags into juvenile chinook salmon of four Upper Copper River stocks to examine exploitation rates in the Copper River District.	1996-2002	ADFG	$0.0	Tags were deployed from 1997-1999, tag recovery occurred in 2001 & 2002 (peak tag return years) with insufficient recovery to meet project objectives.
2	A	1	Upper Copper R Subsistence Permits	ADFG	Upper Copper River	Sockeye, Chinook	Administration of mandatory permit program to participate in Upper Copper R subsistence fisheries.	1960 - present	ADFG		Provides estimates of harvest by species and number of participants.
2	A	1	Mandatory permit system – estimates harvest by species & participants	NPS	Upper Copper River District	salmon	Administration of mandatory subsistence permit system for federally qualified users	2002 - present	NPS		ongoing
2	A	1	The Harvest and Use of Copper River Salmon	ADFG	Copper River Basin	Salmon	Comparison of non-Copper Basin residents' salmon use with residents for gear choice harvest quantities, harvest locations and methods of processing and preserving catch.	1984	ADFG		ADFG Technical Report #96

2	A	1	Update Subsistence Harvest and Use information for Communities of the Copper River Basin	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Household surveys were conducted in 23 communities in Copper R. Basin in 1988. 472 households interviewed on levels of resource harvest and use in 1987-88.	1987-1988	ADFG		ADFG Technical Report #264
2	A	1	Copper Basin Resource Use Map Index and Methodology	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Maps depict areas used between 1964 and 1984 for hunting, fishing and trapping for 20 communities.	1964-1984	ADFG		ADFG Technical Report #124
2	B	1	Increasing GIS Capabilities/GIS Atlas of C&T Subsistence Fish Harvests in Upper Copper River	CRNA	Upper Copper River	Sockeye, Chinook	Developed maps of subsistence harvest locations by gear type for upper Copper River subsistence fishers.	2002-2003	Federal Subsistence FRMP	$0.0	Mixed success in attaining commitment at local level. Project nearing completion, maps and report being internally reviewed.
2	B	1	Patterns and Trends in the Subsistence Salmon Fishery of the Upper Copper River	ADFG	Upper Copper River	Salmon	Data is based on literature review and archival review.	1996	ADFG		Report to the Alaska Board of Fisheries, Cordova, Alaska, December 1996. Anchorage.
2	B	1	Update Subsistence Harvest & Use info for Communities of the Copper River Basin	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Household surveys were conducted in 23 communities in Copper River Basin in 1988. 472 households were interviewed on levels of resource harvest and use in 1987-88.	1987-1988	ADFG		ADFG Technical Report #264

2	B	1	The Dip net and Fish wheel Fisheries of the Copper River	ADFG	Copper River	salmon	Case histories of selected participants describe the differing harvest characteristics between local and non-local participants in dip net and fish wheel fisheries	1982	ADFG		ADFG Technical Report #37
2	B	1	Use of Fish and Game by Communities in Copper River Basin	ADFG	Communities adjacent to the Copper River Basin	Freshwater fish and salmon (and wildlife)	Conducted 431 household surveys in 22 communities and sample areas in and adjacent to the Copper River Basin and Wrangell Mts documenting resource use, history, demography, and economy.	1983	ADFG		ADFG Technical Report #107
2	B	2	Traditional Knowledge of Long Term Changes in Copper River Salmon Runs	ADFG	Upper Copper River	Sockeye, Chinook	Documentation of historic salmon abundance and distribution as assessed by Ahtna elders. Different variables affecting abundance and distribution will be evaluated.	2004 - present	Federal Subsistence FRMP	$89.9	In first year of study. Funding commitment through 2006.

2	B	3	Copper River Subsistence Salmon Fishery Evaluation	ADFG	Upper Copper River	Sockeye, Chinook	Compilation of salmon TEK collected through interviews with select Ahtna elders. Additional component gathered information on the patterns and trends of the subsistence salmon fishery.	2000-2002	Federal Subsistence FRMP	$0.0	Project completed.
3	A	1	Fish Ticket Administration	ADFG	Cordova	All Salmon	Administer fish ticket system to estimate commercial salmon harvest by species.	Long term - present	State GF		Ongoing.
3	A	1	Participation, Catch, and Harvest in Alaska Sport Fisheries	ADFG	Statewide, specific data for Upper Copper River	All sport-caught salmon species	Estimate participation, harvest and catch of sport caught fish species	1977-present	ADFG	$0.0	Ongoing study, estimated annually via mail out survey, one year lag time for data, 2004 data will not be available until 2005
3	A	1	Upper Copper River personal use & subsistence salmon harvest monitoring	ADFG	Copper River	Chinook, sockeye, coho, steelhead	Estimation of personal use and subsistence harvest by species.	1960-present	ADFG	$0.0	Estimation method was simple expansion through 2000, due to change in permitting process, method has factored in non-response bias.
3	B	1	Workshop to Build Capacity among Copper River Groups	CRNA	Copper River	Sockeye, Chinook	Series of facilitated workshops among Copper River stakeholders to discuss assessment of Copper River salmon.	2002-2003	Federal Subsistence FRMP	$0.0	Project completed.

3	B	1	Project reviews of NVE salmon assessment projects.	NVE	Cordova	Sockeye, Chinook	Annual workshops to review results of salmon assessment projects administered by and associated with NVE. Recent reviews have focused on development of Inseason Abundance Estimate in Lower Copper R, Copper R Chinook Abundance Estimate, and Copper R Chinook Radio Telemetry.	2001 - present	Federal Subsistence FRMP		Ongoing.
3	B	1	Statewide Subsistence Fisheries Harvest Monitoring Strategy	ADFG/AITC	Statewide, specific application to Copper River Area	Salmon and some freshwater fish species	Evaluate the different methods used to collect statewide subsistence fisheries information and to design and implement a statewide subsistence fisheries harvest monitoring strategy.	2000	Federal Subsistence FRMP		Project completed. Final report details project methods, and provides a detailed discussion of issues that need to be overcome by any successful harvest monitoring program, as well as a set of principles and recommendations for how harvest assessment programs might be improved.

3	B	1	Implementation of Statewide Harvest Monitoring Strategy	ADFG/AITC	Statewide, specific application to Copper River Area	Salmon	This project was the second phase of an effort to develop a unified subsistence fisheries harvest assessment program in Alaska. Eleven regional workshops were held (one for the Upper Copper River district and one for Cook Inlet/Gulf of Alaska), participants included representatives of tribes, regional advisory councils, advisory committees, and state and federal agencies.	2001-2003	Federal Subsistence FRMP		Project completed, final report available. Workshop participants reviewed existing harvest monitoring programs, and identified action items for potential changes to existing programs. Workshop participants also developed proposals for regulatory changes, and potential studies involving harvest assessment and TEK. Additional project deliverables is annual compilation of statewide subsistence harvest assessment information.
3	B	2	Survey of Permit holders in the Copper River Subsistence Fishery	ADFG	Copper River	salmon	Survey of all permit holders in the Copper River subsistence fishery. Identified criteria on which temporary restrictions could be imposed on subsistence fishery	1979	ADFG		ADFG Technical Report #36

Appendix D-2. Assessment of knowledge and recommendations on course of action for proposals addressing information needs, as stated in the plan framework for the Copper River salmon subsistence fishery unit, Southcentral Alaska, 2004.

GOAL 1 – OBTAIN, DEVELOP, AND IMPROVE INFORMATION TO SUSTAIN FISH POPULATIONS NECESSARY TO PROVIDE FOR SUBSISTENCE USES.

OBJECTIVE 1A: Characterize and define abundance, composition, and timing of salmon populations that sustain subsistence fisheries.

Information Need 1A-1: Estimate or index total run abundance by species.

Summary of Current Situation: *Knowledge is adequate.*

- Salmon assessment programs funded by ADFG and the Monitoring Program focus on assessment of Copper River mainstem abundance and timing of sockeye and Chinook salmon.
- Primary assessment of sockeye salmon inriver run occurs at Miles Lake sonar. Project has been operational since 1970's. Sonar equipment is dated. Sonar data are not apportioned by species; however, sockeye salmon are predominant species and presumed that sonar data most likely reflect abundance and timing of sockeye.
- More timely assessment of sockeye salmon inriver run occurs at Mile 26 Flag Point Channel sonar. Salmon migration is sampled and modeled to index abundance measured at Miles Lake with approximately 1-day lag.
- Assessment of Chinook salmon inriver run occurs at Baird Canyon via tagging study. Methodology fully developed since 2003.

What Needs to be Done: *Consider proposals,* m*aintenance of this data base or activity is required because there is an ongoing need.*

- Maintain or improve current assessment programs for sockeye and Chinook salmon. Funding commitments through Monitoring Program and ADFG are adequate to continue sockeye and chinook assessment programs through 2006.
- Complete research and development of alternate sonar technology at Miles Lake. Assess species apportionment, hatchery contribution, and verify passage estimates at Miles Lake sonar.

Information Need 1A-2: Determine timing and migratory patterns attributable to wild stock sex and age.

Summary of Current Situation: *Knowledge is partially known.*

- Past wild stock identification programs focused on CWT's for select chinook stocks and scale patterns for sockeye stock groupings. Only very limited information applicable to this information need (see 1C-2).
- Estimates of Chinook salmon timing and stock composition via radio tagging since 1999 (six years).
- In 2005, Monitoring Program will fund first year (of three year commitment) of radio tagging study to assess timing and stock composition of sockeye inriver run.
- ASL composition is estimated for commercial and PU fisheries. ASL composition of the PU fishery is considered a reasonable surrogate for that of the subsistence harvest.

What Needs to be Done: *No action,* p*roject(s) to address information need are in place or have been successfully completed.*

- Maintain or improve current assessment program for sockeye salmon. Funding commitments through Monitoring Program are adequate to continue sockeye assessment program through 2007.

Information Need 1A-3: Determine timing and migratory patterns attributable to hatchery stock sex, age.

Summary of Current Situation: *Knowledge is partially known.*

- Chemical marks currently used to mass mark hatchery releases of sockeye. Commercial and Chitina PU fisheries are sampled to estimate stock contribution and timing.
- ASL composition is estimated for commercial and PU fisheries. ASL composition of the PU fishery is considered a reasonable surrogate for that of the subsistence harvest.

What Needs to be Done: *No action, project(s) to address information need are in place or have been successfully completed.*

- Maintain or improve current assessment program for sockeye salmon. Funding is currently outside of Monitoring Program.

Information Need 1A-4: Identify, catalog, and assess stocks.

Summary of Current Situation: *Knowledge is partially known.*

- Work initiated in 2004 to sample and complete chinook genetic baseline. Feasibility of separating mixed stocks will be tested.
- Little information for sockeye.

What Needs to be Done: *Consider proposals for sockeye, there are inadequate projects to address this information need.*

- Maintain or improve current assessment program for Chinook salmon. Funding commitments through Monitoring Program are adequate to continue Chinook assessment program through 2006.
- Initiate sampling to construct genetic baseline for sockeye.

OBJECTIVE 1B: Evaluate spawning escapement needed to sustain subsistence fisheries.

Information Need 1B-1: Obtain reliable estimates of spawning escapement over time and across escapement ranges.

Summary of Current Situation: *Knowledge is partially known.*

- Reliable estimates of sockeye spawning escapement for two minor stocks (Long and Tanada).
- Reliable estimates of chinook spawning escapement for one major stock (Gulkana).
- Time series of aerial surveys for both sockeye and Chinook salmon. Many systems are glacially occluded. Correlation between aerial surveys and tagging estimates of abundance for Chinook (Gulkana) is poor. Similarly, correlation between aerial surveys and weir or tagging estimates of abundance for sockeye (Tanada Creek) are poor.

What Needs to be Done: *No action, projects to address this information need are in place.*

- Maintain or improve systems currently monitored. Funding commitments through Monitoring Program and ADFG are adequate to continue sockeye and Chinook assessment programs through 2006.
- Examine sockeye distribution and timing from radio tagging data (to be completed in 2007). Determine whether other stocks merit consideration of monitoring.
- Further assessment of individual chinook escapements is not necessary for subsistence fishery management pending maintenance of mainstem Chinook salmon abundance program (see 1A-1).

Information Need 1B-2: Estimate distribution of spawning populations.

Summary of Current Situation: *Knowledge is partially known.*

- Estimates of Chinook salmon timing and stock composition via radio tagging since 1999 (six years). This project also addresses 1A-2.
- In 2005, Monitoring Program will fund first year (of three year commitment) of radio tagging study to assess timing and stock composition of sockeye inriver run. This project also directly addresses 1A-2.

What Needs to be Done: *No action, project to address information need for sockeye salmon is in place.*

- Maintain or improve current project to estimate sockeye distribution. Funding commitments through the Monitoring Program are adequate to maintain this program through 2007.

Information Need 1B-3: Describe relationship between escapement and production.

Summary of Current Situation: *Knowledge is partially known.*

- For sockeye salmon, overall spawner-return relationship has been estimated and is the basis for current escapement goal. At question is whether there is differential exploitation by stock due to differences in timing.

- For Chinook salmon, catch-age data were used to model production and is the basis for the current escapement goal. Total return has only recently been estimated, and there are insufficient data to refine the relationship between escapement and production.

What Needs to be Done: *Consider proposals,* m*aintenance of this data base or activity is required because there is an ongoing need.*

- Maintain or improve current radio tagging project to estimate sockeye distribution. Funding commitment through the Monitoring Program is adequate to maintain this program through 2007.
- Maintain or improve current program to estimate Chinook salmon abundance. Funding commitment through the Monitoring Program is adequate to maintain this program through 2006.

Information Need 1B-4: Document historic escapement levels.

Summary of Current Situation: *Knowledge is partially known.*

- Historical summaries of harvest, age composition, and escapement data have been compiled for sockeye and Chinook salmon
- Work has been initiated to document abundance and distribution through TEK. Funding commitment through the Monitoring Program is adequate to maintain this program through 2006.

What Needs to be Done: *Consider proposals, projects to address this information need are not in place.*

- Maintain or improve current project to document TEK of escapement abundance and distribution. Assess utility of this information to assess escapement goals.
- Examine the utility of sediment coring to provide a historic record of sockeye escapements into select systems.

OBJECTIVE 1C: Identify and characterize critical factors that affect population dynamics.

Information Need 1C-1: Evaluate critical attributes of life history affecting production.

Summary of Current Situation: *Knowledge is largely unknown.*

- There are no projects that address this information need specific to the Copper River Drainage.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Assess salmon production as a function of physical and biological factors (e.g. assess juvenile production across a range of spawning escapements).

Information Need 1C-2: Assess impacts of fisheries on stock specific production.

Summary of Current Situation: *Knowledge is partially known.*

- Attempts to address this information need for Chinook with CWT's were unsuccessful. Inadequate numbers of juveniles were CWT'd to provide meaningful numbers of recoveries.
- Information from radio tagging studies in part addresses this information for Chinook and sockeye (see 1A-2).
- Contribution and exploitation of hatchery production to commercial and PU harvests is estimated from sampling of chemically marked fish.

What Needs to be Done: *No action,* p*roject(s) to address information need are in place or have been successfully completed.*

- Maintain or improve current radio tagging assessment program for sockeye salmon. Funding commitments through Monitoring Program are adequate to continue sockeye assessment program through 2007 (see 1A-2).

Information Need 1C-3: Determine effects of hatchery production on wild fish escapement.

Summary of Current Situation: *Knowledge partially known.*

- Hatchery composition (sockeye) is estimated for commercial and PU fisheries. Hatchery composition of the PU fishery is considered a reasonable surrogate for that of the inriver run.

What Needs to be Done: *No action, projects to address this information need are in place.*

- Complete data analysis to assess the contribution of hatchery fish to the inriver run. Reconstruct hatchery and wild inriver run estimates to better assess realized wild stock escapements.

GOAL 2 – ASSESS AND MONITORY SUBSISTENCE FISHERIES TO DOCUMENT AND PROVIDE FOR SUBSISTENCE USES.

OBJECTIVE 2A: Document and estimate subsistence harvest and effort.

Information Need 2A-1: Estimate subsistence harvest by location, gear type, species.

Summary of Current Situation: *Knowledge is adequate.*

- Annual subsistence harvest estimates have been conducted by ADFG Sport Fish Division for Upper Copper River (Glennallen and Chitina) since 1960.
- ADF&G, Division of Subsistence conducted several series of household surveys throughout Copper River basin in 1980s
- ADF&G, Division of Subsistence along with several tribal entities conducted surveys in 2000 among participants in Copper River subsistence salmon fishery (through FIS project 00-040). Data collected included current harvest levels by species, gear type, location of effort; this project also addresses information need 2B-3.

What Needs to be Done: *Consider proposals, maintenance or improvement of this activity is required because there is an ongoing need.*

- Maintain or improve current program to administer permits
- Periodically update baseline household surveys.

Information Need 2A-2: Evaluate quality of harvest data.

Summary of Current Situation: *Knowledge is partially known.*

- No studies have specifically examined to what extent the permit data reflect the total harvest (in the Copper River area), although one FIS funded project (01-107) included discussion of issues surrounding the permit system and how (if) it captured actual harvest. Given recent household surveys in the area, and the existence of annual permit data, a comparison of the two sources of information on subsistence harvests may be possible.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Periodically update household surveys
- Provide funding for pilot study to evaluate village/community based harvest assessment

Information Need 2A-3: Characterize stock structure of the harvest.

Summary of Current Situation: *Knowledge is partially known*

- To date, ASL information has been collected for Chitina PU fishery, which serves as a reasonable surrogate for Glennallen sub-district subsistence harvests.

What Needs to be Done: *No action, project(s) to address information need are in place or have been successfully completed.*

Information Need 2A-4: Assess inseason subsistence harvest and effort.

Summary of Current Situation: *Knowledge is largely unknown*

- Post season harvest information is generally collected through permit data maintained by Division of Sport Fish.
- Implementation of current management plans do not require inseason assessment of subsistence fisheries. Subsistence fisheries managers do not anticipate the need for this information in the next 3-5 years.

What Needs to be Done: *No action.*

OBJECTIVE 2B: Identify and describe past and present subsistence harvest use patterns.

Information Need 2B-1: Describe historic and current methods and means (C&T) by species and area

Summary of Current Situation: *Knowledge is adequate.*

- ADF&G, Division of Subsistence has documented customary and traditional patterns of use of Copper River salmon (one FIS project 00-040 provided significant information on C & T use). This project also addressed information need 2A-1 and 2B-3.

What Needs to be Done: *No action, projects to address this information need have been successfully completed*

Information Need 2B-2: Identify environmental, demographic, regulatory, and socioeconomic factors affecting subsistence harvest levels

Summary of Current Situation: *Knowledge is partially known.*

- One ADF&G Subsistence Division project (1996) began to address this information need.
- In 2004, Monitoring Program funded first year of a study examining long-term trends and sources of variation in the abundance of salmon runs in the Copper River. This project may provide some environmental information to address this need. This project also directly addresses 1B-4.
- In 2005, Monitoring Program is recommending funding a project intended to provide contextual information for understanding Copper River subsistence harvest data by investigating the factors that have influenced subsistence salmon harvests by Federally qualified fishers within the Copper River Basin. This project should provide demographic, regulatory and socioeconomic information to address this need. This project also provides information for 3A-3.
- This information need may be relevant to development of Subsistence Use Amounts-SUAs.

What Needs to be Done: *Consider proposals, there are inadequate project(s) to address this information need.*

- Funding commitments through the Monitoring Program are adequate to maintain this project through 2007.
- Collect qualitative information to understand harvest numbers and develop ways to integrate into management.

Information Need 2B-3: Describe and document current and historic fish processing methods

Summary of Current Situation: *Knowledge is adequate.*

- ADFG, Division of Subsistence has documented customary and traditional harvest and use patterns of Copper River salmon (FIS project 00-040 provided significant information on C and T use). This project also addressed information need 2-A-1 and 2B-3.

What Needs to be Done: *No action, project to address information need have been successfully completed.*

GOAL 3 – DEVELOP AND EVALUATE EFFECTIVE REGULATORY AND MANAGEMENT STRATEGIES TO PROVIDE FOR SUBSISTENCE USES.

OBJECTIVE 3A: Assess impacts of other fisheries on subsistence fisheries.

Information Need 3A-1: Describe total harvest rates by fishery for specific stocks of interest.

Summary of Current Situation: *Knowledge is partially known.*

- Salmon harvest assessment programs funded by ADF&G provide estimates of commercial, sport, personal use, and non-federally qualified subsistence harvests by species and fishery (for subsistence, see 2A-1).
- Total harvest rates (exploitation) by fishery can be computed. At question are harvest rates by stock.
- Radio tagging data provide timing and migratory patterns through inriver fisheries by stock for Chinook and sockeye (see 1A-2).

What Needs to be Done: *Consider proposals, maintenance or improvement of this activity is required because there is an ongoing need.*

- Develop and improve current harvest assessment programs to estimate harvest rates by fishery or stock.
- Specifically assess exploitation of furthest upriver stocks.

Information Need 3A-2: Describe interactions between subsistence and other fisheries.

Summary of Current Situation: *Knowledge is largely unknown.*

- There are no projects that specifically address this information need, although several ADF&G Subsistence Division projects have examined differences between Copper River Basin residents and non-Copper River Basin residents' harvest and use of salmon (also applies to information need 2B-1).

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Describe timing, location, and harvest patterns of subsistence and other fisheries, assess where competition between fisheries may occur.

Information Need 3A-3: Describe socioeconomic impacts of other fisheries.

Summary of Current Situation: *Knowledge is partially known.*

- There are no projects that address this specific information need, although several ADF&G Subsistence Division projects have examined differences between Copper River Basin residents and non-Copper River Basin residents' harvest and use of salmon (also applies to information need 2B-1 and 3A-1).
- In 2005, Monitoring Program is recommending funding a project intended to provide contextual information for understanding Copper River subsistence harvest data by investigating the factors that have influenced subsistence salmon harvests by Federally qualified fishers within the Copper River Basin. This project may provide socioeconomic information to address this need. This project also provides information for 2B-2.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Examine socio-economic factors affecting subsistence (see 2B-2) and other fisheries

OBJECTIVE 3B: Develop and evaluate management strategies for subsistence fisheries.

Information Need 3B-1: Develop information sharing between stakeholders and agencies.

Summary of Current Situation: *Knowledge is partially known.*

- Monitoring project 01-107 began to address issues with subsistence harvest assessment programs through regional workshops. The Southcentral workshop specifically included discussion of issues surrounding the permit system and how (if) it captured actual harvest.
- Series of facilitated workshops among Copper River subsistence stakeholders were completed in 2003. Information sharing focused on salmon assessment programs.
- Annual reviews for NVE assessment projects (see 1A-1 and 1A-2) are ongoing.
- AHTNA Tenenen' Subsistence Committee is facilitating inter-tribal meetings with managers

What Needs to be Done: *Consider proposals, maintenance or improvement of this activity is required because there is an ongoing need.*

- River/region-wide information sharing with subsistence stakeholders on assessment projects and innovations should be periodically updated.
- Recently completed workshops addressed innovations to Chinook salmon assessment. Consider river/region-wide information sharing workshops with subsistence stakeholders upon completion of sockeye assessment projects (see 1A-1 and 1A-2) in 2007.

Information Need 3B-2: Evaluate usefulness and effectiveness of current regulations for subsistence harvests.

Summary of Current Situation: *Knowledge is partially known.*

- No projects have specifically addressed this information need although input from subsistence fishers regarding this information need occurs in part through submission of regulatory proposals.
- ADF&G Subsistence Division provided some discussion of the impacts of fishing regulations on traditional fishing practices

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Evaluate subsistence fishing regulations and compare to subsistence harvest levels and fishing patterns.

Appendix E. Project inventory and gap analysis for the Copper River freshwater species fishery unit, Southcentral Alaska, 2004.

Appendix E-1. Inventory of projects that address information needs identified in the strategic plan for the Subsistence Fishery Resource Monitoring Plan, Copper River freshwater species fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Current Status
1		1	Stock assessment and biological characteristics of burbot in Upper Copper/Upper Susitna drainage lakes	ADFG	Upper Copper/Upper Susitna drainage lakes	burbot	Estimate abundance, length distribution, biological characteristics	1986-present	ADFG	Ongoing study in Tolsona Lake, Lake Louise on 3 year sampling cycle. Sampling has occurred in a variety of lakes in the Upper Copper/Upper Susitna Mgmt Area. Only a few lakes sampled are federal waters (Ptarmigan & Jack lakes (WRST-NPP), American Wellesley, Jatahmund, & Takmahto lakes (Tetlin NWR).
1		1	Evaluation of lake trout stock status & abundance in selected lakes in the Upper Copper/Upper Susitna drainage lakes	ADFG	Upper Copper/Upper Susitna drainage lakes	lake trout	Estimate abundance, length distribution, biological characteristics	1990-1997, 2002-2004	ADFG	Paxson Lake sampling ended in fall 2004. Sampling occurred in three lakes within the Upper Copper/Upper Susitna Mgmt Area (Lake Louise, Paxson and Susitna lakes). None of these lakes are federal waters.
1		1	Harvest and Use of Non-salmon Species in Copper River	ADFG	Upper Copper River	nonsalmon freshwater fish	General compilation of nonsalmon TEK collected through interviews with select Ahtna elders. Some information on nonsalmon species abundance and distribution.	2001-2004	Federal Subsistence FRMP	Project completed, final report under review

1		2	Evaluation of lake trout stock status & abundance in selected lakes in the Upper Copper/Upper Susitna drainage lakes	ADFG	Upper Copper/Upper Susitna drainage lakes	lake trout	Estimate abundance, length distribution, biological characteristics	1990-1997, 2002-2004	ADFG	Paxson Lake sampling ended in fall 2004. Sampling occurred in three lakes within the Upper Copper/Upper Susitna Mgmt Area (Lake Louise, Paxson and Susitna lakes). None of these lakes are federal waters.
2	A	1	Update Subsistence Harvest and Use information for Communities of the Copper River Basin	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Household surveys were conducted in 23 communities in Copper River Basin in 1988. 472 households were interviewed about their levels of resource harvest and use in 1987-88.	1987-1988	ADFG	ADFG Technical Report #264
2	A	1	Harvest and Use of Non-salmon Species in Copper River	ADFG	Upper Copper River	nonsalmon freshwater fish	General compilation of nonsalmon TEK collected through interviews with select Ahtna elders. Some information on nonsalmon species abundance and distribution.	2001-2004	Federal Subsistence FRMP	Project completed, final report under review
2	A	1	Copper Basin Resource Use Map Index and Methodology	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Maps depict areas used between 1964 and 1984 for hunting, fishing and trapping for 20 communities.	1964-1984	ADFG	ADFG Technical Report #124

2	B	1	Harvest and Use of Non-salmon Species in Copper River	ADFG	Upper Copper River	nonsalmon freshwater fish	General compilation of nonsalmon TEK collected through interviews with select Ahtna elders. Additional component gathered information on the patterns and trends of the subsistence fishery.	2001-2004	Federal Subsistence FRMP	Project completed, final report under review
2	B	1	Increasing GIS Capabilities/GIS Atlas of C&T Subsistence Fish Harvests in Upper Copper River	CRNA	Upper Copper River	nonsalmon freshwater fish	Developed maps of subsistence harvest locations by gear type for upper Copper River subsistence fishers.	2001-2004	Federal Subsistence FRMP	Project nearing completion, maps and report being internally reviewed.
2	B	1	Update Subsistence Harvest and Use information for Communities of the Copper River Basin	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Household surveys were conducted in 23 communities in Copper River Basin in 1988. 472 households were interviewed about their levels of resource harvest and use in 1987-88.	1987-1988	ADFG	ADFG Technical Report #264
2	B	1	Use of Fish and Game by Communities in Copper River Basin	ADFG	Communities adjacent to the Copper River Basin	Freshwater fish and salmon (and wildlife)	Conducted 431 household surveys in 22 communities and sample areas in and adjacent to the Copper River Basin and Wrangell Mts documenting resource use, history, demography, and economy.	1983	ADFG	ADFG Technical Report #107

2	B	1	Inventory of Freshwater Fish Populations within Wrangell-St. Elias National Park/Preserve	NPS	Upper Copper River--East side	all freshwater fish	Sampled lakes and streams to supplement our existing knowledge of freshwater fish presence within the Park/Preserve	2001-2004	NPS Natural Resource Challenge funds	Final report completed
2	B	1	Population assessment of burbot in Long Lake (Lakina R drainage	NPS/ADFG	Long Lake along the McCarthy Road	burbot	Use hoop traps to capture and mark burbot in Long Lake	2004-?	NPS Subsistence Fishery Funds/ADFG operating funds	Data collection initiated
2	B	2	Harvest and Use of Non-salmon Species in Copper River	ADFG	Upper Copper River	nonsalmon freshwater fish	General compilation of nonsalmon TEK collected through interviews with select Ahtna elders. Additional component gathered information on the patterns and trends of the subsistence fishery.	2001-2004	Federal Subsistence FRMP	Project completed, final report under review
2	B	3	Update Subsistence Harvest and Use information for Communities of the Copper River Basin	ADFG	Copper River Basin	Freshwater fish and salmon (and wildlife)	Household surveys were conducted in 23 communities in Copper River Basin in 1988. 472 households were interviewed about their levels of resource harvest and use in 1987-88.	1987-1988	ADFG	ADFG Technical Report #264

2	B	3	Use of Fish and Game by Communities in Copper River Basin	ADFG	Communities adjacent to the Copper River Basin	Freshwater fish and salmon (and wildlife)	Conducted 431 household surveys in 22 communities and sample areas in and adjacent to the Copper River Basin and Wrangell Mts documenting resource use, history, demography, and economy.	1983	ADFG	ADFG Technical Report #107
2	B	4	Harvest and Use of Non-salmon Species in Copper River	ADFG	Upper Copper River	nonsalmon freshwater fish	General compilation of nonsalmon TEK collected through interviews with select Ahtna elders. Additional component gathered information on the patterns and trends of the subsistence fishery.	2001-2004	Federal Subsistence FRMP	Project completed, final report under review
3	B	1	Participation, Catch, and Harvest in Alaska Sport Fisheries	ADFG	Statewide, specific data for Upper Copper River	all sport-caught freshwater species	Estimate participation, harvest and catch of sport caught fish species	1977-present	ADFG	Ongoing study, estimated annually via mail out survey, one year lag time for data, 2004 data will not be available until 2005
3	B	1	Statewide Subsistence Fisheries Harvest Monitoring Strategy	ADFG/AITC	Statewide, specific application to Copper River Area	salmon and some freshwater fish species	Evaluate the different methods used to collect statewide subsistence fisheries information and to design and implement a statewide subsistence fisheries harvest monitoring strategy.	2000	Federal Subsistence FRMP	Project completed. Final report details project methods, and provides a detailed discussion of issues that need to be overcome by any successful harvest monitoring program, as well as a set of recommendations for how harvest assessment programs might be improved.

3	B	1	Implementation of Statewide Harvest Monitoring Strategy	ADFG/AITC	Statewide, specific application to Copper River Area	salmon	This project was the second phase of an effort to develop a unified subsistence fisheries harvest assessment program in Alaska. Eleven regional workshops were held (one for the Upper Copper River district and one for Cook Inlet/Gulf of Alaska), participants included representatives of tribes, regional advisory councils, advisory committees, and state and federal agencies.	2001-2003	Federal Subsistence FRMP	Project completed, final report available. Workshop participants reviewed existing harvest monitoring programs, and identified action items for potential changes to existing programs. Workshop participants also developed proposals for regulatory changes, and potential studies involving harvest assessment and TEK. Additional project deliverables is annual compilation of statewide subsistence harvest assessment information.
3	B	1	A workshop series to build capacity for co-management on the Copper River	CRNA/LGL	Copper River Basin	salmon and some freshwater fish species	The goal of this project was to facilitate information sharing between subsistence users along the Copper River, and to provide opportunities for learning about co-management of fisheries in other areas	2001-2003	Federal Subsistence FRMP	Project completed; final report details methods and findings of projects

Appendix E-2. Assessment of knowledge and recommendations on course of action for proposals addressing information needs, as stated in the plan framework for the Copper River freshwater species subsistence fishery unit, Southcentral Alaska, 2004.

GOAL 1 – OBTAIN, DEVELOP, AND IMPROVE INFORMATION TO SUSTAIN FISH POPULATIONS NECESSARY TO PROVIDE FOR SUBSISTENCE USES.

Information Need 1-1: Estimate or index total abundance and composition by species.

Summary of Current Situation: *Knowledge is partially known.*

- Research conducted by ADFG for other Copper R lake populations of lake trout and burbot provide methodology to index or assess abundance.
- Preliminary population assessment conducted at Long Lake in 2004 indicates very few burbot.
- Database of previously sampled lakes by NPS and site-specific subsistence harvest data provide lakes to be assessed along McCarthy and Nebesna roads.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Estimate or index total abundance.
- Estimate age and length composition.

Information Need 1-2: Evaluate spawning abundance needed to sustain subsistence fisheries..

Summary of Current Situation: *Knowledge is unknown.*

- Research conducted by ADFG for other Copper R lake populations of lake trout and burbot provide methodology to index or assess abundance.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Estimate fall spawning populations of lake trout.

Information Need 1-3: Identify and characterize critical factors affecting population dynamics.

Summary of Current Situation: *Knowledge is partially known.*

- Significant database of information available from literature regarding environmental factors that affect survival.
- Site-specific measurements for lakes of interest are lacking.

What Needs to be Done: *No action, project(s) to address information need are in place or have been successfully completed.*

- Site-specific measurements should be included in proposals that address 1-1 and 1-2.

Information Need 1A-4: Document historic distribution and abundance levels.

Summary of Current Situation: *Knowledge is partially known.*

- There are no projects that address this information need.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Conduct TEK studies to assess historic fishing locations.
- Conduct data search of historic lake inventory records.

GOAL 2 – ASSESS AND MONITOR SUBSISTENCE FISHERIES TO DOCUMENT AND PROVIDE FOR SUBSISTENCE USES.

OBJECTIVE 2A: Document and estimate subsistence harvest and effort.

Information Need 2A-1. Estimate subsistence harvest by location, gear type and species

Summary of Current Situation: *Knowledge is adequate.*

- ADF&G, Division of Subsistence has documented harvest and use of Copper River freshwater fish beginning in the early 1980s. Also, FIS project 01-110 provided information on current harvest of non-salmon fish.

What Needs to be Done: *No action, projects to address this information need (for the next 3-5 years) have been successfully completed.*

- Harvest assessment studies, specifically focusing on federal waters, should be periodically conducted. Given that FIS project 01-110 recently conducted a study on nonsalmon fish that included a harvest assessment component, the need for another project focusing on this information need within the next 3-5 years is negligible.

Information Need 2A-2: Characterize stock structure of the harvest.

Summary of Current Situation: *Knowledge is largely unknown*

What Needs to be Done: *No action at this time.*

Information Need 2A-3: Evaluate quality of harvest data.

Summary of Current Situation: *Knowledge is largely unknown*

What Needs to be Done: *No action at this time.*

OBJECTIVE 2B: Identify and describe past and present subsistence harvest use patterns.

Information Need 2B-1: Describe historic methods and means (C&T) by species and area

Summary of Current Situation: *Knowledge is adequate.*

- ADF&G, Division of Subsistence has documented historic customary and traditional patterns of use of Copper River freshwater fish beginning in the early 1980s. Also, FIS project 01-110 provided significant information on C and T use.

What Needs to be Done: *No action, projects to address this information need (for next 3-5 years) have been successfully completed.*

Information Need 2B-2: Describe current methods and means (C&T) by species and area

Summary of Current Situation: *Knowledge is adequate.*

- FIS project 01-110 provided significant information on current C and T use.

What Needs to be Done: *No action, projects to address this information need (for next 3-5 years) have been successfully completed.*

- When a study is done, it should focus specifically on current practices as they occur on federal waters

Information Need 2B-3: Describe and document historic and current processes and distribution practices.

Summary of Current Situation: *Knowledge is partially known.*

- ADF&G Division of Subsistence baseline surveys have addressed historic processes and distribution practices. Also, FIS project 01-110 provided limited information on processes and distribution practices.

What Needs to be Done: No *action, projects to address this information need (for next 3-5 years) have been successfully completed.*

- When a study is done, it should focus specifically on current practices as they occur on federal waters

Information Need 2B-4: Identify environmental, demographic, regulatory, and socioeconomic factors affecting subsistence harvest levels

Summary of Current Situation: *Knowledge is partially known.*

- FIS project 01-110 provided limited information on changes affecting non salmon harvests over time.
- This information need may be relevant to development of Subsistence Use Amounts – [SUAs], depending on the outcome of the State-Federal Subsistence Use Amounts protocol group.

What Needs to be Done: *Consider proposals, there are inadequate project(s) to address this information need.*

- Proposals could be considered that investigate reasons for changing harvest patterns; possibly link to understanding changing salmon harvest patterns.

GOAL 3 – DEVELOP AND EVALUATE EFFECTIVE REGULATORY AND MANAGEMENT STRATEGIES TO PROVIDE FOR SUBSISTENCE USES.

OBJECTIVE 3A: Develop and evaluate management strategies for subsistence fisheries.

Information Need 3A-1: Evaluate usefulness and effectiveness of current regulations for subsistence harvests

Summary of Current Situation: *Knowledge is unknown.*

- There are no projects that specifically address this information need, although there are minimal regulations at this point in time.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Examine regulatory needs for stock rebuilding as needed (e.g., possible high harvests because of unknown stock abundance on lakes off of McCarthy Road (see 1A-1).

Information Need 3A-2: Develop information sharing between stakeholders and agencies

Summary of Current Situation: *Knowledge is partially known.*

- There are no projects that specifically address this information need for freshwater fish. However, project 01-107 partially addressed information sharing between stakeholders (although that project was specifically focused on subsistence salmon). Also, FIS project 01-217 (Workshop Series to build capacity for co-management of fish on Copper river) also provided for information sharing between stakeholders and some agency personnel.

What Needs to be Done: *Consider proposals, there are inadequate projects to address this information need.*

- Consider ways to enhance information sharing

OBJECTIVE 3B: Assess impacts of other fisheries on subsistence fisheries

Information Need 3B-1: Describe relationship between sport and subsistence fisheries for specific stocks on federal public waters (e.g., Tanada Lake, Gulkana R.)

Summary of Current Situation: *Knowledge is largely unknown.*

What Needs to be Done: *Consider proposals, maintenance or improvement of this activity is required because there is an ongoing need.*

- Consider proposals to estimate sport fishery harvest by species and location
- Evaluate this information with similar information for subsistence fishers

Information Need 3B-2: Describe socioeconomic impacts of other fisheries

Summary of Current Situation: *Knowledge is unknown.*

- No projects have specifically addressed this information need – and unsure if this is an information until 3B-1 is evaluated.

What Needs to be Done: *No action at this time.*

Appendix F. Project inventory for the Prince William Sound-Delta salmon fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Current Status
1	B	1	Coghill Coho Weir	ADFG	Coghill Lake	Coho	Extended weir for sockeye to assess coho escapement. Estimated total abundance, ASL composition, migratory timing.	2000 - 2002	Federal Subsistence FRMP	High water compromised weir. One unbiased estimate of escapement through mark-recapture. Escapement estimated in low thousands. Without weir modification, not a viable method to assess coho escapement in the future.
1	B	1	Stock Assessment of Salmon in Billy's Hole, PWS	ADFG	Billy's Hole Lake	Sockeye	Assess sockeye escapement through weir. Estimated total abundance, ASL composition, migratory timing. Assessed subsistence and sport effort and harvest.	2003 - present	Federal Subsistence FRMP	Project in second and final year. Escapement successfully assessed in low thousands. Directed sport and subsistence effort very low.
1	B	1	Solf Lake	USFS	Western Prince William Sound - Knight Island	Sockeye	Assess recently stocked population using a modified weir	2002-present	USFS	Returns of sockeye began in 2003 with a few hundred counted. Stocking is continuing.
1	B	1	Coghill Sockeye Weir	ADFG	Coghill Lake	Sockeye	Annually estimate sockeye escapement through a weir. Estimated total abundance, ASL composition, migratory timing.	Long term - present	State GF	Weir data reliable for estimating escapement. Ongoing.

1	B	1	Eshamy Sockeye Weir	ADFG	Eshamy Lake	Sockeye	Annually estimate sockeye escapement through a weir. Estimated total abundance, ASL composition, migratory timing.	Long term - present	State GF	Weir data reliable for estimating escapement. Ongoing.
1	B	1	Salmon Aerial Surveys	ADFG	Many systems throughout PWS and Delta	PWS: coho, pink, chum. Delta: sockeye, coho.	Annually index escapement through one or more aerial surveys.	Long term - present	State GF	Some verification of survey results, particularly for pink salmon. Survey data likely sufficiently accurate for most subsistence management applications, particularly in PWS. Possible need to verify survey results for select Delta coho stocks.
1	B	1	ASL Sampling of Commercial Catch	ADFG	Copper R Commercial Fishery	Sockeye, Coho	Sample commercial harvest for age, sex, and length composition.	Long term - present	State GF	Biological parameters of commercial harvest credibly measured. Ongoing.
1	B	1	ASL Sampling of Delta Sockeye Escapement	ADFG	Select Copper R Delta Systems	Sockeye	Sample select stocks to estimate age, sex, length composition.	Long term - present	State GF	Biological parameters of select escapements credibly measured. Ongoing.
1	B	1	Escapement counts of Mile 18 - coho salmon	USFS	Mile 18 tributary to the Alaganik River. Copper River Delta	Coho	Stream walking surveys getting an index count of coho salmon escapement.	1995 - present	USFS	On going annual event
1	B	1	Escapement counts and fish ladder maintenance of 5 PWS streams	USFS	PWS	Sockeye	maintaining fish passes and stream walking system for escapement count index	1980's to present	USFS	On going annual event

1	B	3	Index counts of salmon at enhanced fish passage sites	USFS	Western Prince William Sound	Coho, Pink, Chum, Sockeye	Index counts conducted above fish passage projects to verify passage modifications are effective	1995-present	USFS	Data collected intermittently - counts only valid as a minimum escapement - counts not conducted for population assessment
2	A	1	Copper R Delta/PWS Subsistence Permits	ADFG	Upper Copper River	Sockeye, Chinook	Administration of mandatory permit program to participate in Copper R Delta and PWS subsistence fisheries.	1960 - present	ADFG	Provides estimates of harvest by species and number of participants.
2	A	1	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG	ADFG Technical Report #153
2	A	1	Cordova: A 1988 Update on Resource Harvest and Uses	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	A resource use survey was administered to approximately 100 households	1988	ADFG	ADFG Technical Report #204
2	A	1	Status of subsistence uses in Exxon Valdez Oil Spill Area Communities	ADFG	Prince William Sound, Kodiak Island, Alaska Peninsula and Cook Inlet Communities.	Freshwater fish and salmon (and wildlife)	Provide updated information on subsistence harvests and uses in the Exxon Valdez oil spill area.	2003	EVOS	Study completed ADFG Technical report #199

2	B	1	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG	ADFG Technical Report #153
2	B	1	Resource Use Patterns in Chenega in 1960s and 1984-1986	ADFG	Prince William Sound/Chenega Bay	Freshwater fish and salmon (and wildlife)	Surveys documented patterns of resource use in early 1960s at Chenega and compared harvest patterns with newly resettled populations at Chenega Bay in 1984-86.	1960; 1984-1986	ADFG	ADFG Technical Report #139
2	B	1	Resource Harvest and Use in Tatitlek	ADFG	Prince William Sound/Tatitlek	Freshwater fish and salmon (and wildlife)	Two annual harvest surveys were conducted with experienced fishers and hunters documenting past and present resource harvesting activities.	1987-1988	ADFG	ADFG Technical Report #181

2	B	2	Subsistence Harvests and Uses in 7 Gulf of Alaska Communities	ADFG	Prince William Sound /Tatitlik, Chenega Bay, Nanwalek, Port Graham, Ouzinkie, Larsen Bay, and Karluk	Freshwater fish and salmon (and wildlife)	Surveys documented that one year after the Exxon spill, subsistence harvests remained well below pre-spill levels in some communities	1991	EVOS	ADFG Technical Report #218
2	B	2	Long-Term Consequences of the Exxon Valdez Oil Spill for Coastal Communities of South Central Alaska	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)	Study documented long term impacts of Exxon Valdez oil spill on subsistence uses by residents of PWS communities. Demonstrates how human communities responded to the spill. The findings indicate that most families actively adapted to the industrial disaster in ways that protected the well-being of family members.	2001	EVOS	ADFG Technical Report #264
2	B	2	Subsistence Harvest Uses in 8 Communities 10 years after the Exxon Valdez Oil Spill	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)	Update status of subsistence uses of fish and wildlife resources in area affected by Exxon Valdez oil spill	1999	EVOS	ADF&G Technical Report # 252

2	B	2	Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in AK.	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)		1995	MMS	MMS Technical Report #16
2	B	2	Subsistence Harvest and Uses in Two communities in the Year following the Exxon Valdez oil spill	ADFG	Prince William Sound/Chenega Bay and Tatitlek	Freshwater fish and salmon (and wildlife)	Effects of the oil spill on the harvesting and uses of all subsistence resources.	1995	EVOS	Study completed ADFG Technical report #199
2	B	2	Status of subsistence uses in Exxon Valdez Oil Spill Area Communities	ADFG	Prince William Sound, Kodiak Island, Alaska Peninsula and Cook Inlet Communities.	Freshwater fish and salmon (and wildlife)	Provide updated information on subsistence harvests and uses in the Exxon Valdez oil spill area.	2003	EVOS	Study completed ADFG Technical report #199
2	B	3	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG	ADFG Technical Report #153

2	B	3	Resource Use Patterns in Chenega in 1960s and 1984-1986	ADFG	Prince William Sound/Chenega Bay	Freshwater fish and salmon (and wildlife)	Surveys documented patterns of resource use in early 1960s at Chenega and compared harvest patterns with newly resettled populations at Chenega Bay in 1984-86.	1960; 1984-1986	ADFG	ADFG Technical Report #139
2	B	3	Resource Harvest and Use in Tatitlek	ADFG	Prince William Sound/Tatitlek	Freshwater fish and salmon (and wildlife)	Two annual harvest surveys were conducted with experienced fishers and hunters documenting past and present resource harvesting activities.	1987-1988	ADFG	ADFG Technical Report #181
3	A	1	Fish Ticket Administration	ADFG	Cordova	All Salmon	Administer fish ticket system to estimate commercial salmon harvest by species.	Long term - present	State GF	Ongoing.

Appendix G. Project inventory for the Copper River rainbow/steelhead fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Current Status
1	B	1	Stock Status of Copper River Steelhead	ADFG	Upper Gulkana, Hanagita Rivers	Steelhead	Abundance, composition, and timing of largest known spawning populations. Assessment through weirs and tagging experiments. Genetic sampling to assess stock structure.	2001 - 2003	Federal Subsistence FRMP	Spawning populations credibly estimated at several hundred fish. Spawning populations are genetically distinct. Project completed.
1	C	2	Participation, Catch, and Harvest in Alaska Sport Fisheries	ADFG	Statewide, specific data for Upper Copper River	all sport-caught steelhead	Estimate participation, harvest and catch of sport caught fish species	1977-present	ADFG	Ongoing study, estimated annually via mail out survey, one year lag time for data, 2004 data will not be available until 2005
2	A	2	Copper River Steelhead Harvest Monitoring	NPS	Glennallen Subdistrict	Steelhead	Assess effort and harvest for early (May) subsistence season. Aerial surveys to estimate subsistence fishwheel effort, test fishery to assess species composition of harvest.	2001 - 2003	Federal Subsistence FRMP	Steelhead bycatch very low, although equal to directed harvest of sockeye in one year. Subsistence harvest in May commensurate with low estimates of spawning abundance in Upper Gulkana and Hanagita rivers. Project completed.

Appendix H. Project inventory for the Copper River eulachon fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Current Status
1	A	1	Eulachon Test Fishery	ADFG	Copper River Delta	Eulachon	Administer commercial test fishery to index total abundance	Sporadic	State Test Fish Fund	Test fishery conducted when there is commercial interest. Exploitation is unknown, so reliability of results is at question.
1	B	2	Effects of Salinity on Hatching Success	USDA FS	Lab Experiments	Eulachon	Test effects of salinity on hatching success. At question is identification of spawning habitat whether there may be viable inter-tidal spawning.	2004-2005	Federal Subsistence FRMP	Study in progress.
2	A	2	Eulachon Subsistence Harvest Opportunities	NVE	Copper River Delta	Eulachon	Harvest survey to estimate effort, harvest, timing, and specific location of harvest. Comparison of contemporary and historic (dated surveys) harvest levels.	2002-2003	Federal Subsistence FRMP	Eulachon harvest low, timing and location of harvest varies in response to migratory patterns. Project completed.

Appendix I. Project inventory for the Prince William Sound-delta freshwater species fishery unit, Southcentral Alaska, 2004.

Goal	Objec-tive	Info Need	Title of Project	Lead Agency/ Organization	Location of Project	Species Addressed	Primary Activity	Duration	Funding Source	Amount Funded 2004	Current Status
1	A	1	Impact of Oil Spilled from the Exxon Valdez on Survival and growth of Dolly Varden and Cutthroat trout in Prince William Sound, Alaska	ADF&G	PWS	cutthroat trout, and Dolly Varden	Measure survival and growth rates of cutthroat trout and Dolly Varden in control and oiled areas in PWS	1989-1991	EVOS		report published in 1993: Hepler et al
1	A	1	Relations Between Dolly Varden Populations and Between Coastal Cutthroat trout Populations and in PWS	USFS (?)	PWS and Copper River Delta	cutthroat trout, and Dolly Varden	determine genetic structure of Dolly Varden and cutthroat trout populations in PWS	1995	EVOS		report published in 2000, Griswold et al
1	A	2	Distribution of Salmonids in PWS	USFS	Western Prince William Sound	Cutthroat trout, Dolly Varden, Coho	Determine the distribution of fish in streams where no data exists	1998-present	USFS	$25.0	In progress

1	A	2	Copper River Delta Trout Assessment Project	ADF&G	Martin River drainage	cutthroat, rainbow, steelhead and hybrid trout	collect age and length data on trout stocks in the CRD, floy-tag trout to assess movement within drainage and use along the Carbon Mountain corridor, radio tag trout to identify spawning streams along road corridor,	2000-2005	ADF&G	$67.8	collection of age and length data, and floy tagging completed in 2004. Radio tags deployed in 2004 and spring 2005 to identify spawning habitat. Project funded through AK FY05
2	A	1	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG		ADFG Technical Report #153
2	A	1	Cordova: A 1988 Update on Resource Harvest and Uses	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	A resource use survey was administered to approximately 100 households	1988	ADFG		ADFG Technical Report #204

2	A	1	Status of subsistence uses in Exxon Valdez Oil Spill Area Communities	ADFG	Prince William Sound, Kodiak Island, Alaska Peninsula and Cook Inlet Communities.	Freshwater fish and salmon (and wildlife)	Provide updated information on subsistence harvests and uses in the Exxon Valdez oil spill area.	2003	EVOS		Study completed ADFG Technical report #199
2	B	1	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG		ADFG Technical Report #153
2	B	1	Resource Use Patterns in Chenega in 1960s and 1984-1986	ADFG	Prince William Sound/Chenega Bay	Freshwater fish and salmon (and wildlife)	Surveys documented patterns of resource use in early 1960s at Chenega and compared harvest patterns with newly resettled populations at Chenega Bay in 1984-86.	1960; 1984-1986	ADFG		ADFG Technical Report #139
2	B	1	Resource Harvest and Use in Tatitlek	ADFG	Prince William Sound/Tatitlek	Freshwater fish and salmon (and wildlife)	Two annual harvest surveys were conducted with experienced fishers and hunters documenting past and present resource harvesting activities.	1987-1988	ADFG		ADFG Technical Report #181

2	B	2	Subsistence Harvests and Uses in 7 Gulf of Alaska Communities	ADFG	Prince William Sound /Tatitlik, Chenega Bay, Nanwalek, Port Graham, Ouzinkie, Larsen Bay, and Karluk	Freshwater fish and salmon (and wildlife)	Surveys documented that one year after the Exxon spill, subsistence harvests remained well below pre-spill levels in some communities	1991	EVOS		ADFG Technical Report #218
2	B	2	Long-Term Consequences of the Exxon Valdez Oil Spill for Coastal Communities of South Central Alaska	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)	Study documented long term impacts of Exxon Valdez oil spill on subsistence uses by residents of PWS communities. Demonstrates how human communities responded to the spill. The findings indicate that most families actively adapted to the industrial disaster in ways that protected the well-being of family members.	2001	EVOS		ADFG Technical Report #264
2	B	2	Subsistence Harvest Uses in 8 Communities 10 years after the Exxon Valdez Oil Spill	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)	Update status of subsistence uses of fish and wildlife resources in area affected by Exxon Valdez oil spill	1999	EVOS		ADF&G Technical Report # 252

2	B	2	Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in AK.	ADFG	Prince William Sound	Freshwater fish and salmon (and wildlife)	1995		MMS		MMS Technical Report #16
2	B	2	Subsistence Harvest and Uses in Two communities in the Year following the Exxon Valdez oil spill	ADFG	Prince William Sound/Chenega Bay and Tatitlek	Freshwater fish and salmon (and wildlife)	Effects of the oil spill on the harvesting and uses of all subsistence resources.	1995	EVOS		Study completed ADFG Technical report #199
2	B	2	Status of subsistence uses in Exxon Valdez Oil Spill Area Communities	ADFG	Prince William Sound, Kodiak Island, Alaska Peninsula and Cook Inlet Communities.	Freshwater fish and salmon (and wildlife)	Provide updated information on subsistence harvests and uses in the Exxon Valdez oil spill area.	2003	EVOS		Study completed ADFG Technical report #199
2	B	3	Resource Uses in Cordova	ADFG	Prince William Sound/Cordova	Freshwater fish and salmon (and wildlife)	Conducted household surveys and key respondent surveys in 24% of Cordova's households documenting participation in resource harvesting, levels of harvest and use, sharing patterns, and harvesting activities	1984-1989	ADFG		ADFG Technical Report #153

2	B	3	Resource Use Patterns in Chenega in 1960s and 1984-1986	ADFG	Prince William Sound/Chenega Bay	Freshwater fish and salmon (and wildlife)	Surveys documented patterns of resource use in early 1960s at Chenega and compared harvest patterns with newly resettled populations at Chenega Bay in 1984-86.	1960; 1984-1986	ADFG		ADFG Technical Report #139
2	B	3	Resource Harvest and Use in Tatitlek	ADFG	Prince William Sound/Tatitlek	Freshwater fish and salmon (and wildlife)	Two annual harvest surveys were conducted with experienced fishers and hunters documenting past and present resource harvesting activities.	1987-1988	ADFG		ADFG Technical Report #181