Strategic Plan for the Subsistence Fisheries Resource Monitoring Program, Kodiak-Aleutians Area, 2006

Developed by the

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PREFACE

A strategic planning process was initiated for the Kodiak-Aleutians Area of the Southwest Region in November 2005 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 process involved State and Federal managers, scientists, Kodiak-Aleutians Subsistence Regional Advisory Council (Council) members, and other stakeholder groups.

Strategic planning occurred in three phases:

1. Identification of salmon and non-salmon subsistence fishery units within the Kodiak-Aleutians area;
2. Development of a framework of goals, objectives, and information needs for each subsistence fisheries unit; and
3. Prioritization of frameworks to obtain ranked lists of information needs for each fishery unit.

Elements of the framework were considered in the context of enabling legislation, Section 812 of Alaska National Interest Lands Conservation Act[1] (ANILCA), and Federal Subsistence Board (Board) guidelines. Consistent with ANILCA, the workgroup only included information needs that had relevance to management of subsistence fisheries on or associated with Federal public lands.

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 (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, wildlife and 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.

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

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 studies have been funded through the Monitoring Program in support of Federal subsistence fisheries management. From 2000 to 2003, strategic priorities for the Monitoring Program were identified through the Councils as issues and information needs (OSM 2004). These issues and information needs were used to guide solicitation and evaluation of study proposals. While this process provided a valuable public forum for a wide range of staff and public recommendations regarding informational needs for the Monitoring Program, it was difficult to determine the highest priority information needs for a 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 Division (FIS) is undertaking a planning process for each region. Participants in the process are invited from Federal agencies, the Alaska Department of Fish and Game (ADFG), academia, and Alaska Native, rural and other organizations. Council representation was also sought to effectively transition from issues and information needs already developed through the Councils, as well as to provide valuable local perspective. These participants participate in facilitated workshops during which they develop prioritized program goals, research objectives, and information needs. The resulting report and strategic plan then undergo public review through the appropriate Council.

In 2004, the strategic planning process was first applied to the Prince William Sound Management Area, which included the Copper River drainage, of the Southcentral Region, and Bristol Bay-Chignik areas of the Southwest Region. During 2005-2006, a similar process was applied to developing strategic plans for the Southeast Alaska Region and the Kodiak-Aleutians areas of the Southwest Region. The purpose of this report is to describe and present the draft framework and prioritized information needs developed through Kodiak-Aleutians area workshops.

APPLICATION OF STRATEGIC PLANNING

The strategic plan will be used to: (1) clarify requests for proposals; and (2) define the evaluation criteria for strategic priorities. Clarification of strategic priorities for 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 process, including evaluation criteria (technical merit, administrative expertise, and capacity building described below under *Study Evaluation Process*), will remain in place. However, the role of funding guidelines for the two recognized data types (stock status and trends; and harvest monitoring and traditional ecological knowledge; described below under *Policy and Funding Guidelines*) will likely diminish over time as the Monitoring Program evolves to address the highest priority information needs regardless of data type.

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

Study Evaluation Process

The Monitoring Program is implemented through a collaborative approach involving five Federal agencies (U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and U.S. 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 study 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 (Appendix B). 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 (Appendix C). This means, 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:

   a. Conservation Mandate - Risk to the conservation of species and populations that support subsistence fisheries and risk to conservation unit purposes.

   b. Allocation Priority - Risk of failure to provide a priority to subsistence uses and risk that subsistence harvest needs will not be met.

   c. Data Gaps - Amount of information available to support subsistence management. A higher priority is given where a lack of information exists.

d. 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).

e. Local Concern - Level of user concern over subsistence harvests (e.g. allocation, competing uses, and 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. Investigator Ability and Resources

Investigators must show they are capable of successfully completing the proposed study by providing information on the ability (training, education, and experience) and resources (technical and administrative) they possess to conduct the work. Applicants having received funding in the past will be evaluated and ranked on their past performance, including fulfillment of meeting deliverable deadlines.

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 studies:

- A minimum of 60% of Monitoring Program annual funding is dedicated to non-Federal sources.

- Activities not eligible for funding under the Monitoring Program include: a) hatchery propagation, restoration, enhancement, and supplementation; b) habitat protection, restoration, and enhancement; and c) contaminant assessment, evaluation, and monitoring. The rationale behind this policy guideline is to ensure that existing responsibilities and efforts by government agencies were not duplicated under the Monitoring program. Land management 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; fish stocking; enhancement of spawning or rearing habitats; and 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 studies that

assess whether migratory barriers, such as falls and 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 studies) and new study starts. Budget guidelines were established by geographic region (Table 1) and data type. Proposals are solicited according to the following two data types. Stock status and trend studies, the first data type, are initially allocated two-thirds of available funding. These studies address abundance, composition, timing, behavior, or status of fish populations that sustain subsistence fisheries with nexus to Federal public lands. Harvest monitoring and traditional ecological knowledge studies, the second data type, are initially allocated one-third of available funding. These studies 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.

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					
Region	Dept. of the Interior		Dept. of Agriculture		Total	
	%	$	%	$	%	$
Northern	17.0	722			11.6	722
Yukon	29.0	1,233			19.7	1,233
Kuskokwim	29.0	1,233			19.7	1,233
Southwest	15.0	638			10.3	638
Southcentral	5.0	212	32.5	650	13.8	862
Southeast	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

KODIAK-ALEUTIANS AREA

Geographic Scope

The Monitoring Program is administered by geographic regions, one of which is the Southwest Region. The region includes the Kodiak, Alaska Peninsula, Aleutian Islands, Bristol Bay, and Chignik management areas. Prior planning has addressed the Bristol Bay and Chignik management areas[2]. This report addresses planning efforts for the Kodiak, Alaska Peninsula, and Aleutian Islands management areas (hereafter referred to as the Kodiak-Aleutians area).

[2] see www.r7.fws.gov/asm/

Federal public lands in the Kodiak-Aleutians area are extensive (Figures 1-3). Federal regulations apply on all public lands and navigable/non-navigable waters and certain marine waters, within and adjacent to the exterior boundaries of:

- Alaska Maritime National Wildlife Refuge,
- Izembek National Wildlife Refuge, and
- Kodiak National Wildlife Refuge.

Additionally, Federal regulations apply on a portion of public lands and navigable/non-navigable waters, except marine waters, including drainages flowing into Shelikof Strait and Pacific Ocean waters and all non-navigable waters, between Cape Douglas and Kilokak Rocks within:

- Alaska Peninsula National Wildlife Refuge,
- Aniakchak National Monument and Preserve,
- Becharof National Wildlife Refuge, and
- Katmai National Park.

Where a federal reservation with reserved water rights includes rivers or streams flowing into marine waters, reserved water rights will be asserted to the mouths of those rivers or streams, where the mouths are within the exterior boundaries of the reservation. Reserved water rights will not be asserted in marine waters except to the extent that the United States has already taken the position that submerged lands underlying marine waters reserved to the United States at the time of Alaska statehood meet the ANILCA definition of public lands. Within the Kodiak-Aleutians area, federal subsistence fishery jurisdiction includes marine waters only within four subunits of the Alaska Maritime National Wildlife Refuge:

- Afognak Island Subunit: All submerged lands and waters of the Pacific Ocean lying within 3 miles of the shoreline as described in Proclamation No. 39, December 24, 1892;
- Womens Bay Subunit: Womens Bay, Gibson Cove, portions of St. Paul Harbor and Chiniak Bay: All of the submerged land and water as described in Public Land Order 1182, July 7, 1955 (U.S. Survey 21539);
- Karluk Subunit: All of the submerged land and water of the Pacific Ocean (Sheliokof Strait) extending 3,000 feet from the shoreline between a point on the spit at the meander corner common to Sections 35 and 36 of Township 30 South, Range 33 West, and a point approximately 11⁄4 miles east of Rocky Point within Section 14 of Township 29 South, Range 31, West, Seward Meridian as described in Public Land Order 128, dated June 19, 1943; and
- Simeonof Subunit: All of the submerged land and water of Simeonof Island together with the adjacent waters of the Pacific Ocean extending 1 mile from the shoreline as described in Public Land Order 1749, October 30, 1958.

Subsistence Fisheries Units

Subsistence fisheries 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,

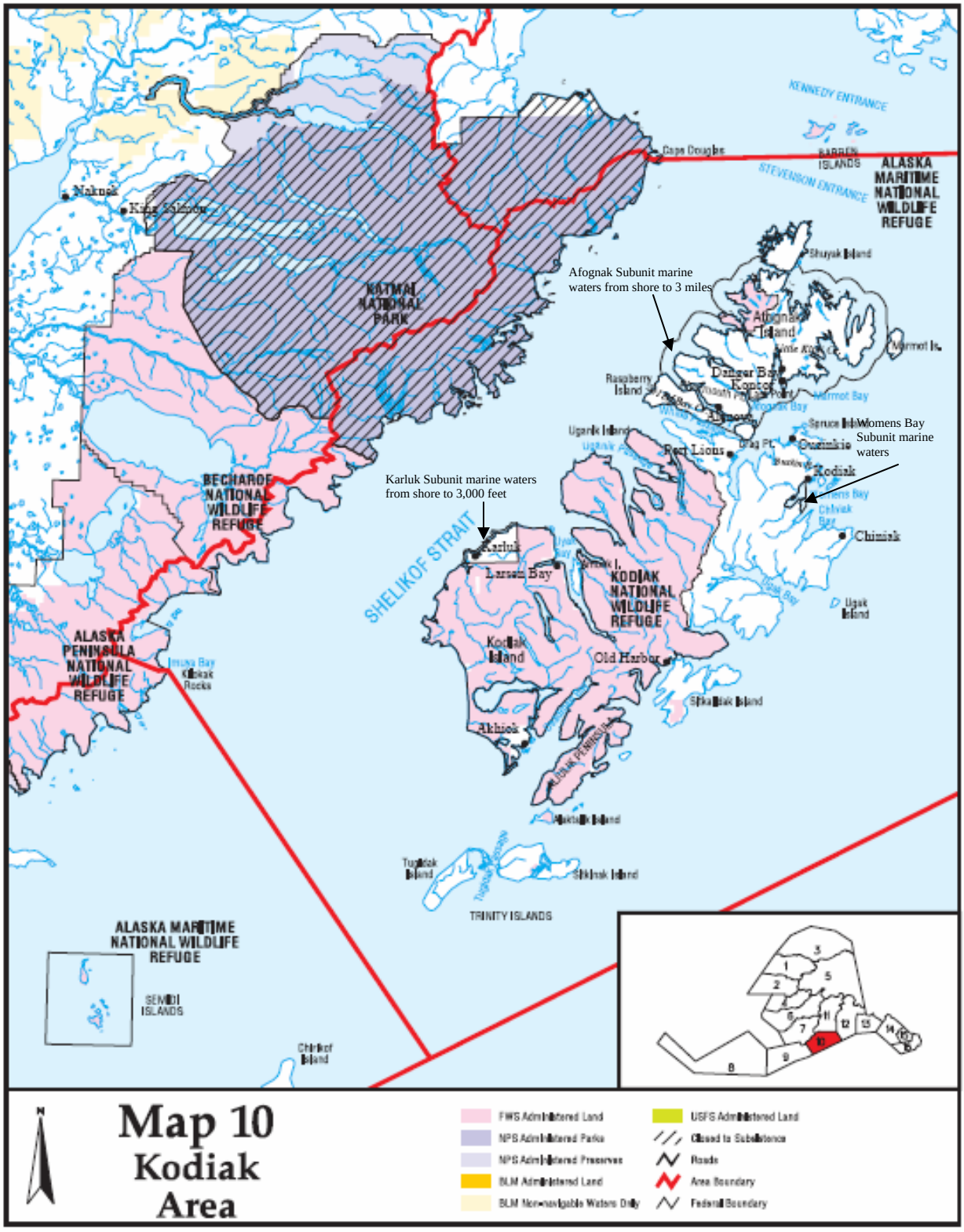

Figure 1. Federal public lands within the Kodiak Management Area. Marine waters Federal subsistence fisheries management jurisdiction only for Afognak, Karluk, and Womens Bay subunits of Alaska Maritime Wildlife Refuge.

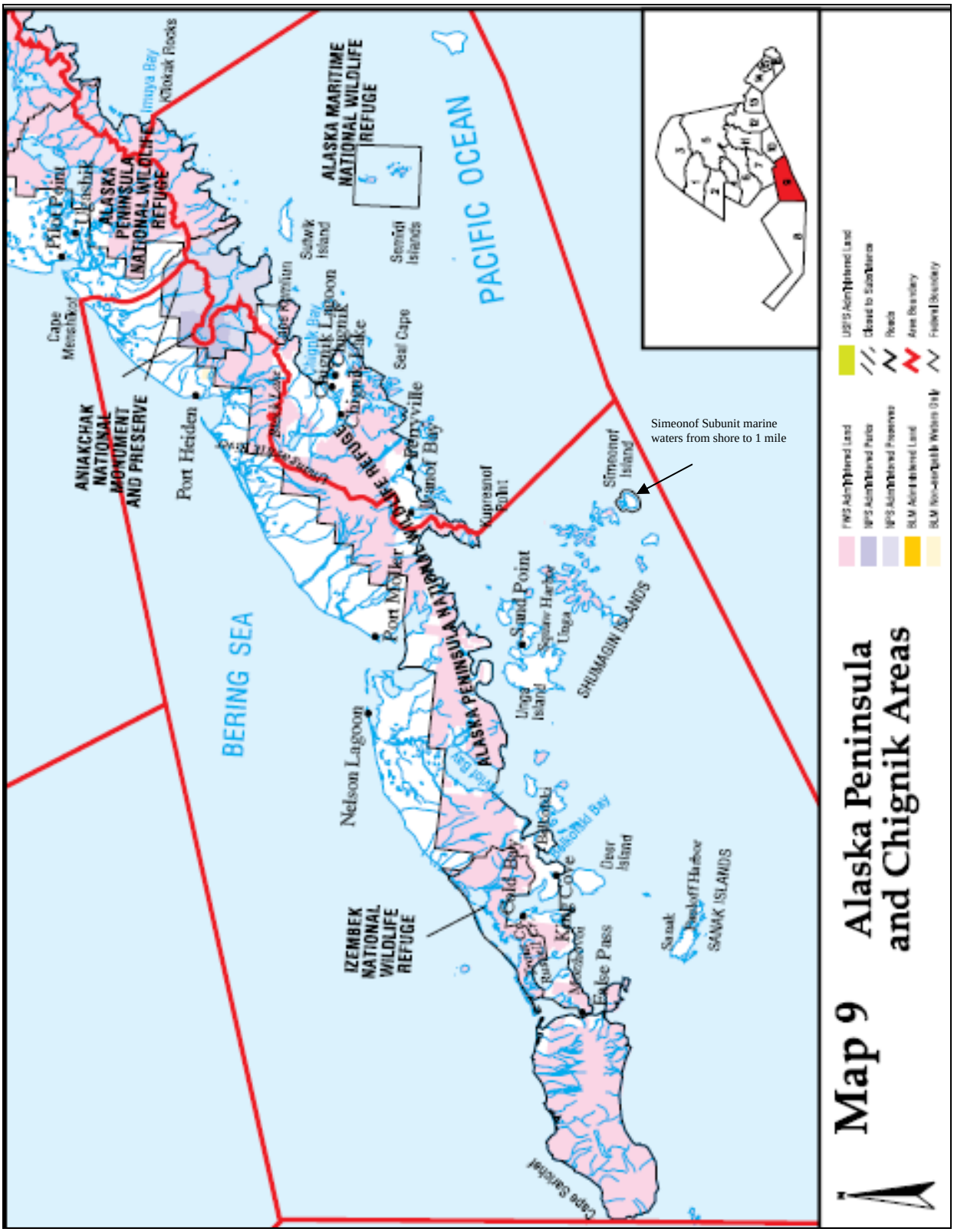

Figure 2. Federal public lands within the Alaska Peninsula Management Area. Marine waters Federal subsistence fishery management jurisdiction only for Simeonof Subunit of Alaska Maritime National Wildlife Refuge.

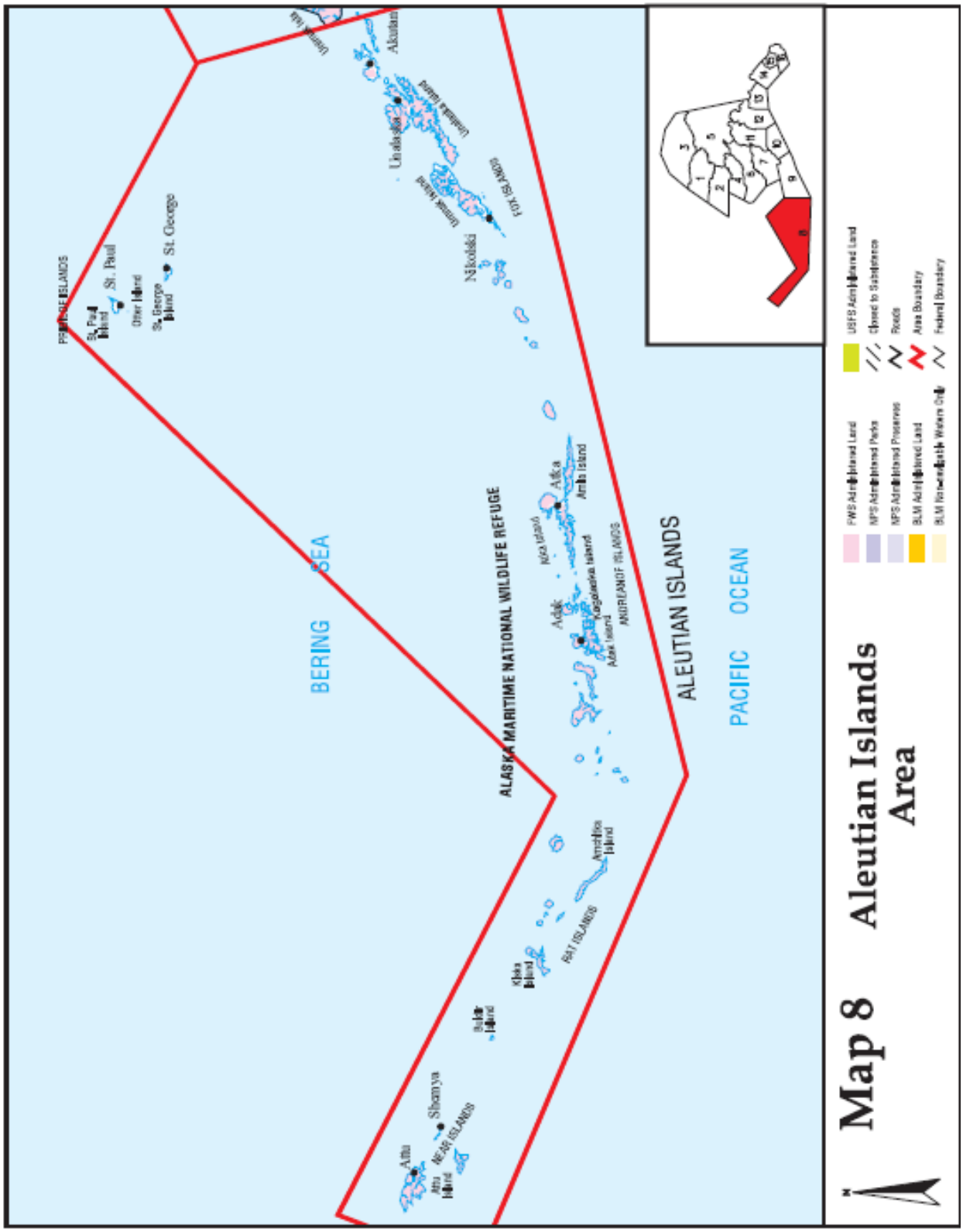

Figure 3. Federal public lands within the Aleutian Islands Management Area. No marine waters Federal subsistence fishery management jurisdiction.

and subsistence fishery users. For each unit, species are identified that are to be addressed for strategic planning at this time. Two subsistence fishery units, in order of importance, were identified for the Kodiak-Aleutians area:

1) Salmon - sockeye, coho, pink, Chinook, and chum salmon;
2) Non-salmon – Dolly Varden/Arctic char and rainbow/steelhead trout.

THE STRATEGIC PLAN AND PROCESS OVERVIEW

This draft strategic plan consists of frameworks of prioritized goals, objectives and information needs for Federal subsistence fisheries management within the Kodiak-Aleutians area, including a Glossary of terms (Appendix C). These products are the third phase in a process used to define strategic priorities for the Monitoring Program (Table 2). Strategic priorities are high priority information needs identified in the planning frameworks. This draft plan consists of three products:

- A framework of prioritized goals, objectives and information needs for Federal subsistence fishery management;
- An inventory of projects, past and present, that provide relevant information for each identified information need; and,
- Recommendations for actions that should be considered under the Monitoring Program for each information need – referred to as the knowledge gap analysis.

Table 2. Time frame for development of Kodiak-Aleutians strategic plan.

Phase	Time frame	Activity
One	Nov. 1-3, 2005	First workshop in Anchorage to structure the problem by fishery unit and prioritize information needs.
	Dec. 2005-Feb. 2006	Interim report drafted, including preliminary information inventory and knowledge gap analysis developed by FIS.
Two	March 2006	Interim report distributed to workgroup for review and comments.
	May 3-4, 2006	Second workshop in Anchorage to finalize the information inventory and knowledge gap analysis.
	June-July 2006	Report modified to reflect workgroup results.
Three	August 2006	Draft final report distributed to workgroup for review.
	Sept. 2006	FIS staff present draft final report to Council and solicit public comments.
	Nov. 2006	Final report completed, published, and distributed.

Strategic planning occurred in three phases (Table 2). The first phase included a November 2005 workshop in Anchorage at which participants structured the problem and prioritized information needs. The second phase included a May 2006 workshop in Anchorage at which participants completed the information inventory and conducted a knowledge gap analysis. Results of these workshops were the basis of the draft final report, which was reviewed by participants. The third phase included Council and public review of the interim report, and culminated in a completed strategic plan that will be used to focus the 2008 Request for Proposals. In subsequent years, the information inventory and knowledge gap analysis will be updated prior to each annual Request for Proposal. This will ensure Monitoring Program funding is used to address the highest priority information needs.

PLAN FRAMEWORK AND PRIORITIZATION

METHODS

Participants

Participants were solicited from professionals associated with Federal and State management or research of subsistence fisheries in the Kodiak-Aleutians area and also from local experts who are familiar with the fisheries. The Council was asked to provide several participants for this planning effort to effectively transition from the Council's issues and information needs and to provide valuable local input. To obtain a representative cross section of perspectives from regional professionals and experts of different disciplines, and to balance logistic considerations concerning group size, 18 people were invited. Of these, 15 were able to participate (Appendix D). The workshop was co-chaired by the participating fishery biologist and social scientist from FIS, while three additional FIS staff operated decision support software, recorded workshop notes, and provided computer assistance. A professional expert in facilitation and decision-making methods was hired to ensure that participants worked effectively together, discussions remained focused, and the agenda was accomplished.

Planning Approach

A systems approach, the Analytic Hierarchy Process (AHP) was used to structure the problem 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 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, was used interactively to structure the problem, depict the influence of weights, and derive the priority of elements. The AHP has been used to develop other strategic plans for the Monitoring Program (OSM 2005a and b) as well as to solve other fisheries research and management problems (NEFC 1990; Merritt and Criddle 1993, Merritt 1995, 2000, 2001, Merritt and Skilbred 2002).

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. Prior to the first workshop, OSM staff provided participants with the mission and goals of the Monitoring Program as well as objectives and information needs from completed strategic plans for other areas (OSM 2005 a and b). The workgroup refined the goal statements, and then identified objectives for each goal. Objectives form the third level of the hierarchy and are measurable statements of purpose. For each objective, participants identified information needs, which form the bottom level of the hierarchy and depict specific issues, impediments to overcome, data gaps, or uncertainties. To facilitate discussion and development of information needs within objectives, participants formed small workgroups. Recommendations from each workgroup were presented to the entire group for further comment and refinement.

Structuring of goals, objectives and information needs was first completed for the salmon fisheries unit, and this planning framework was subsequently used as a template from which to launch development of objectives and information needs for the non-salmon fisheries unit. Again, participants formed small workgroups to discuss information needs for each objective, and then presented their recommendations to the entire group for further comment and refinement.

Planning frameworks for the two subsistence fisheries units were completed during the second day of the workshop. Prioritization of the salmon fisheries unit framework was completed by the end of the second day. Prioritization of the non-salmon fisheries unit framework was completed during the third day.

There was considerable discussion about the importance of different salmon species within the salmon subsistence fisheries unit. Participants mentioned several criteria for judging importance among salmon species:

- Traditional use of certain salmon species by family or area;
- Federal nexus of the various salmon fisheries;
- Increasing harvest and use of Chinook salmon in marine waters during the winter, which now provides a source of fresh fish year-round; and,
- Availability of certain species, such as pink and chum salmon, which generally have distinct cycles of abundance.

The group agreed to defer final judgments of importance among salmon species until the third day of the workshop, so that they had time to share additional information and learn from each other.

Importance among goals, objectives and information needs was judged in relation to Federal subsistence fishery management needs for understanding:

- Fishery resources and their sustainability (including vulnerability to over harvest, effects of habitat loss or changes, and management consequences of uncertainty); and
- Harvests and uses (including degree of exploitation, importance to users, accuracy of harvest data, and degree of allocation); and
- Role and importance of fishery resources in sustaining ecosystems.

Using these criteria as guidelines, the workgroup was asked to use their expert judgment to individually assign ratings of importance to each level (goals, objectives, and information needs) of the planning framework through a process of pairwise comparisons. First, the relative importance of goals was evaluated, then that of objectives within each goal, and finally that of information needs within each objective. Participants were given time to think about and write down their importance ratings based on a numeric scale before entering them into the Group Version of Expert Choice software using individual wireless keypads. Group results were displayed as bar graphs. The keypads made it quick and easy to elicit and record judgments as well as display results. A positive ratio scale with associated verbal equivalents was used to rate importance:

Scale of Importance	Definition
9	Extremely important
7	
5	
3	
1	Slightly important

Elements judged to be of equal importance were given equal scores. Numbers between those listed, for example 2 or 2.5, were used to interpolate meanings as a compromise. While not required, consensus within a range of two to three points on the rating of elements was usually achieved among participants. When a large disparity in judging importance occurred, it meant there was either disagreement or misunderstanding, 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. This process 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 workgroup'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 propositions over all objectives within a goal:

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

where

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

Structural Adjust

Structural imbalance in the hierarchy can lead to dilution of the weight of information needs when there are unequal numbers of needs under each 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. While approximate balance is sought in structuring, complex problems do not always lend themselves to balanced structures, and the structural adjust feature is often used.

RESULTS AND DISCUSSION

Goals

FIS recognizes 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, the workgroup carefully reworded the first three goals, which form the basis for the Kodiak-Aleutians strategic plan. The fourth goal concerning public support and involvement will undergo its own statewide planning process.

The first three goals involve collection and synthesis of information, and represent unique concepts:

1. Obtain biological information to provide for Federal subsistence fisheries.
2. Assess and monitor Federal subsistence fisheries to document subsistence use.
3. Effective management to provide for Federal subsistence uses.

The workgroup recognized that traditional ecological knowledge (TEK) is a method that is potentially applicable to all three goals, and that capacity building is a desired outcome of conducting any project.

Subsistence Fisheries Units

Subsistence fisheries 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. The workgroup identified two subsistence fisheries units, in order of importance:

1. Kodiak-Aleutians salmon fisheries unit, and
2. Kodiak-Aleutians non-salmon fisheries unit.

The workgroup did not see a need to further subdivide these units based on geography since they felt management is similar within each fisheries unit throughout the entire area. For each unit, the workgroup then identified species that needed to be addressed for strategic planning at this time.

The importance of salmon species within the salmon fishery unit generated substantial discussion among participants over the course of the workshop. Participants mentioned the difficulty in using annual reported harvest by species on permits as a criterion of importance because significant under-reporting is probable. Three issues relating to under-reporting were discussed:

1. Some salmon reported as sport caught are really for subsistence use;
2. There is some undocumented retention of salmon for home use in commercial fisheries, which could be substantial (particularly Chinook); and,
3. Harvest limits printed on subsistence permits may be misunderstood by some individuals, which may cause under-reporting of harvests to comply with permit limits.

Participants agreed that sport- and commercially-caught salmon retained for subsistence uses should be included as a component of subsistence harvests. The workgroup also thought that subsistence harvest limits on permits either needed to be increased for the original permit or better clarified so that users knew they could request another permit to harvest more salmon.

Determining species priority within the salmon fisheries unit was complicated by some misunderstandings as well as regulatory changes concerning Federal subsistence management authority within marine waters. These discussions highlighted some of the complexities and difficulties encountered in Federal-State dual management. Federal subsistence management authority in marine waters was recently reduced by a rule that relinquished Department of Interior claims to marine waters adjacent to the Alaska Peninsula and Izembek National Wildlife Refuge boundaries, since these waters were never intended to fall under Federal Subsistence Management Program jurisdiction.[3] Although the Alaska Maritime National Wildlife Refuge includes most of the Aleutian Islands, Federal subsistence fisheries management authority for Kodiak-Aleutians area marine waters only includes marine waters surrounding Afognak Island out to 3 miles, Kodiak Island's Womens Bay, a portion of marine waters off Karluk extending about 3,000 feet from shore, and marine waters surrounding Simeonof Island out to 1 mile. All other nearshore marine waters, including those around the Aleutian Islands, are under State subsistence fisheries management jurisdiction.

There was some disagreement about the role of traditional versus current and future subsistence uses in assigning importance to salmon species, particularly for Chinook salmon. Some participants initially ranked Chinook salmon as highly important because of a growing interest in harvesting Chinook salmon in marine waters during the winter. Other participants ranked Chinook salmon lower in importance, citing a limited history of use and no record of regulatory concern. There was general agreement among participants that sockeye salmon are an important subsistence resource during the spring, while coho salmon are important during the fall. Some participants also indicated that pink salmon are traditionally important species in many areas. Ultimately, the workgroup's recommendations for priority of salmon species within the salmon fishery unit came at the end of the first workshop, following much discussion and sharing of information (Table 3).

During the second workshop, participants were asked whether they also wanted to rank the importance of specific river/lake systems or salmon runs. While the workgroup agreed on

[3] This rule became effective January 26, 2006.

Table 3. Important salmon species in the Kodiak-Aleutians area.

Species	Rating of Importance (numerical score)	Comments of Participants
Sockeye and Coho	High (9)	◦ Despite harvest reporting problems, sockeye and coho are taken in far greater numbers than Chinook salmon. ◦ Sockeye salmon are very important for residents of the Kodiak archipelago, but few sockeye salmon are harvested by Aleutian Islands residents. ◦ Most Monitoring Program projects in this area focus on sockeye and coho salmon.
Pinks	Moderately high (7)	◦ Pink salmon are an important component of harvests from Karluk, Larsen Bay, and the Aleutian Islands. ◦ All Kodiak Island village residents put up a lot of pink salmon for long term storage. ◦ Pink salmon abundance is cyclic, and Kodiak runs are generally most abundant on even years.
Chinook	Moderately high (7)	◦ Chinook salmon harvests primarily occur in state waters during the winter troll fishery. ◦ Prior to the winter troll fishery, Chinook salmon was harvested in May for subsistence use. ◦ Growing interest in harvesting Chinook salmon may pose a problem for subsistence users in the future. ◦ No one knows if the growing interest in Chinook salmon is due to increased abundance or changes in fishing patterns.
Chum	Moderate (5)	◦ Chum salmon importance depends upon annual abundance.

priorities for some systems (Table 4), participants decided they would like the Council to continue to provide input on specific systems and runs as issues arise. The Council's existing list was first developed in 2002 and has not undergone much revision since that time (Appendix E). The workgroup felt that the Council should review and, if needed, update this list each year. The workgroup also stated that they did not wish to limit proposals only to runs identified by the Council, since some issues could be missed, and urged consideration of any proposal for which the investigators were able to clearly show:

- A federal nexus,
- The importance of the run to federally qualified subsistence users, and
- A need for the information to be collected.

In addition to salmon, other fishes and aquatic invertebrates were said to be important as subsistence resources in the Kodiak-Aleutians area, including many marine species. However, there is very limited or no Federal nexus for marine species. Some participants even thought that

Table 4. Comments offered by Kodiak-Aleutians workgroup on salmon systems of interest.

Systems of Interest Identified by Council	Workgroup Priority Ranking	Workgroup Comments
Afognak Lake and Buskin River (Kodiak)	High	These systems support the two largest sockeye salmon subsistence fisheries in the Kodiak area, and most subsistence harvests occur within Federal waters. The run to Afognak Lake has declined and rebuilding efforts are underway. An issue of concern associated with these systems is effects of Dolly Varden predation on juvenile salmon, particularly during smolt migration.
Akalura (Kodiak)	Uncertain	Historically, aerial surveys documented large sockeye salmon runs to this system, and the escapement goal was 40,000 to 60,000 spawners. However, the run has declined, escapements have been below the goal, and data collection has been discontinued. While restoration of this run is a priority for the Kodiak National Wildlife Refuge, benefits to subsistence users from restoration are uncertain because the run is harvested in commercial mixed stock fisheries.
Horse Marine Lagoon, Moser Bay, and Silver Salmon Creek (Kodiak)	Uncertain	This sockeye salmon run was historically important for subsistence use, but people now tend to obtain their fish from other locations. These stocks, along with Akalura, are harvested in mixed stock commercial fisheries in Olga Bay. Only the larger runs in the Bay are monitored, and the Council has expressed concern that smaller runs may be overexploited. Coho salmon runs to these systems are also small. Other issues associated with these systems include effects of Dolly Varden predation on juvenile salmon and possible habitat problems. Benefits from research on these systems might mostly accrue to commercial fisheries.
Mortensens Creek (Alaska Peninsula)	Low	This resource is important to subsistence as well as sport fishers from Unalaska. Sockeye salmon escapements to this system have been adequate, and no problems with the run or harvests have been identified. Participants felt it was important to monitor harvests.
Unalaska Lake (Aleutians)	Uncertain	This system only has a small run of sockeye salmon, and most people travel to Reese Bay to harvest sockeye salmon for their subsistence needs.
Adak (Aleutians)	Low	While this community is currently non-rural, and subsistence needs are being met for the few hundred residents, the community may soon be reclassified as rural, and the Council is concerned with potential impacts on fishery resources if the community grows.

-continued-

Table 4. Continued.

Systems of Interest Identified by Council	Workgroup Priority Ranking	Workgroup Comments
Hoodoo Lake (Alaska Peninsula)	Low	There are no documented fishery problems or conservation concerns for the sockeye salmon run, but the status of the coho salmon run was not known.
Zelda Creek (Alaska Peninsula)	Uncertain	The only issue associated with this system was the effect of people driving their four wheelers in the stream. This problem may have been resolved.
Nikolski Bay (Aleutians)	Uncertain	Workgroup participants were not familiar with this system.
Big Creek (Kodiak)	Uncertain	The coho run to this system is important to Old Harbor residents, and they have expressed concern over a growing sport fishery. An annual monitoring program is not in place, so collection of baseline information may be needed.
Summer Bay (Aleutians)	Uncertain	There have been poor salmon runs, although some harvesting of coho salmon occurs. Sport fishing closures have occurred, and there is some concern with the lack of fishery law enforcement effort in this area.

Federal nexus should extend to important forage species for salmon and char, such as juvenile cod and herring. However, Federal subsistence fisheries management authority only deals with species that are harvested by rural residents and associated with Federal conservation units. The workgroup finally recommended that the following species be included in the non-salmon fishery unit, but did not rate them in importance to each other:

- Dolly Varden/Arctic char, and
- Rainbow/steelhead trout.

While rainbow/steelhead trout are currently taxonomically classified as a species of Pacific salmon, the workgroup felt management and uses of this species were different than those for other salmon species, which warranted inclusion of this species within the non-salmon fisheries unit. As was determined for salmon, the workgroup agreed that sport- and commercially-caught non-salmon species retained for subsistence uses should be included as a component of subsistence harvests. Participants felt that management agencies needed to work with residents to determine the best way to document these subsistence harvests. Under-reporting of non-salmon harvests was also discussed, as well as other reporting problems due to species misidentification. For example, most people do not differentiate between Arctic char and Dolly Varden when reporting harvest, and sometimes refer to both species as “trout”.

Kodiak-Aleutians Salmon Subsistence Fisheries Unit

Plan Framework A total of 32 elements comprise the salmon plan framework (Figure 4): three goals, seven objectives, and 22 information needs. There are eight information needs under Goal 1, nine under Goal 2, and five under Goal 3. Since the framework is slightly imbalanced, the

structural adjust feature in Expert Choice was used to restore priorities to their intended proportion of weight.

Goals The workgroup carefully considered the relative importance of the three goals: obtaining biological information on salmon, assessing and monitoring subsistence fisheries, and effective management. There was considerable discussion concerning the relative importance of obtaining biological information on salmon versus assessing and monitoring subsistence fisheries. One participant noted that without information on salmon abundance and biology, it would be difficult to sustain subsistence uses. An alternative viewpoint was that it would be difficult to focus biological research efforts without information on what and how many of each species were being harvested. Other participants felt that both these goals were equally important because accurate knowledge of both the resources and fisheries was needed to sustain subsistence fisheries on Federal lands. There was more agreement on the importance of effective management in relation to the other two goals. The workgroup was unanimous in their view that obtaining biological information was more important than effective management, noting that management cannot be effective without biological information. Several participants made a similar argument for the greater importance of harvest information, indicating that harvest information directs the management regime and that the quantity and quality of harvest information is directly related to management effectiveness. However, some participants felt that despite the legal priority for subsistence use, effective management was more important than harvest information since this was the only way to ensure that sufficient salmon remain for subsistence use in the face of larger, and sometimes politically more important, commercial fisheries.

Ultimately, the workgroup decided that obtaining biological information should be the most important goal (Goal 1, 43.3% of total weight), assessing and monitoring subsistence fisheries should be the second most important goal (Goal 2, 32.8%), and effective management should be the third most important goal (Goal 3, 23.9%) of the Monitoring Program (Figure 4). Several participants felt these rankings reflected a sequential nature in achieving these goals (for example, biological and fishery information was needed to develop effective management).

Objectives Prioritization of the two objectives under Goal 1 resulted in stimulating discussion about the importance of determining salmon production needed to support fisheries, a process-oriented objective, versus the importance of describing abundance, composition and timing of salmon populations, an empirical objective. Some participants felt there was a sequential nature to these goals in that reliable estimates of abundance were needed before production could be estimated. The workgroup also emphasized that communities should be involved in attaining these objectives, and were reminded that consultations and capacity building were important components of all Monitoring Program projects.

Eventually, the workgroup decided that describing abundance, composition, and timing was slightly more important (Objective 1A, 23.5% of total weight) than determining the production needed to support fisheries (Objective 1B, 19.8%) as Goal 1 objectives (Figure 4).

In prioritizing the three objectives under Goal 2, workgroup members initially disagreed on whether subsistence harvest levels were more or less important than past and present patterns of use. This was largely resolved once participants realized that harvest levels more directly relate to sustainability, while use patterns refer to trends in fishing methods and means as well as

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GOAL		OBJECTIVE		INFORMATION NEED
0.433 1. Obtain biological information to for subsistence uses	0.235	A. Describe composition, and of salmon populations	0.071	1. Estimate abundance of total run by species and river/lake system
			0.069	2. Obtain reliable estimates of spawning escapement over time
			0.062	3. Determine adult run timing & migration patterns by stock, size, and age
			0.033	4. Define and catalog management units for subsistence fisheries
	0.198	B. Determine salmon production needed to support fisheries	0.062	1. Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks
			0.060	2. Describe relationship between escapement and production including smolt production
			0.046	3. Determine quantity of salmon by river/lake system needed to sustain ecosystem functions
			0.030	4. Relate historic salmon harvest to current productivity levels of river/lake systems
0.328 2. Assess and subsistence fisheries to document uses	0.155	A. Document the current fishery	0.099	1. Estimate annual subsistence use, harvest, effort by location, gear type, species, and date
			0.042	2. Improve reporting systems for Federal subsistence harvests
			0.014	3. Independently verify harvest data
	0.128	B. Identify and past and present subsistence harvest use patterns	0.064	1. Identify environmental, demographic, regulatory, cultural (education), and socioeconomic factors affecting subsistence harvest levels
			0.033	2. Describe current and traditional methods and means by species and area
			0.031	3. Describe and document current and traditional uses and distribution practices
	0.045	C. Project future use patterns	0.023	1. Gather local perspectives on future use patterns
			0.018	2. Evaluate key factors influencing future use patterns
			0.004	3. Build process based models to predict future use patterns
0.239 3. Effective management to provide for subsistence uses	0.151	A. Develop and management strategies for subsistence	0.063	1. Examine the effectiveness of current regulations for subsistence harvests
			0.056	2. Develop real time information sharing among user groups and agencies
			0.032	3. Examine alternative management strategies
	0.088	B. Assess impacts of other fisheries	0.044	1. Describe socioeconomic impacts of other fisheries
			0.044	2. Describe harvest rates by fishery for specific stocks of interest

Figure 4. Framework of goals, objectives and information needs, including adjusted weights of importance, Kodiak-Aleutians salmon fisheries unit, 2005.

distribution practices. All participants agreed that projecting future use patterns was the least important objective

Overall, there was agreement that documenting current fisheries was most important (Objective 2A, 15.5% of total weight), identifying and describing past and present use patterns was a close second (Objective A2, 12.8%), and projecting future use patterns was least important (Objective A3, 4.5%) of Goal 2 objectives (Figure 4).

Finally, little discussion was needed in prioritizing the two objectives under Goal 3. There was general agreement that developing and evaluating management strategies was more important (Objective 3A, 15.1% of total weight) than assessing impacts of other fisheries (Objective A2, 8.8%) as Goal 3 objectives (Figure 4).

Information Needs In prioritizing information needs under Goal 1 objectives, the workgroup acknowledged the importance of collecting and analyzing time series data, for example, following cohorts over time. Most discussion focused on the four information needs under Objective 1A. The workgroup thought that in order to obtain reliable estimates of total run by species and river/lake system, the accuracy of subsistence harvest estimates needed to be improved. They felt that obtaining reliable estimates of spawning escapement was of slightly greater importance than determining adult run timing and migration patterns by stock, size, and age. They also thought there was often a sequential order to obtaining this information since escapement enumeration projects also generally provided information on run timing as well as size and age. There was also discussion concerning the definition of a "management unit", particularly since there is no legal definition to guide management. Depending upon the situation, a management unit could be an individual stock, a run to a single drainage system, or a collection of runs to several streams.

Discussion on Objective 1B information needs was generally focused on the importance of identifying critical factors that affect population dynamics and describing the relationship between escapement and production. While setting and evaluating escapement goals is the current basis for salmon management, many participants felt that it was often difficult do this because there is often insufficient information about critical factors affecting population dynamics. However, they acknowledged the difficulties involved in identifying critical factors, particularly since a wide range of factors must be considered, including environmental and human induced effects. Finally, participants also felt it was important to obtain information on habitat, including the amount and quality of habitat suitable for spawning and rearing as well as that needed for migratory corridors.

For Goal 1, the workgroup ranked the top three information needs as (Figures 4 and 5):

- Estimate abundance of total run by species and river/lake system (7.1% of total weight);
- Obtain reliable estimates of spawning escapement over time (6.9%); and, tied for third,
- Identify critical factors that affect population dynamics including the effects of restoration and enhancement on wild stocks; Determine adult run timing and migration patterns by stock, size and age (6.2% each).

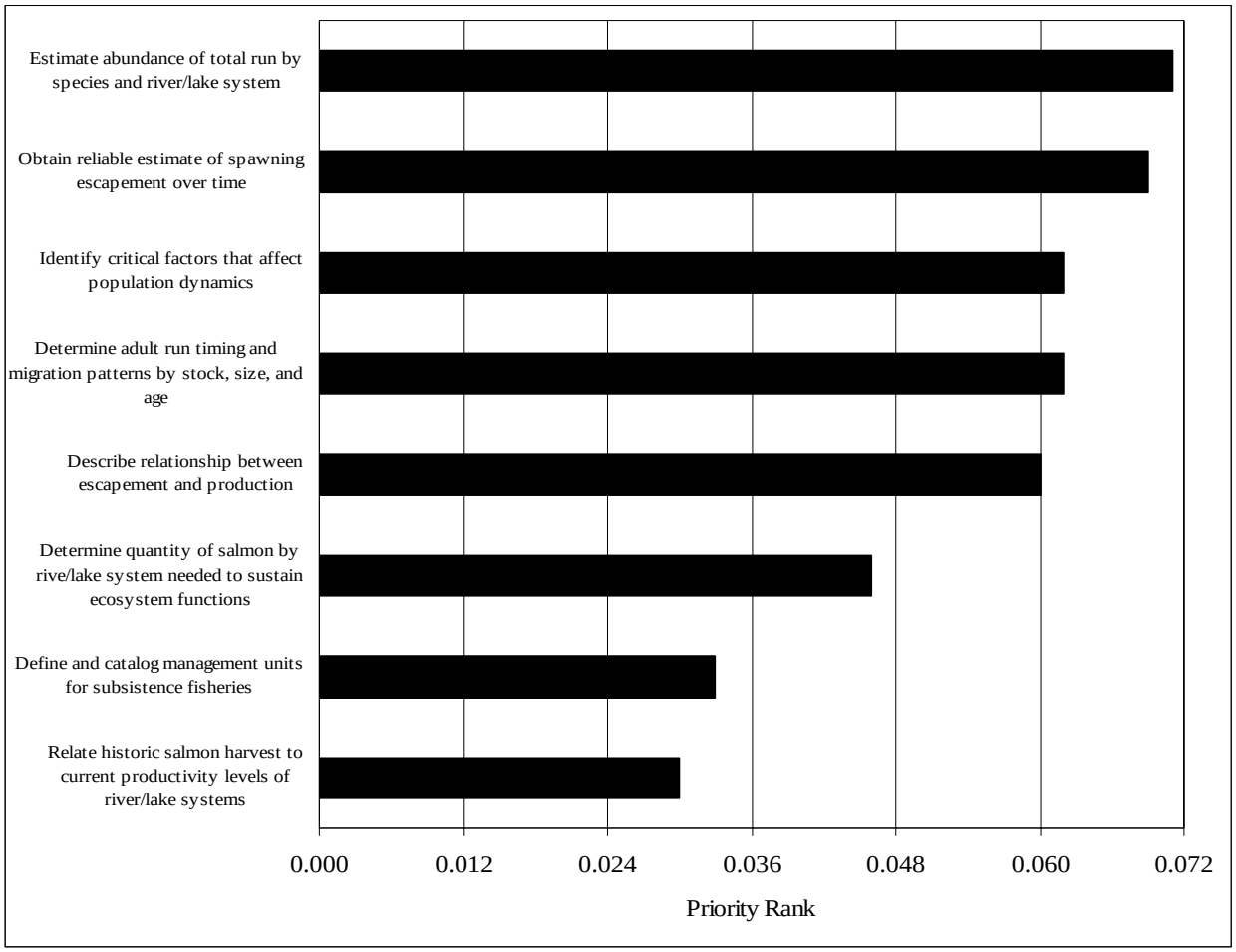

Figure 5. Priority of information needs for Goal 1: Obtain biological information to provide for Federal subsistence fisheries, Kodiak-Aleutians salmon fisheries unit.

In prioritizing information needs under Goal 2 objectives, the workgroup again noted that sequential aspects often came into play when collecting information. Thus, priorities for certain information needs may have to reflect this sequential order. For example, the three information needs to project future use patterns (Objective 2C) have a sequential order. First local perspectives must be gathered and then key factors pertaining to future use patterns must be evaluated, before process based models can be built. A fourth step in this sequence is to ask the local community to review and comment on the model. Some participants felt that information needs concerning traditional use is extremely important because tradition is a core principal for claiming subsistence priority in law.

The workgroup also took time to clarify terms used for Objective 2 information needs. They wanted the term "past" to convey the concept of "traditional", thought the term "to process" is included in the meaning of "use", and wanted to ensure that the term "factors" affecting subsistence harvest levels included environmental, demographic, regulatory, cultural (education), and socioeconomic aspects.

To accurately document salmon subsistence fisheries, participants agreed there is a need to improve the reporting system and to independently verify the data. Local representatives need to be involved in data collection, and managers need to work with subsistence users to make them aware of the mutual benefits of reliable harvest information. The workgroup also talked about the need to describe socioeconomic effects of other fisheries on subsistence uses. They were particularly concerned about impacts of growing sport fisheries and salmon bycatch by commercial trawlers. Related to this, there is a need to determine total harvest rates that include all sources of fishing mortality and to obtain accurate exploitation estimates for all stocks within mixed stock salmon fisheries, particularly when concerns exist for smaller or less productive runs.

For Goal 2, the workgroup ranked the top three information needs as (Figures 4 and 6):

- Estimate annual subsistence use, harvest and effort by location, gear type, species, and date (9.9% of total weight);
- Identify factors affecting subsistence harvest levels (6.4%); and
- Improve reporting systems for Federal subsistence harvests (4.2%).

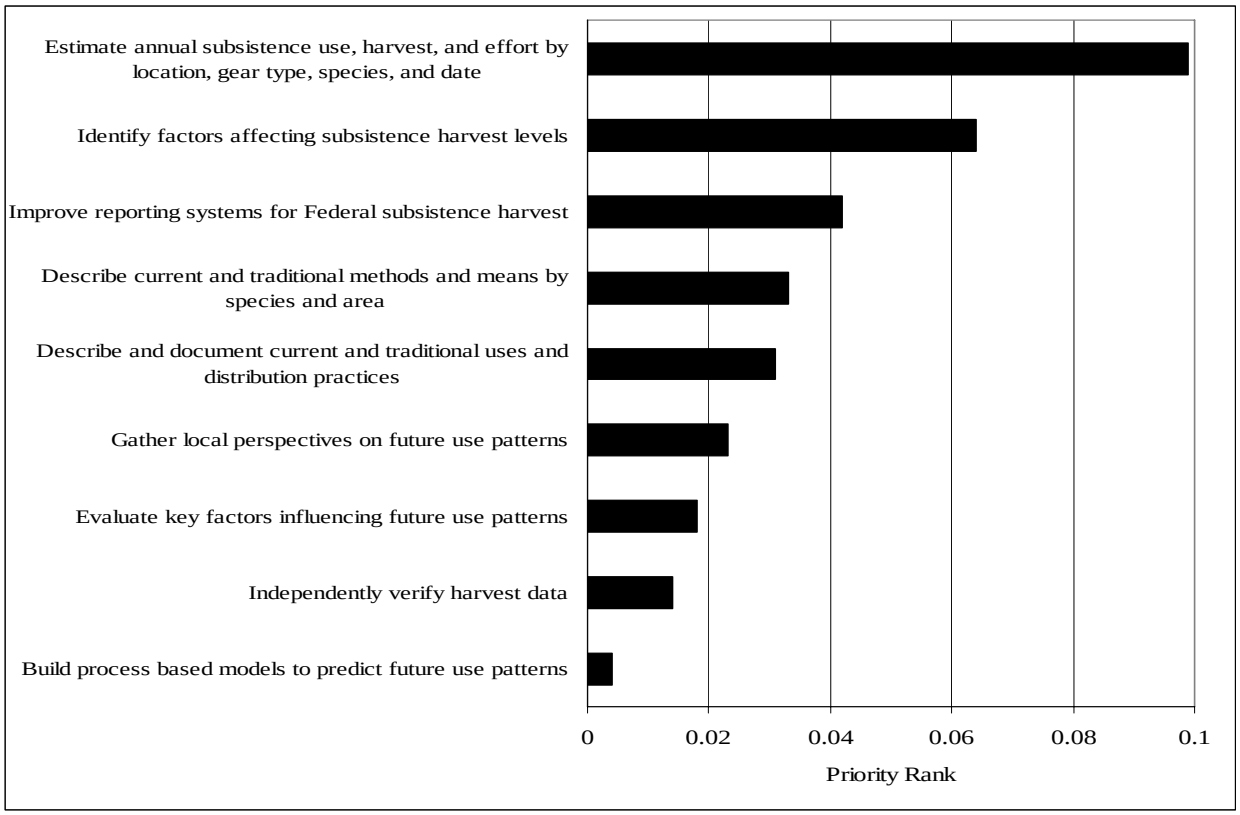

Figure 6. Priority of information needs for Goal 2: Assess and monitor Federal subsistence fisheries to document uses, Kodiak-Aleutians salmon fisheries unit.

In prioritizing information needs among Goal 3 objectives, some participants strongly felt that talking with user groups should be the first step in examining effectiveness of regulations; while others thought management decisions needed to be made and then shared with users. Some participants suggested that real-time information sharing among commercial, sport and

subsistence fisheries agencies could improve harvest monitoring accuracy as well as resource assessment. Everyone agreed that communication and information distribution among user groups and agencies could be improved, including information collected and decisions made by agencies. While most participants agreed information sharing can help make existing regulations more effective, some of the agency representatives reminded them that anyone could submit a proposal to change regulations to make them more effective as well as to set new ones. Several participants also thought there should be more frequent evaluations of regulations to determine their effectiveness at achieving intended objectives, including compliance by user groups. Almost everyone agreed there is a need to streamline and clarify existing regulations. Ultimately, the workgroup decided that sharing information on ineffective regulations is not helpful, unless it brings about changes; and felt that the need to examine the effectiveness of regulations was slightly more important that than the need to develop real time information sharing. Finally, the workgroup felt that the need to describe socioeconomic impacts of other fisheries and the need to describe harvest rates by fishery were of equal importance.

For Goal 3, the workgroup ranked the top three information needs as (Figures 4 and 7):

- Examine the effectiveness of current regulations for subsistence harvest (6.3%% total weight);
- Develop real time information sharing among user groups and agencies (5.6%); and, tied for third,
- Describe socioeconomic impacts of other fisheries; Describe harvest rates by fishery for specific stocks of interest (4.4% each).

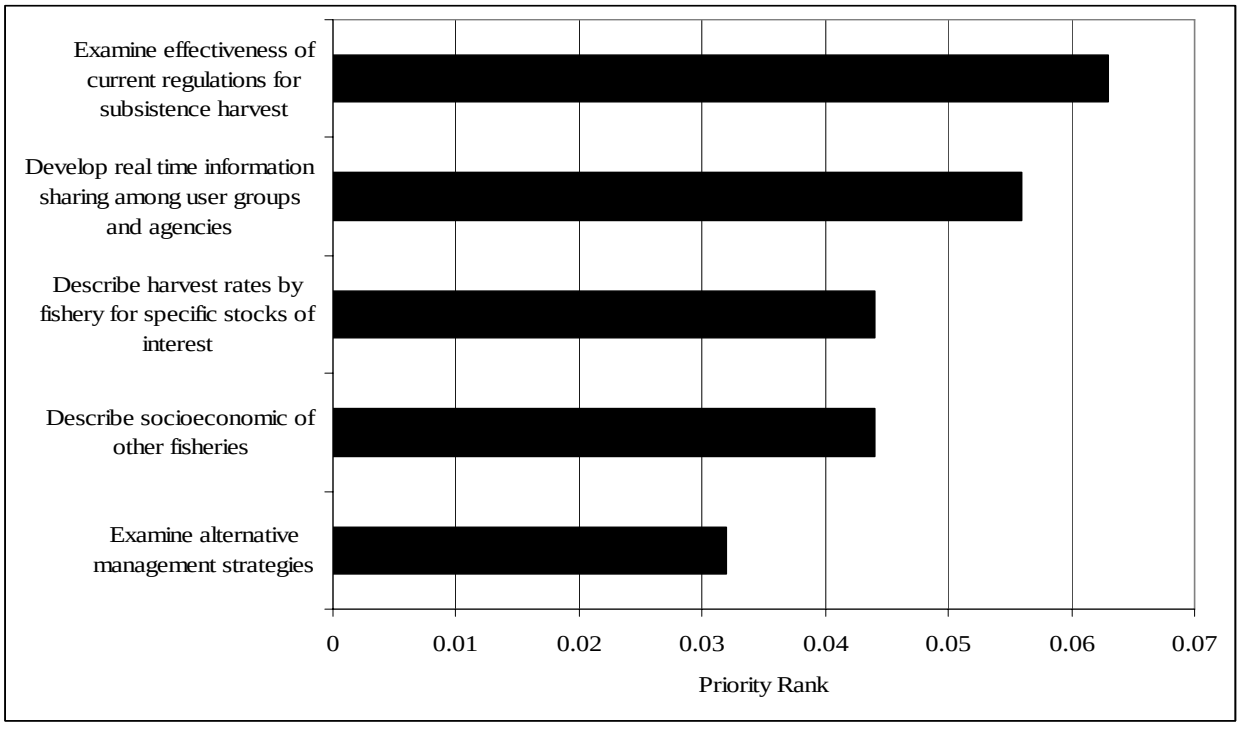

Figure 7. Priority of information needs for Goal 3: Effective management to provide for Federal subsistence uses, Kodiak-Aleutians salmon fisheries unit.

For the entire framework, the top five ranked information needs account for 36.6% of the total weight (Figures 4 and 8):

- Estimate annual subsistence use, harvest and effort by location, gear type, species and date (9.9% of total weight; Goal 2);
- Estimate abundance of total run by species and river/lake system (7.1%; Goal 1);
- Obtain reliable estimates of spawning escapement over time (6.9%; Goal 1);
- Identify factors affecting subsistence harvest levels (6.4%; Goal 2); and
- Examine effectiveness of current regulations for subsistence harvest (6.3% Goal 3).

These five top ranked information needs encompass the highest priority need within each of the three goals as well as the second highest priority need within goals 1 and 2 (Figures 4 and 8). Priority rankings of information needs sharply decline after the first eight or nine top ranked needs, which account for 49% to 55% of the total weight.

Kodiak-Aleutians Non-Salmon Subsistence Fisheries Unit

Plan Framework A total of 26 elements comprise the non-salmon plan framework (Figure 9): three goals, seven objectives, and 16 information needs. There are five or six information needs under each of the goals, and one to five under each objective. To correct for this slight framework imbalance, the structural adjust feature in Expert Choice was again used to restore priorities to their intended proportion of weight.

Goals The workgroup carefully considered the relative importance of the three goals: obtaining biological information on non-salmon species, assessing and monitoring subsistence fisheries, and effective management. In general, very little is known about harvest, use, and effort in non-salmon subsistence fisheries, and the workgroup agreed that assessing and monitoring subsistence fisheries should be the top-ranked goal (Goal 1, 50.8% of total weight (Figure 9)). There was also general agreement that obtaining biological information was more important (Goal 2, 33.2%) than effective management (Goal 3, 16.0%) since effective management is not possible without good information on the fisheries and the resources.

Objectives The workgroup identified and discussed three research objectives under Goal 1: identifying and describing past and present subsistence harvest use patterns; documenting current fisheries; and projecting future use patterns. For non-salmon species, the workgroup thought that periodic, rather than annual, assessment of use, harvest and effort would be adequate to manage non-salmon subsistence fisheries. While there was overwhelming agreement that projecting future use patterns was the least important objective (Objective 1C, 8.0% of total weight; Figure 9), there was discussion on whether documenting current fisheries was more important than examining harvest use patterns. The workgroup ultimately decided that identifying and describing use patterns was considerably more important (Objective 1A, 31.4%) than documenting current fisheries (Objective 1B, 11.4%).

In discussing the two objectives identified under Goal 2, the workgroup had little trouble in deciding that describing biology and assessing stocks was much more important (Objective 2A, 22.7% of total weight) than determining stock dynamics (objective 2B, 10.5%; Figure 9). This decision was largely based on the perception that there was a sequential nature in collecting and

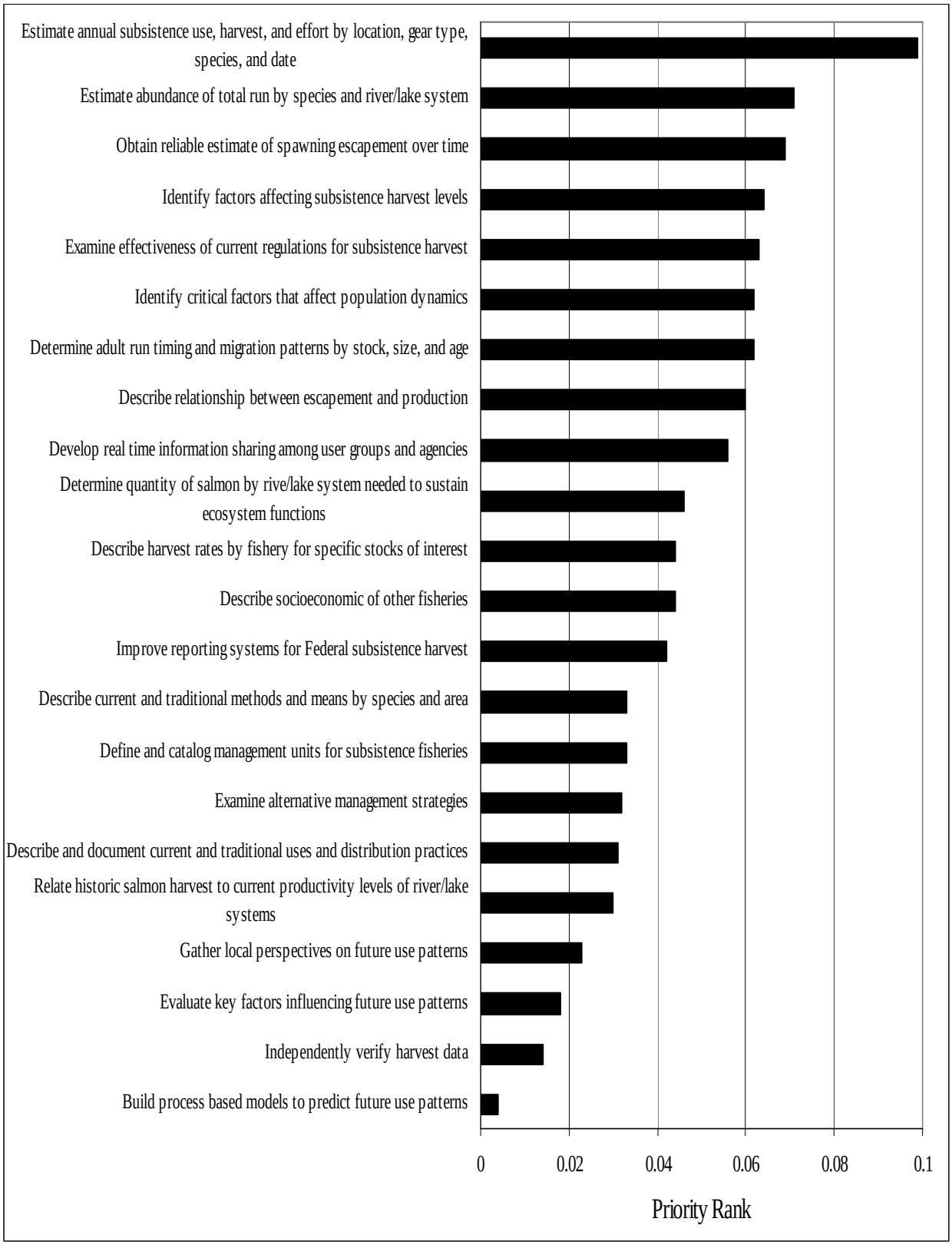

Figure 8. Adjusted synthesis of all 22 information needs, Kodiak-Aleutians salmon fisheries unit.

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GOAL		OBJECTIVE		INFORMATION NEED
0.508 **1. Assess and monitor subsistence fisheries to document uses**	0.314	A. Identify and describe past and present subsistence harvest use patterns	0.134	1. Identify environmental, demographic, regulatory, cultural (education), and socioeconomic factors affecting subsistence harvest levels
			0.095	2. Describe current and traditional methods and means by species, and area
			0.085	3. Describe and document current and traditional uses and distribution practices
	0.114	B. Document the current fishery	0.114	1.Periodically (three to five years) estimate subsistence use, harvest, and effort by location, gear type, species, and date
	0.080	C. Project future use patterns	0.045	1. Gather local perspectives on future use patterns
			0.035	2. Evaluate key factors influencing future use patterns
0.332 **2. Obtain biological information to provide for subsistence uses**	0.227	A. Describe biology and assess stocks	0.090	1. Identify stocks
			0.072	2. Estimate abundance and composition
			0.065	3. Characterize life history, distribution, and timing
	0.105	B. Determine stock dynamics	0.058	1. Describe critical factors that affect population dynamics
			0.047	2. Describe trends in stocks
0.160 **3. Effective management to provide for subsistence uses**	0.095	A. Develop and evaluate management strategies for subsistence fisheries	0.038	1. Develop real time information sharing among user groups and agencies
			0.032	2. Examine the effectiveness of current regulations for Federal subsistence harvest
			0.025	3. Examine alternative management strategies
	0.065	B. Assess impacts of other fisheries	0.038	1. Describe harvest rates by fishery for specific stocks of interest
			0.027	2. Describe socioeconomic impacts of other fisheries

Figure 9. Framework of goals, objectives and information needs, including adjusted weights of importance, Kodiak-Aleutians non-salmon fisheries unit.

using biological information, since it was necessary to first define stocks and understand their biology before stock dynamics could be determined.

The workgroup discussed several issues related to effective management in prioritizing the two issues identified under Goal 3. Participants felt there was a high level of nonparticipation in subsistence permit reporting due to confusion and mistrust. Many people are not aware of differences between Federal and State regulations and permit requirements. Even when subsistence harvests were reported, different classification methods for non-salmon species led to inaccurate harvest estimates. The workgroup recognized difficulties in correctly categorizing harvests since many people obtained non-salmon fishes for subsistence uses during sport and commercial fishing activities. This confusion became evident in workgroup discussions concerning rainbow/steelhead trout. No customary and traditional use determination for rainbow/steelhead trout has been made for Federally qualified subsistence users in the Kodiak area, although this species can retained for subsistence uses if taken incidentally in subsistence net fisheries. Therefore, this species is most commonly taken for subsistence uses under State sport fishing regulations. The workgroup decided that developing and evaluating management strategies for subsistence fisheries was more important (Objective 3A, 9.5% of total weight) than assessing impacts of other fisheries (Objective 3B, 6.5%; Figure 9).

Information Needs Workgroup participants identified fewer information needs for the non-salmon (16) than for the salmon (22) fisheries unit (Figures 4 and 9). Information needs identified for Objectives 1A, 3A, and 3 B were identical to those identified for corresponding objectives within the salmon fisheries unit (Objectives 2A, 3A, and 3B). Under Objective 1B, participants felt it was only necessary to periodically (three to five years) monitor non-salmon subsistence fisheries. They did not see a need to obtain information to improve reporting systems or independently verify harvest data since a standard reporting system for these species needed to be developed,. Under Objective 1C, participants saw no need to build process based models to predict future use patterns. Finally, information needs under Goal 2 differed from those identified for the similar salmon fisheries unit goal (Goal 1) since management of non-salmon fisheries is not based on achieving spawning escapements. Overall, discussions concerning information need priorities for the non-salmon fisheries unit were similar to, but shorter than those conducted for information need priorities for the salmon fisheries unit.

For Goal 1, the workgroup ranked the top three information needs as (Figures 9 and 10):

- Identify factors affecting subsistence harvest levels (13.4% of total weight);
- Periodically (three to five years) estimate subsistence use, harvest and effort by location, gear type, species and date (11.4%); and
- Describe current and traditional methods and means by species and area (9.5%).

For Goal 2, the workgroup ranked the top three information needs as (Figures 9 and 11):

- Identify stocks (9.0% of total weight);
- Estimate abundance and composition (7.2%); and
- Characterize life history, distribution and timing (6.5%).

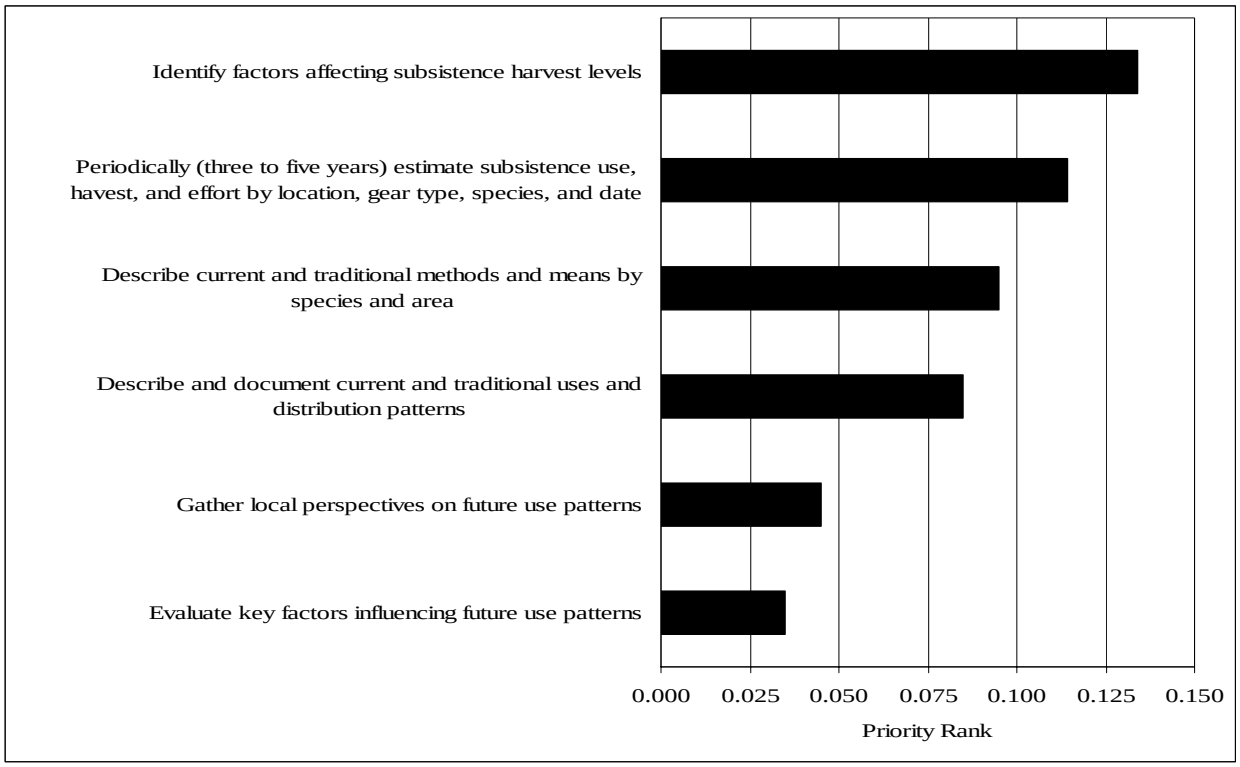

Figure 10. Priority of information needs for Goal 1: Assess and monitor Federal subsistence fisheries to document subsistence uses, Kodiak-Aleutians non-salmon fisheries unit.

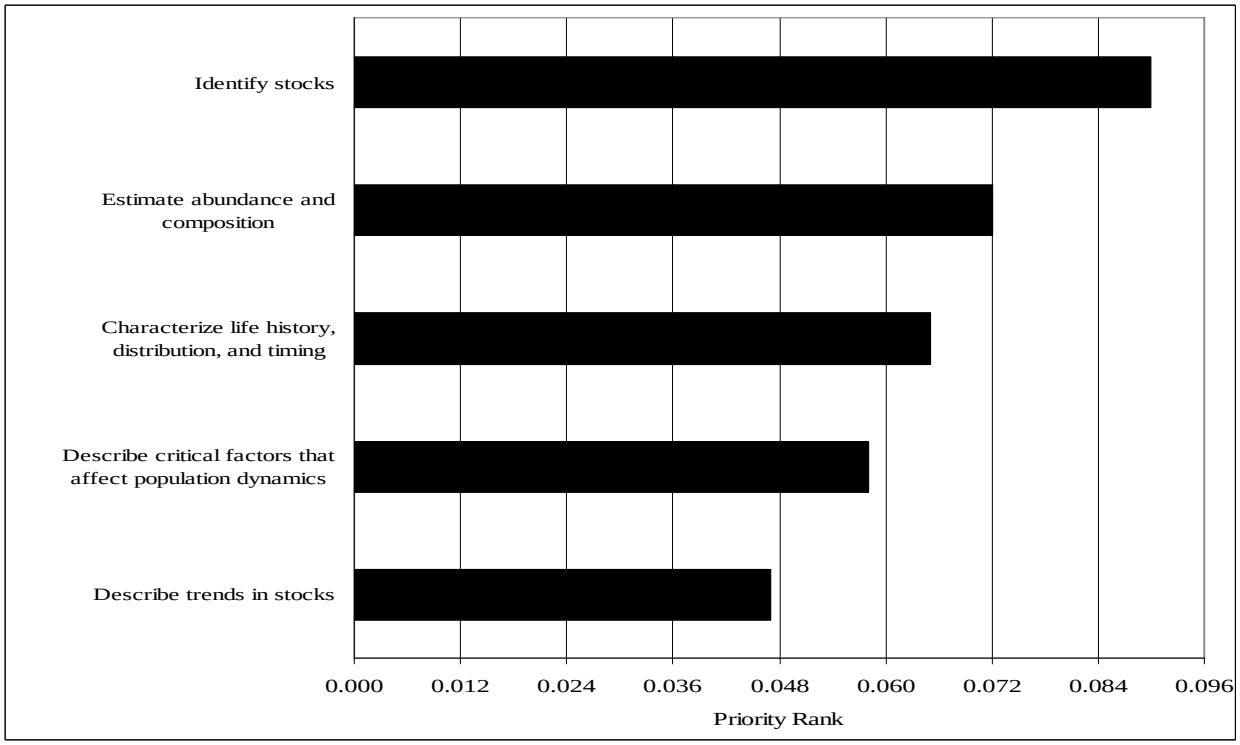

Figure 11. Priority of information needs for Goal 2: Obtain biological information to provide for Federal subsistence fisheries, Kodiak-Aleutians non-salmon fisheries unit.

For Goal 3, the workgroup ranked the top three information needs as (Figures 9 and 12):

- Develop real time information sharing among user groups and agencies (3.8% of total weight; tied for first place);
- Describe harvest rates by fishery for specific stocks of interest (3.8%; tied for first place); and
- Examine the effectiveness of current regulations for Federal subsistence harvest (3.2%).

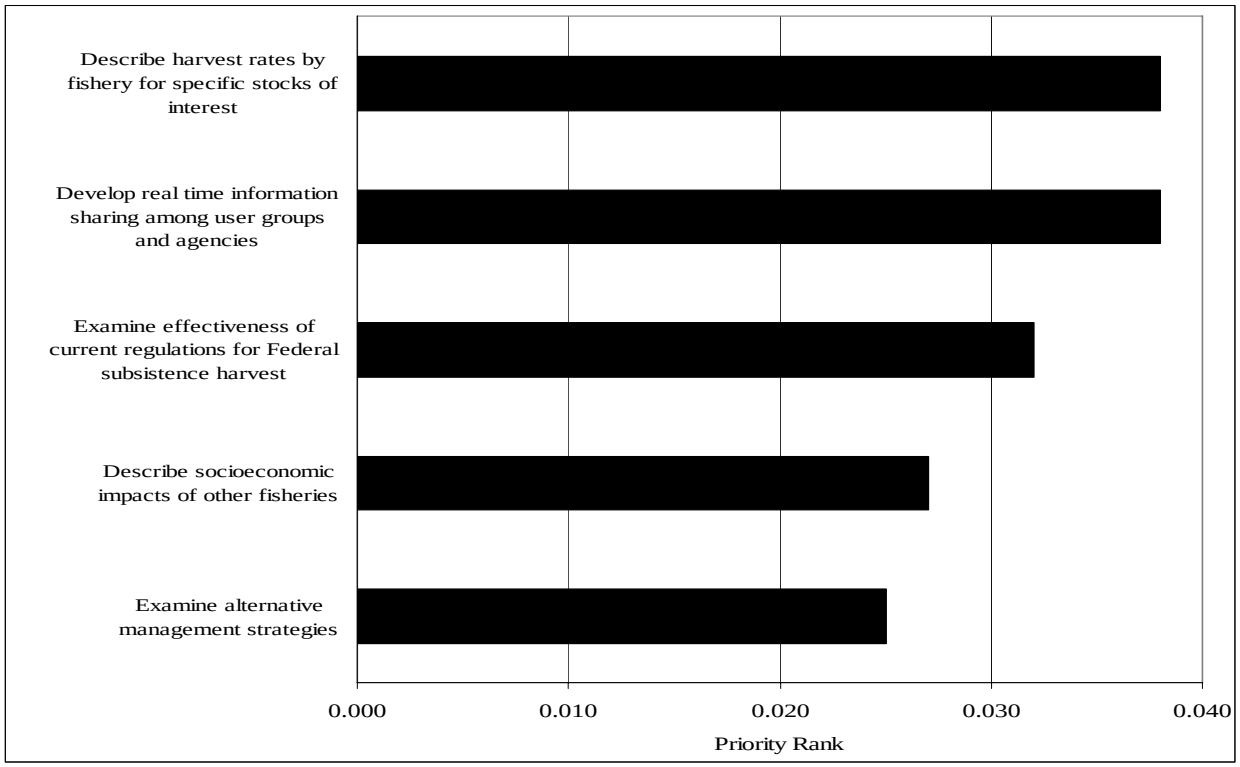

Figure 12. Priority of information needs for Goal 3: Effective management to provide for Federal subsistence uses, Kodiak-Aleutians non-salmon fisheries unit.

For the entire framework, the top five ranked information needs represent 51.8% of the total weight (Figure 13):

- Identify factors (environmental, demographic, regulatory, cultural and socioeconomic) affecting subsistence harvest levels (13.4% of total weight; Goal 1);
- Periodically (three to five year intervals) estimate subsistence use, harvest and effort by location, gear type, species, and date (11.4%; Goal 1);
- Describe current and traditional methods and means by species and area (9.5%; Goal 1);

- Identify stocks (9.0%; Goal 2); and
- Describe and document current and traditional uses and distribution practices (8.5%; Goal 1).

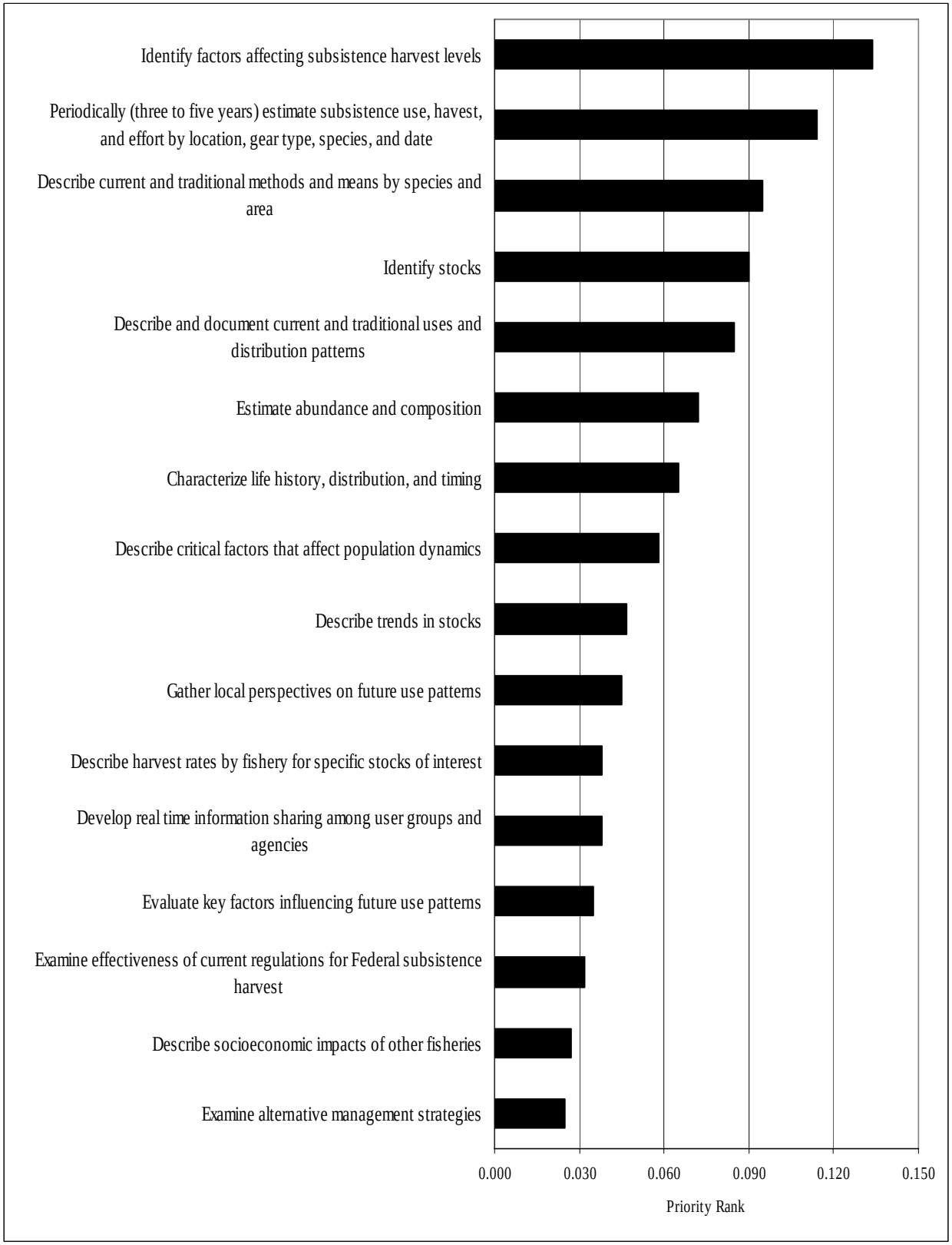

Figure 13. Adjusted synthesis of all 16 information needs, Kodiak-Aleutians non-salmon fisheries unit.

The top five ranked information needs encompass the highest priority need within Goals 1 and 2 as well as the second and third highest priority needs within Goal 1 (Figures 9 and 13). No information needs from Goal 3 are included within the group. Priority rankings of information needs sharply decline after the first five top ranked needs, with the remaining 11 accounting for almost same total weight (48.2%) as the first five (51.8%).

There was insufficient information contained in the list of Council comments (Appendix E) to compare with priorities identified by the workgroup. Adak Island steelhead trout, which has now been grouped within the same genus as Pacific salmon by biologists, was the only non-salmon species contained within the Council list. While the Council was not aware of any specific harvest or conservation concerns associated with Adak Island steelhead trout, they felt the lack of information might jeopardize sustainability of this resource and continued subsistence use.

INFORMATION INVENTORY AND KNOWLEDGE GAP ANALYSIS

METHODS

Participants

Fifteen participants attended the three-day November 2005 workshop, and 11 of these were also able to attend the two-day May 2006 workshop (Appendix D). All 15 participants were given the opportunity to review and comment on this report.

Information Inventory and Knowledge Gap Analysis

An inventory of all relevant past and present studies for each information need was drafted after the first workshop by the workshop chairs, and then reviewed and modified by participants during the second workshop. The completed information inventory for each fisheries unit was documented in a spreadsheet organized according to plan frameworks. For each study, the spreadsheet contains a title, report citations, the location, lead agency or organization, a primary contact person, species addressed, specific activity summary, and duration.

The knowledge gap analysis was based on the information inventory, and an initial draft for each information need was also done prior to the second workshop by the chairs. Standardized responses were used to characterize both what is known and what needs to be done for subsistence fisheries management and assessment (Table 5). The current state of knowledge was classified as “adequate”, “incomplete”, or “lacking”. Recommendations on what needs to be done were classified as either “do not consider proposals” or “consider proposals”.

At the workshop, participants provided a broad base of expertise to review and further develop the information inventory across organizations and funding sources as well as to complete the knowledge gap analysis. Subgroups were formed for each goal within each fisheries unit. Subgroups, and then the workgroup, made two assessments for each information need. Using the information inventory, they first summarized the current state of knowledge for each information need, and then provided a recommendation on the action needed to address each

Table 5. Standardized responses for assessments by information need, Kodiak-Aleutians knowledge gap analysis.

Current state of knowledge	What needs to be done?
Knowledge is adequate Situation: There is little uncertainty regarding this information need. The existing program provides sufficiently accurate and timely information to give meaningful guidance to managers.	**Do not consider proposals** Reason: Studies that address this need are in place or have been completed. Funding is committed and adequate through the next funding cycle. **Consider proposals** Reason: Continued information collection is needed, but funding is not committed or is inadequate to address this information need through the next funding cycle.
Knowledge is incomplete Situation: There is some uncertainty regarding this information need. The existing program provides some useful information; however, information may need to be updated or existing studies may need to be improved to give better guidance to managers.	**Do not consider proposals** Reason: Studies that address this need are either in place or have been completed. Funding is committed and adequate through the next funding cycle. While improvements may be possible, circumstances do not warrant additional studies. **Consider proposals** Reason: Funding is not committed or is inadequate to address this information need through the next funding cycle. Circumstances warrant improvement of existing studies or conduct of additional studies to increase knowledge.
Knowledge is lacking Situation: There is much uncertainty regarding this information need. The existing program provides little or no information. Few, if any, studies have been conducted; or study results are inadequate to give meaningful guidance to managers.	**Do not consider proposals** Reason: While there is a lack of information, it is either highly unlikely existing methods can be successfully applied, or circumstances do not warrant additional studies. **Consider proposals** Reason: Funding is not committed or is inadequate to address this information need through the next funding cycle. Circumstances warrant improvement of existing studies or conduct of additional studies to increase knowledge.

information need. Even if knowledge was judged to be adequate, proposals may need to be considered in 2008 when there is an annual need for this information and funding has not been secured for 2008 and beyond. Conversely, even if knowledge is incomplete or lacking, proposals may not need to be considered in 2008, if additional information is not needed to guide Federal subsistence management.

RESULTS AND DISCUSSION

Salmon Subsistence Fisheries Unit

For the salmon fisheries unit, the workgroup identified a total of 135 study topics that have relevance to information needs identified in the strategic plan (Appendix F). Some studies pertain to an information need at a specific location for a single species (for example, study 6: "Assessment of Buskin River sockeye salmon"), while others have general relevance to all salmon species on a larger scale (for example, study 106: "Statewide subsistence fisheries harvest monitoring strategy"). Several studies address more than one information need, and some studies address information needs under more than one goal. Studies are not evenly distributed among information needs. No studies were identified for any of the information needs under Goal 2 ("Assess and monitor Federal subsistence fisheries to document uses") for Objective C ("Project future use patterns"). About 69% of the 135 studies (93) relate to Goal 1, which contains 36% (8) of the 22 information needs; about 10% of the studies (14) relate to Goal 2, which contains 41% (9) of the information needs; and about 36% of the studies (48) relate to Goal 3, which contains 23% (5) of the information needs.

Using the information inventory (Appendix F), the workgroup identified knowledge gaps for Federal management of Kodiak-Aleutians subsistence salmon fisheries (Table 6 and Appendix G). The workgroup judged the state of knowledge for at least one species or management area to be "adequate" for 12, "incomplete" for 17, and "lacking" for 6 information needs.

Knowledge gap analysis results (Table 6) were used in conjunction with importance ranking of information needs (Figures 4 and 8) to identify the highest strategic priorities for the salmon fisheries unit. Results show that proposal solicitation for 2008 could include 13 information needs (Figure 14). These include the top four as well as the twentieth and twenty-first information needs, and together represent 65.1% of the structurally adjusted total weight of all information needs within this fisheries unit. The top five information needs for 2008 proposals are: 1) Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date for the Alaska Peninsula and Aleutian Islands management areas; 2) Estimate abundance of total run by species and river/lake system for coho and small runs of sockeye salmon; 3) Obtain reliable estimates of spawning escapement over time for coho and small runs of sockeye salmon; 4) Identify factors affecting subsistence harvest levels; 5) Identify critical factors that affect population dynamics of coho salmon.

Non-salmon Species Fisheries Unit

For the non-salmon fisheries unit, the workgroup identified a total of 28 study topics that have relevance to information needs identified in the strategic plan (Appendix H). As was noted for the salmon fisheries unit, some studies pertain to an information need at a specific location for a

Table 6. Summary of state of knowledge (knowledge gap analysis) and decisions on whether to consider Monitoring Program study proposals for Kodiak-Aleutians salmon fisheries unit information needs. Decisions will be used for 2008 Request for Proposals, but may change in succeeding years based on knowledge gap analysis reassessment.

Information Need	State of Knowledge			Consider Proposals
	Adequate	Incomplete	Lacking	
1A1. Estimate abundance of total run by species and river/lake system				
Chinook, chum, pink, and large sockeye salmon runs	X			No
coho and small sockeye salmon runs		X		**Yes**
1A2. Obtain reliable estimates of spawning escapement over time				
Chinook, chum, pink, and large sockeye salmon runs	X			No
coho and small sockeye salmon runs		X		**Yes**
1A3. Determine adult run timing and migration patterns by stock, size, and age				
run timing by stock	X			No
run timing by size and age		X		No
1A4. Define and catalog management units for subsistence	X			No
1B1. Identify critical factors that affect population dynamics				
sockeye salmon	X			No
coho salmon		X		**Yes**
Chinook, chum, and pink salmon		X		No
1B2. Describe relationship between escapement and production				
adult production for all species	X			No
smolt production for sockeye and coho salmon		X		**Yes**
smolt production for Chinook, chum, and pink salmon			X	No
1B3. Determine quantity of salmon by river/lake system needed to sustain ecosystem functions		X		No
1B4. Relate historic salmon harvests to current productivity levels of river/lake systems				
sockeye salmon	X			No
coho, Chinook, chum, and pink salmon			X	No
2A1.Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
2A2. Improve reporting systems for Federal subsistence harvests				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
2A3. Independently verify harvest data				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
2B1. Identify environmental, demographic, regulatory, cultural, and socioeconomic factors affecting subsistence harvest levels			X	**Yes**
2B2. Describe current and traditional methods and means by species and area				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
2B3. Describe and document current and traditional uses and distribution practices				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
2C1. Gather local perspectives on future use patterns			X	**No**

-continued-

Table 6 Continued.

Information Need	State of Knowledge			Consider Proposals
	Adequate	Incomplete	Lacking	
2C2. Evaluate key factors influencing future use patterns			X	**Yes**
2C3. Build process based models to predict future use patterns			X	No
3A1. Examine effectiveness of current regulations for subsistence harvests	X			No
3A2. Develop real-time information sharing among user groups and agencies		X		No
3A3. Examine alternative management strategies		X		No
3B1. Describe socioeconomic impacts of other fisheries		X		**Yes**
3B2. Describe harvest rates by fishery for specific stocks of interest				
sockeye, coho, and Chinook salmon		X		**Yes**
chum and pink salmon	X			No

single species (for example, study 14: "Buskin River Dolly Varden"), while others have general relevance to many species on a larger geographic scale (for example, study 1: "Subsistence harvests by Kodiak Island Borough communities"). Several studies address more than one information need, and some studies address information needs under more than one goal. Studies are not evenly distributed among information needs. No studies were identified for any of the information needs under Goal 1 ("Assess and monitor Federal subsistence fisheries to document uses") for Objective C ("Project future use patterns"). About 39% of the 28 studies (11) relate to Goal 1, which contains 38% (6) of the 16 information needs; about 43% of the studies (12) relate to Goal 2, which contains 31% (5) of the information needs; and about 60% of the studies (17) relate to Goal 3, which contains 31% (5) of the information needs.

Using the information from the study inventory (Appendix H), the workgroup identified knowledge gaps for Federal management of Kodiak-Aleutians subsistence non-salmon fisheries (Table 7 and Appendix I). The workgroup judged the state of knowledge for at least one species or management area to be "adequate" for 4, "incomplete" for 12, and "lacking" for 3 information needs.

Knowledge gap analysis results (Table 7) were used in conjunction with importance ranking of information needs (Figures 9 and 13) to identify the highest strategic priorities for the non-salmon fisheries unit. Results show that proposal solicitation for 2008 could include eight information needs (Figure 15). These include the first as well as the thirteenth information needs, and together represent 61.4% of the structurally adjusted total weight of all information needs within the non-salmon fisheries unit. The top five information needs for 2008 are: 1) Identify factors affecting subsistence harvest levels; 2) Describe current and traditional methods and means by species and area for the Alaska Peninsula and Aleutian Islands management areas; 3) Identify stocks of Dolly Varden/Arctic char; 4) Describe and document current and traditional uses and distribution practices for the Alaska Peninsula and Aleutian Islands management areas; 5) Estimate abundance and composition for the Alaska Peninsula and Aleutian Islands Dolly Varden.

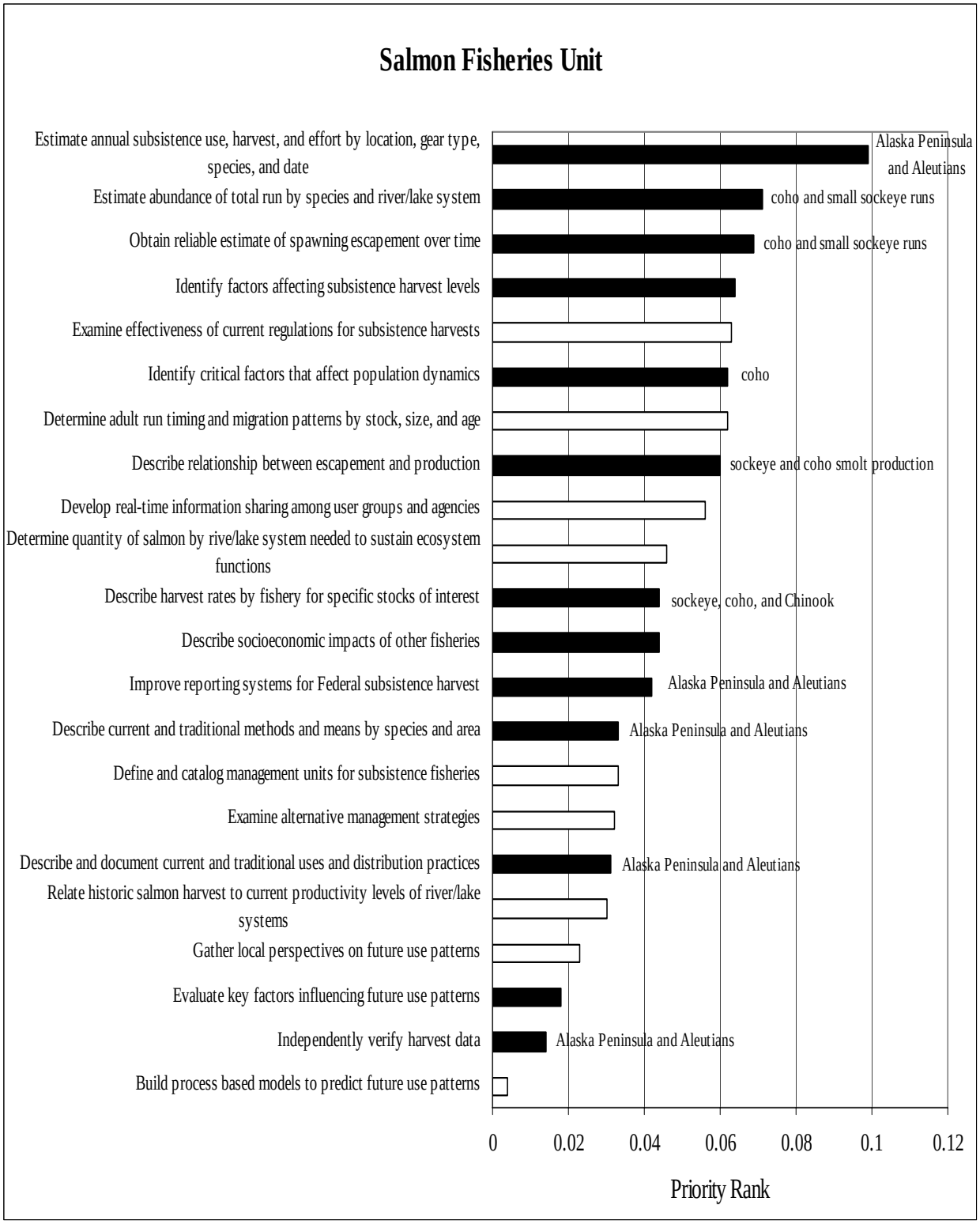

Figure 14. Knowledge gap analysis results showing information needs for which proposals should either be considered (black bars) or not considered (open bars) for the structurally adjusted Kodiak- Aleutians salmon fisheries unit planning framework. See Table 1 for the most important stocks to study.

Table 7. Summary of state of knowledge (knowledge gap analysis) and decisions on whether to consider Monitoring Program study proposals for Kodiak-Aleutians non-salmon fisheries unit information needs. Decisions will be used for 2008 Request for Proposals, but may change in succeeding years based on knowledge gap analysis reassessment.

Information Need	State of Knowledge			Consider Proposals
	Adequate	Incomplete	Lacking	
1A1. Identify environmental, demographic, regulatory, culture, and socioeconomic factors affecting subsistence harvest levels			X	**Yes**
1A2. Describe current and traditional methods and means by species and area				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
1A3. Describe and document current and traditional uses and distribution practices				
Kodiak	X			No
Alaska Peninsula and Aleutians		X		**Yes**
1B1. Periodically (three to five years) estimate subsistence use, harvest, and effort by location, gear type, species, and date	X			No
1C1. Gather local perspectives on future use patterns			X	No
1C2. Evaluate key factors influencing future use patterns			X	**Yes**
2A1. Identify stocks				
rainbow/steelhead trout	X			No
Dolly Varden/Arctic char		X		**Yes**
2A2. Estimate abundance and composition				
rainbow/steelhead trout		X		No
Dolly Varden/Arctic char for Kodiak		X		No
Dolly Varden/Arctic char for Alaska Peninsula and Aleutians		X		**Yes**
2A3. Characterize life history, distribution, and timing				
rainbow/steelhead trout		X		No
Dolly Varden/Arctic char for Kodiak		X		No
Dolly Varden/Arctic char for Alaska Peninsula and Aleutians		X		**Yes**
2B1. Describe critical factors that affect population dynamics				
rainbow/steelhead trout		X		No
Dolly Varden/Arctic char		X		No
2B2. Describe trends in stocks				
rainbow/steelhead trout		X		No
Dolly Varden/Arctic char		X		No
3A1. Develop real-time information sharing among user groups and agencies		X		No
3A2. Examine effectiveness of current regulations for subsistence harvests		X		No
3A3. Evaluate alternative management strategies		X		No
3B1. Describe harvest rates by fishery for specific stocks of interest		X		**Yes**
3B2. Describe socioeconomic impacts of other fisheries		X		No

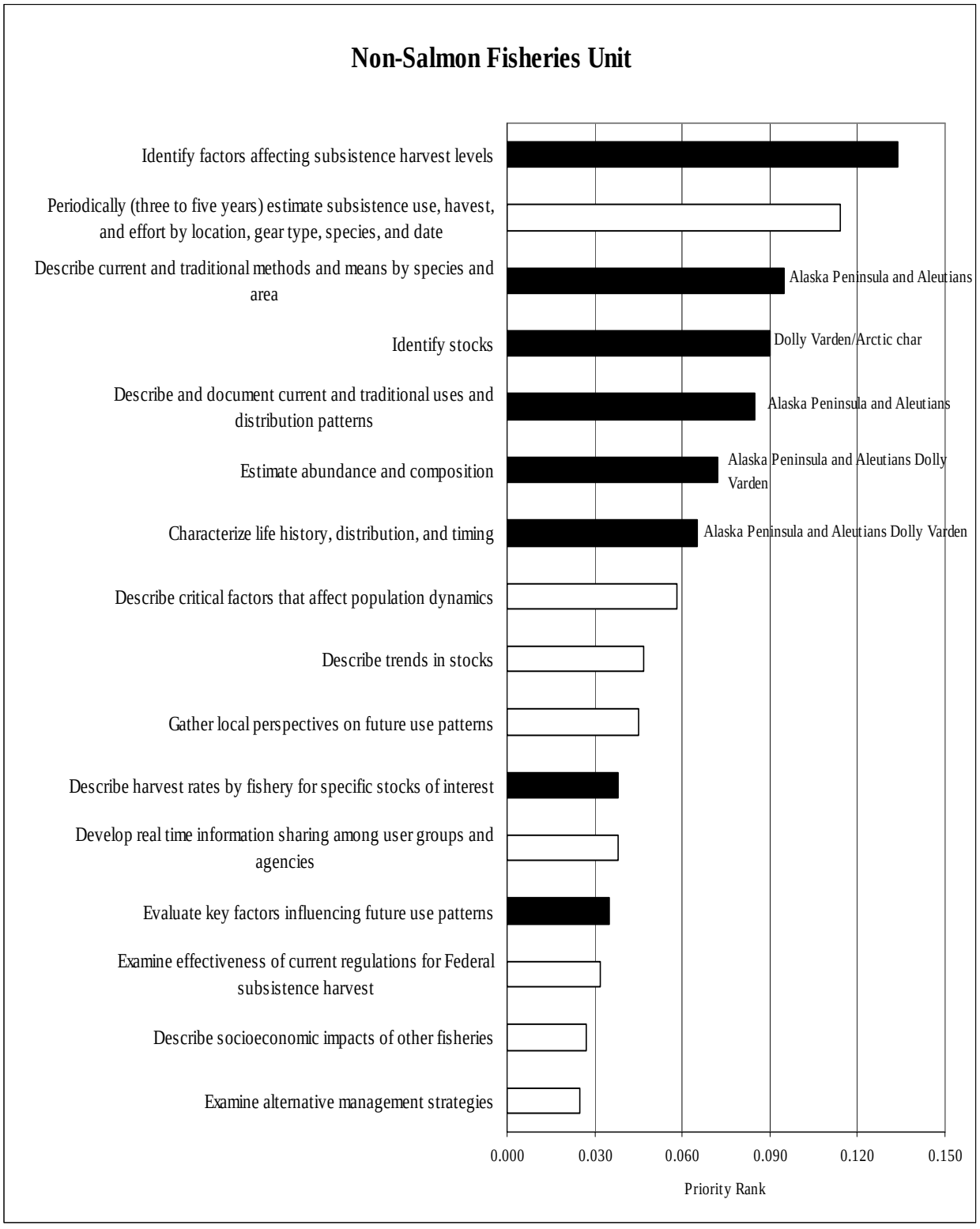

Figure 15. Knowledge gap analysis results showing information needs for which proposals should either be considered (black bars) or not considered (open bars) for the structurally adjusted Kodiak-Aleutians non-salmon fisheries unit planning framework. See Table 1 for the most important stocks to study.

CONCLUSIONS

This strategic plan was developed by stakeholder and agency experts for this area, and was available for public review through the Regional Advisory Council process. The final plan provides an explicit and rigorously developed basis for investigators, the Technical Review Committee, the Council, and the Federal Subsistence Board to focus Monitoring Program funding on the highest informational priorities in the Kodiak, Alaska Peninsula, and Aleutian Islands management areas. While the plan is envisioned as having a 3-5 year time horizon, information inventories and knowledge gap analyses will be updated annually and unanticipated information needs, such as those resulting from resource conservation and fishery problems, will continue to be addressed. This provides a stable yet flexible mechanism to identify strategic priorities for information in each year's Annual Monitoring Plan.

Major achievements from the planning workshops were:

- Development of planning frameworks for two subsistence fishery units;
- Prioritization of goals, objectives, and information needs for each fisheries unit;
- Preparation of information inventories and knowledge gap analyses for each fisheries unit; and
- Formulation of prioritized information needs lists for both each fisheries unit.

Additional results were:

- Increased knowledge of research and management concerns fostered through facilitated discussions;
- Development of a dialog among participants; and
- Learning a systematic approach to planning and problem-solving.

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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 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 studies 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.

Appendix A. Continued

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. Members of the Technical Review Committee for the Fisheries Research Monitoring Program, July 2006.

Organization	Name	Phone	E-mail
U.S. Fish and Wildlife Service (Office of Subsistence Management)	Steve Klein (Chair)	786-3612	steve_klein@fws.gov
Bureau of Indian Affairs	Pat Petrivelli	786-3361	No email
Bureau of Land Management	Dennis Tol	271-3348	dennis_tol@ak.blm.gov
U.S. Fish and Wildlife Service	Jeff Bromaghin	786-3559	jeff_bromaghin@fws.gov
National Park Service	Dave Nelson	644-3529	dave_nelson@nps.gov
U.S. Forest Service	Cal Casipit	586-7918	ccasipit@fs.fed.us
Alaska Dept. of Fish and Game, Div. of Subsistence	Marianne See	465-4147	marianne_see@fishgame.state.ak.us
Alaska Dept. of Fish and Game, Div. of Comm. Fisheries	Gene Sandone	267-2115	gene_sandone@fishgame.state.ak.us
Alaska Dept, of Fish and Game, Div. of Sport Fish	Dave Bernard	267-2380	david_bernard@fishgame.state.ak.us
Minerals Management Service	Dee Williams	334-5283	dee.williams@mms.gov

Appendix C. A glossary of terms and phrases from discussions in the development of a strategic plan to support the Fisheries Resource Monitoring Program in the Kodiak-Aleutians area.

AHP - Acronym for Analytic Hierarchy Process.

ANILCA - Acronym for Alaska National Interest Lands Conservation Act.

Capacity building - Providing opportunities for rural residents, communities, and organizations to participate in planning, conducting, and applying information from Monitoring Program studies; as well as providing opportunities for managers to work with and understand subsistence user concerns.

Customary trade - The cash trade of fish or fish parts between subsistence fishers and other individuals. This practice has a long history, is poorly documented, is allowed under Federal regulations for fishes harvested on Conservation Units, but is illegal under State regulations.

Escapement - Pacific salmon that escape harvest within a fishery and enter freshwater systems to spawn.

Fishing effort - The total fishing gear used for a specified time period. This factor is poorly documented for subsistence fisheries, particularly since fishers often do not record time periods on permits when they fished and made no harvest.

Expert judgment - A conclusion based on previous relevant experience supported by rationale thought and knowledge.

Federal nexus - A connection or link associating a study with Federal subsistence fishery management. Studies concerning fisheries or fish stocks occurring within or adjacent to federally managed lands and waters (referred to as Conservation Units) have a Federal nexus and can be considered for Monitoring Program funding. The strength of the Federal nexus plays an important role determining whether a proposed study will receive funding. For example, studies concerning the high seas harvest of salmon stocks spawning within Conservation Units would be considered for Monitoring Program funding, but would be unlikely to receive funding since it would be difficult to show effects on Federal subsistence fishery management.

Fishery interactions - The effects commercial and sport fisheries have on subsistence fisheries, including subsistence fishery interruptions, displacement of subsistence fishers, changes in subsistence fishing patterns or methods, and alterations of social and economic conditions affecting subsistence fishing.

Goals - Long term achievements that contribute to accomplishing the mission of a program or study.

Harvest rate - Number or weight of fishes harvested during a specified time.

Appendix C. Continued

Information need - A specific issue, impediment to overcome, data gap, or uncertainty associated with a subsistence resource or fishery.

Management Unit - The fish stock or group of stocks which form the basis for harvest management. Definitions have been based on various factors, including run timing, geographic area, genetics, and morphology.

Mission - The overall purpose of a program that is met by achievement of long term goals and specific objectives.

Objective - measurable statement of purpose.

Paradigm - A philosophical or theoretical framework of any kind. In science, a generally accepted model of how ideas relate to one another, forming a conceptual framework within which research is conducted and theories, laws, and generalizations are formulated and carried out.

Past – intended to convey the concept of traditional.

Population - A group of similarly adopted, interbreeding fish of the same species.

Salmon stock - A fish population or a portion of a fish population consisting of a locally interbreeding group of fish that is distinguished from other groups of the same species by a combination of genetic, phenotypic, life history, and habitat characteristics.

Strategy – A plan developed to achieve a desired outcome.

Sustainable fish population – A group of fish managed so that their abundance and other biological attributes will be maintained over a long time period. To accomplish this, ecosystem function must also be maintained.

Appendix D. Participants in Kodiak-Aleutians strategic planning workshops. All 15 listed participants attended the November 1-3, 2005, workshop, and 11 of these (marked with an asterisk next to their name) were also able to attend the May 4-5, 2006, workshop.

Organization	Name	Phone	E-mail
ADFG, Div. Subsistence	Liz Williams*	267-2119	liz_williams @fishgame.state.ak.us
ADFG, Div. Comm. Fish	Steve Honnold*	486-1873	steve_honnold@fishgame.state.ak.us
ADFG, Div. Sport Fish	Dan Sharp*	267-2186	dan_sharp@fishgame.state.ak.us
BIA	Pat Petrivelli*	786-3361	No email
Kodiak Area Native Assoc.	Iver Malutin	486-9898	shannonkita@kanaweb.org
K-A Reg. Advisory Council	Mitch Simeonoff*	836-2345 (fax)	No email
K-A Reg. Advisory Council	Richard Zacharof*	546-3200	rzacharof@tdxak.com
K-A Reg. Advisory Council	Peter Squartsoff*	454-2333	No email
UAF/ACFWRU	Joe Margarf	474-7661	ffjfm1@uaf.edu
Unga Corp/Ak Pen. Setnet Assoc	Edgar Smith	424-3847	No email
USFWS/King Salmon Office	Mike Edwards*	246-3442	mike_edwards@fws.gov
USFWS/Kodiak NWR	Kevin VanHatten	487-2600	kevin_vanhatten@fws.gov
USFWS/OSM-CRD	Michelle Chivers*	786-3877	michelle_chivers@fws.gov
USFWS/OSM-FISD	Amy Craver* (co-chair)	786-3875	amy_craver@fws.gov
USFWS/OSM-FISD	Stephen Fried* (co-chair)	786-3824	stephen_fried@fws.gov

Support Staff:

[1]Facilitator (contractor)	Peggy Merritt	457-5911	pmerritt@ak.net
Software (OSM-FISD)	Beth Spangler	786-3325	beth_spangler@fws.gov
Computers	Vince McClain	786-3886	vince_mcclain@fws.gov
Notetakers	Kathleen Orzechowski	786-3645	kathleen_orzechowski@fws.gov
	Carmen Croas	786-3634	carmen_croasi@fws.gov

1 Resource Decision Support

Appendix D. Continued.

Affiliations and responsibilities of Kodiak-Aleutians strategic planning workshop participants.

Michelle Chivers: Ms. Chivers is a Regional Coordinator with U.S. Fish and Wildlife Service, Office of Subsistence Management, Coastal Regions Division, and provides support for the Federal subsistence regulatory process, including the inter-agency Staff Committee, Regional Advisory Councils, and Federal Subsistence Board. She serves as the primary contact between the Kodiak-Aleutians Council and regional office staff of the five Federal agencies involved in subsistence issues, and makes all arrangements for and provides support during Council meetings.

Amy Craver: Ms. Craver is an anthropologist with U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Information Services Division, and is responsible for administering and providing technical oversight for harvest monitoring and traditional ecological studies in the Southwest (Bristol Bay, Chignik, Alaska Peninsula, Kodiak, and Aleutian Islands) and Northern (Seward Peninsula, Northwest Arctic, and North Slope) regions for the Fisheries Resource Monitoring Program.

Mike Edwards: Mr. Edwards is a fishery biologist with U.S. Fish and Wildlife Service, King Salmon Fish and Wildlife Field Office, and assists in administering the Service's fisheries program in Southwest region. He has served as an investigator on Fisheries Resource Monitoring Program projects.

Stephen Fried: Dr. Fried is a fishery biologist with U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Information Services Division, and is responsible for administering and providing technical oversight for fisheries stock status and trends studies in the Southwest Region for the Fisheries Resource Monitoring Program.

Steve Honnold: Mr. Honnold is Regional Finfish Research Supervisor for Westward Region, Alaska Department of Fish and Game, Commercial Fisheries Division, and supervises the monitoring and management of commercial and marine personal use and subsistence fisheries. He and his staff have served as investigators on various Fisheries Resource Monitoring Program projects.

Iver Malutin: Mr. Malutin is a member of Koniag, Inc. and the Kodiak Area Native Association and has a long history of active involvement in various planning efforts for the Kodiak and Afognak areas including membership and involvement with the Alaska Native Subsistence Halibut Working Group; Oil Spill Geographic Response Strategies Workgroup; Advisory Committee for National Resource Center for American Indian, Alaska Native, and Native Hawaiian Elders; and Alaska Commission on Aging. He was recently nominated for the Kodiak area Elder of the Year Award, but declined because at 74 he thought he was "too young."

Appendix D. Continued.

Affiliations and responsibilities of Kodiak-Aleutians strategic planning workshop participants.

Joe Margraf: Dr. Margraf is Leader of the Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks, which is a partnership among Federal and State agencies and academia and provides a strong link between U.S. Geological Survey and both Federal and State management agencies. He is a fishery biologist and conducts research, education and outreach emphasizing Alaska natural resource management, and also provides information and trained personnel to help implement management.

Pat Petrivelli: Ms. Petrivelli is an anthropologist with Bureau of Indian Affairs, Alaska Regional Office, Subsistence Branch and assists with administering and managing a wide range of functions and services for Alaska Natives. She serves as a member of the Technical Review Committee for the Fisheries Resource Monitoring Program and was also a former staff member of the Office of Subsistence Management.

Dan Sharp: Mr. Sharp is Regional Management Biologist for Kodiak and Bristol Bay, Alaska Department of Fish and Game, Division of Sport Fish, and supervises the monitoring and management of sport and freshwater personal use and subsistence fisheries. His staff has served as investigators on various Fisheries Resource Monitoring Program projects.

Edgar Smith: Mr. Smith is a commercial fisherman, a board member of the Alaska Peninsula Set Association, and a shareholder and active member of Unga Corporation, which is based in Sand Point, Alaska.

Mitch Simeonoff: Mr. Simeonoff is a member of the Kodiak-Aleutians Regional Advisory Council, resides in Akhiok, and is a subsistence fisher.

Peter Squartsoff: Mr. Squartsoff is a member of the Kodiak-Aleutians Regional Advisory Council, resides in Port Lions, and is both a subsistence fisher and professional sport fishing guide.

Kevin VanHatten: Mr. VanHatten is a fishery biologist and pilot, U.S. Fish and Wildlife Service, Kodiak National Wildlife Refuge, and administers the fisheries program for this refuge.

Liz Williams: Ms. Williams was an anthropologist for Southcentral Region with Alaska Department of Fish and Game, Division of Subsistence, and was responsible for monitoring and assessing subsistence fisheries. She has served as an investigator for Fisheries Resource Monitoring Program projects. Ms. Williams recently accepted a position as an anthropologist with U.S. Fish and Wildlife Service, Office of Subsistence Management.

Richard Zacharof: Mr. Zacharof is a member of the Kodiak-Aleutians Regional Advisory Council, resides on St. Paul Island, and is a subsistence fisher.

Appendix E. A list of subsistence information needs and issues, organized by data type, identified by the Kodiak-Aleutians Regional Advisory Council, 2002-2006.

Stock Status and Trends

1. Salmon Stock Assessment and Monitoring
   - Afognak Lake, Afognak Island, Sockeye Salmon
   - Buskin River, Kodiak Island (Kodiak), Sockeye Salmon
   - Akalura Lake, Kodiak Island (Olga Bay), Sockeye and Coho Salmon
   - Horse Marine Lagoon and Lake, Kodiak (Olga Bay), Coho and Sockeye Salmon
   - Moser Bay-Ship Cove, Kodiak Island (Olga), Pink and Sockeye Salmon
   - Silver Salmon Creek, Kodiak Island (Olga Bay), Coho Salmon
   - Big Creek, Kodiak Island (Old Harbor), Coho Salmon
   - Mortensens Creek, Cold Bay, Sockeye and Coho Salmon
   - Thin Point Lake, Cold Bay, Sockeye Salmon
   - Hoodoo Lake (Sapsuk Lake), Nelson Lagoon, Sockeye Salmon
   - Zelda Creek, King Cove (Leonard Harbor) Salmon
   - McLees Lake, Unalaska Island (Reese Bay), Sockeye Salmon
   - Unalaska Lake, Unalaska Island, Sockeye Salmon
   - Nikolski Bay, Umnak Island, Sockeye and Coho Salmon
   - Atka Island Salmon
   - Kagalaska Island Sockeye Salmon
   - Airport Creek, Adak Island, Coho Salmon
   - Quail Bay, Adak Island, Sockeye Salmon
   - Little Thumb, Adak Island, Chum Salmon and Steelhead
   - Navfac Creel, Adak Island, Pink Salmon
   - Hidden Bay, Adak Island, Sockeye Salmon

2. Concerns for Small Stocks in Mixed Stock Salmon Fisheries - Residents Are Particularly Concerned that Olga Bay Mixed Stock Commercial Harvests of Dog Salmon Creek (Fraser Lake) and Upper Station (Olga Creek and South Olga Lakes) Sockeye Salmon Are Affecting Smaller Stocks Used for Subsistence

3. Fisheries Training Programs for Local Residents

Harvest Monitoring and Traditional Ecological Knowledge

Subsistence Use and Practices

- Documenting Subsistence Uses Prior to Commercial Fisheries Development
- Documenting Subsistence Fishery Needs and Shortages

Appendix F. Information inventory for Kodiak-Aleutians salmon fisheries unit.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A1	**Estimate abundance of total run by species, and river/lake system**					
1	Summary of salmon catch, estimated escapement, total run, and biological attributes of selected salmon catches and escapements (ADFG Regional Information Reports 4K89-21, 4K88-9, 4K88-37, 4K90-21, 4K93-27, 4K94-7, 4K94-30, 4K95-12, 4K95-43, 4K96-40, 4K96-44, 4K97-44, and 4K98-53, 4K05-2; UW School of Fisheries Circular 39)	ADFG - CF P.A. Nelson	Kodiak management area	all	Documentation of catches, escapements, and total runs in Kodiak management area systems, including age, size, and sex information.	1950's, 1988, 1989 1994-1996
2	Salmon harvest and escapement data for the Chiniak Bay and Kodiak road system (ADFG 4K86-08, ADFG Fishery Data Series Report 93-24)	ADFG – SF L. J. Schwarz	Chiniak Bay and Kodiak road system (Buskin has federal nexus)	all	Estimation of escapements and sport fish harvests.	1980-1999
3	Timing, escapement distribution, and catch (ADFG Regional Information Report 4K88-35; UW School of Fisheries Circulars 38, 44, 60, 74, 85, 89, 93, 111, 214, 244, 67-13, 70-6, 70-12, 71-6,72-8, 73-2, 74-3, 76-2, 79-4, 79-5, 80-1, 80-2, 81-5, 82-1, 83-2, 84-3, and 85-2)	ADFG - CF B.A. Johnson	Kodiak Island	all	Estimation of salmon catches and escapements from stream survey counts.	1952-1959, 1962-1964, 1968-1971, 1973-1983, and 1988

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A1	**Estimate abundance of total run by species, and river/lake system (continued)**					
4	Alaska Peninsula-Aleutian Islands area catch and escapement statistics (ADFG Regional Information Report 4K86-08, 4K88-10, 4K88-5, 4K89-13, 4K89-22, 4K90-18, 4K90-19, 4K90-33, 4K91-08, 4K91-18, 4K92-08, 4K97-56, 4K97-4, and 4K05-2)	ADFG - CF J.N. McCullough	Alaska Peninsula and Aleutian Islands	all	Documentation of catches, escapements, and total runs in Alaska Peninsula and Aleutian Islands management area, including age, size, and sex information..	1986-1990, 1997
1A2	**Obtain reliable spawning escapement estimates over time**					
5	Kodiak management area salmon escapement counts for river systems with fish weirs (ADFG Regional Information Report 4K91-27, 4K93-18, 4K93-31, 4K94-41, 4K96-34, 4K96-51, 4K98-43, 4K99-54, 4K00-51, 4K01-9, 4K04-38; ADFG Fishery Management Report 05-47)	ADFG - CF P. Kuriscak	Kodiak	all	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data.	1982-2002
6	Assessment of Buskin River sockeye salmon (FIS 00-032 and 04-414; ADFG Fishery Data Series Report 104; ADFG Federal Aid in Fish Restoration, Annual Performance Reports for Projects F-9-18(27)S-41-2, and F-10-1(27)S-41-2)	ADFG - SF D. Tracy	Buskin River, Kodiak Island, Alaska Maritime NWR	sockeye	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data; examination of escapement and resulting adult production.	1985, 1986, 1988, and ongoing since 2000

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A2 Obtain reliable spawning escapement estimates over time (continued)						
7	Escapement timing and abundance of adult salmonids in the Uganik River (USFWS Alaska Fisheries Technical Report 32)	USFWS - KFWO J.A. Booth	Uganik River, Kodiak NWR	all	Estimation of abundance and escapement timing of adult salmon.	1990-1992
8	Abundance and run timing of adult chum salmon and steelhead kelt in Sturgeon River (USFWS Alaska Fisheries Data Series 99-2 and 2001-2)	USFWS - KFWO M. Price	Sturgeon River, Kodiak NWR	chum and steelhead	Estimation of abundance and escapement timing of adult salmon.	1998-1999
9	Postseason salmon escapement estimates for Karluk and Ayakulik rivers, Red Salmon Lake, and Dog Salmon Creek (ADFG Regional Information Report 4K00-45; ADFG Fishery Data Series Reports 96-6, 97-40, 02-02; UW School of Fisheries Circulars 43 and 59)	ADFG -SF M. Clapsadl	Karluk, Frazer, and Red Salmon lake systems, Kodiak NWR	Chinook and sockeye	Estimate of spawning escapements and collection of age, sex, and length data.	1952, 1953, 1998 and 2000
10	Escapement of coho salmon in selected Kodiak Management Area streams (ADFG Fishery Data Series Reports 3, 71, and 00-9)	ADFG -SF R. N. Begich	American and Olds rivers, Kodiak Island (no federal nexus)	coho	Estimation of salmon escapement from mark-recapture experiments.	1997 and 1998
11	Escapement of salmon into Akalura Lake using video equipment (ADFG Regional Information Report 4K03-31)	ADFG -SF N.H. Sagalkin	Akalura Lake, Kodiak NWR	all	Estimation of salmon escapement using remote video technology.	2003

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A2	**Obtain reliable spawning escapement estimates over time (continued)**					
12	Alaska Peninsula and Aleutian Islands management areas salmon escapement counts for river systems with weirs (ADFG Regional Information Reports 4K92-15, 4K97-4, 4K98-40, 4K99-48, and 4K00-9, 4K01-21, 4K02-26, 4K03-44, and 4K05-3)	ADFG – CF G.M. Watchers	Alaska Peninsula, Aleutians, and Chignik	all	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data.	1986-2005
13	Sockeye salmon escapement into McLees Lake (FIS 01-159 and 04-403)	USFWS - KSFWO M. Edwards	McLees Lake, Unalaska Island, Alaska Maritime NWR	sockeye	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data.	2001-ongoing
14	Sockeye and coho salmon escapement into Mortensen Creek (FIS 01-206 and 04-402)	USFWS - KSFWO M. Edwards	Mortensen Creek, Izembek NWR	sockeye and coho	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data.	2001-ongoing
15	Abundance and run timing of adult Pacific salmon and Dolly Varden in Frosty Creek (USFWS Alaska Fisheries Technical Report Number 74)	USFWS - KSFWO K.K. Cornum	Frosty Creek, Izembek NWR	all and Dolly Varden	Census of salmon passing weir; estimation of escapement timing; collection of age, sex, and length data.	2000-2002
16	Stream life and spawning studies to expand aerial survey counts (ADFG Regional Information Reports 4K88-35, 4K90-21)	ADFG – CF B.A. Johnson	Kodiak Island	pink	Determination of stream life of spawning pink salmon; estimation of salmon spawning escapement from stream survey data.	1988 and 1990

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A2 Obtain reliable spawning escapement estimates over time (continued)						
Also see study numbers 1-4						
1A3 Determine adult timing and migration patterns by stock, sex, size, and age						
17	Kodiak management area salmon escapement and catch sampling (ADFG Regional Information Reports 4K88-9, 4K88-37, 4K91-17, 4K92-25, 4K93-23, 4K94-26, 4K95-37, 4K96-56, 4K98-44, 4K99-44, 4K99-65, 4K00-40, 4K00-56, 4K01-18, 4K01-30, 4K02-5, 4K02-36, 4K03-31, 4K03-43, 4K04-22, 4K04-31)	ADFG – CF M.B. Foster	Kodiak area	all	Documentation of age, size, and sex information for salmon escapements and commercial harvests.	1985-2003
18	Estimated run timing of sockeye salmon stocks on the west and east sides of Kodiak Island (ADFG Regional Information Report 4K78-06, 4K94-6)	ADFG - CF B.M. Barrett	Kodiak Island	sockeye	Documentation of tagging and sockeye salmon run timing.	1978, 1994
19	Time of occurrence of Kodiak Island pink salmon runs (Kodiak Island Memorandum no. 1 - UW School of Fisheries Circular 6)	UW – FRI D.E. Bevan	Kodiak Island	pink	Documentation of pink salmon run timing.	1950
20	Moser-Olga Bay test fishery: research, historical perspective, and management importance (ADFG Regional Information Report 4K86-08, 4K00-29)	ADFG - CF N.H. Sagalkin	Moser-Olga Bay, Kodiak Island	sockeye	Documentation of use of test fishing for fisheries management.	2000

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3	**Determine adult timing and migration patterns by stock, sex, size, and age (continued)**					
21	Alitak Bay test fishery: Research, historical perspective, and management importance (ADFG Regional Information Report 4K89-21, 4K91-17, 4K92-25, 4K93-23, 4K94-26, 4K96-56, 4K98-44, 4K00-40, 4K01-18, 4K02-36, 4K03-31,4K03-43, 4K03-50, 4K04-22, 4K05-5, 4K05-37)	ADFG - CF	Alitak Bay, Kodiak Island	sockeye	Documentation of use of test fishing for fisheries management.	1989, 1991-1994, 2005
22	North Shelikof Strait sockeye salmon catch distribution, timing, and stock composition (ADFG Regional Information Report 4K88-6, 4K91-3, and 4K92-43)	ADFG - CF B.M. Barrett	North Shelikof Strait	sockeye	Documentation of distribution, timing, and stock composition of North Shelikof Strait commercial sockeye salmon harvest.	1988-1992
23	Joshua Green River Pacific Salmon Stock Assessment and Resident Fish Species Survey (USFWS Alaska Fisheries Data Series 2001-3)	USFWS - KSFWO K.S. Whitton	Joshua Green River, Izembek NWR	chum, sockeye, pink, coho, and Dolly Varden	Description of run timing and collection of age, size, and sex information.	1994–1996

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3	**Determine adult timing and migration patterns by stock, sex, size, and age (continued)**					
24	Alaska Peninsula and Aleutian Islands salmon escapement and commercial catch sampling (ADFG Regional Information Reports 4K88-5, 4K88-10, 4K89-13, 4K91-11, 4K92-20, 4K93-20, 4K94-19, 4K95-10, 4K95-17, 4K95-34, 4K96-30, 4K96-36, 4K97-48, 4K98-23, 4K99-41, 4K99-42, 4K00-62, 4K01-8, 4K01-27, 4K02-46, 4K03-35, 4K04-28)	ADFG - CF K.A. Bouwens	Alaska Peninsula and Aleutian Islands	all	Documentation of age, size, and sex information for salmon escapements and commercial harvests.	Alaska Peninsula: 1986-88, 1993-2003 Aleutians: 1986-88, 2000-2003
25	Summary of previously unexamined 1939 salmon tagging study. ADFG Special Publication 05-11)	U.S. BCF J. Barnaby (reported by ADFG-CF A.R. Shaul)	South Alaska Peninsula; Shumagin, Unimak and Akutan islands	all	Examination of adult salmon movements based on tagging in nearshore marine waters and recoveries in marine and fresh waters.	1939
26	Incidence of immature salmon in South Peninsula purse seine fisheries (ADFG Regional Information Report 4K92-17)	ADFG - CF J.N. McCullough	South Alaska Peninsula	sockeye	Occurrence of juvenile sockeye salmon in South Peninsula commercial purse seine harvests.	1963-1991
27	Maturity analysis of salmon caught in the South Peninsula post-June immature test fishery (ADFG Regional Information Report 4K00-75)	ADFG - CF M.B. Foster	South Alaska Peninsula	sockeye	Determination of sockeye salmon sexual maturity in South Peninsula commercial fishery catch samples.	2000

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3	**Determine adult timing and migration patterns by stock, sex, size, and age (continued)**					
28	Survey of fishery resources in the Port Moller-Balboa Bay pipeline corridor (USFWS Alaska Fisheries Technical Report 2)	USFWS - KSFRO T.A. Wagner	Herendeen Bay	all	Documentation of species composition, distribution and condition; determination of salmon run timing; spawning and rearing areas; description of stream characteristics. Used for pipeline corridor selection, alignment, construction timing, and mitigation.	1985-1986
29	Western Alaska Salmon Stock Identification Project	ADFG - CF/CGL J. Seeb	Western Alaska and Bering Sea, including Alaska Peninsula	sockeye, chum	Collection of salmon tissue samples from spawning stocks and marine fisheries, and use of genetic stock identification (most recently single nucleotide polymorphisms - SNPs) to determine distribution, migration, early marine survival, and relative stock abundance of sockeye and chum salmon stocks in the Bering Sea	ongoing

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3 Determine adult timing and migration patterns by stock, sex, size, and age (continued)						
30	North Pacific Anadromous Fish Commission Salmon Tagging	NOAA - NMFS/ABL J. Helle	Bering Sea and Gulf of Alaska	all	Mark and release about 1,000 salmon with plastic discs and electronic tags that record sea temperature, depth, and daily position to determine migratory routes and factors affecting distribution and abundance.	2002-2003
31	High Seas Salmon Research Program	UW - SAFS K. Myers	North Pacific Ocean	all	Coordination of NPAFC research, including studies on Bering Sea salmon migration and food habits; Eastern Bering Sea Chinook salmon stock identification; Global Ocean Ecosystems Dynamics; age and growth of juvenile Chinook salmon in Southeast Alaska coastal marine waters.	ongoing since 1953

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3 Determine adult timing and migration patterns by stock, sex, size, and age (continued)						
32	Bering-Aleutian Salmon International Survey (BASIS) NPAFC	US component - NOAA-NMFS	Bering Sea	all	Description of seasonal stock-specific salmon migration patterns; determination of key biological, climatic, and oceanographic factors affecting long-term changes in salmon food production and growth rates; examination of production and survival trends among salmon populations, salmon production limits and hatchery salmon effects.	ongoing since 2002
33	Use of genetic stock identification to determine distribution, migration, early marine survival, and relative stock abundance of Western Alaska sockeye salmon	NOAA - NMFS/ABL R. Willmot	Bering Sea and Gulf of Alaska	sockeye	Update genetic baseline with Western Alaska sockeye salmon stock data to help identify critical factors affecting population dynamics during marine residency.	2002-2004
Also see study numbers 3 and 5-16						
1A4 Define and catalog management units that sustain subsistence fisheries						
34	Estimation of Karluk Lake early and late run sockeye returns based on scale age data, 1985-1994 (ADFG Regional Information Report 4K95-44)	ADFG - CF B.M. Barrett	Karluk Lake, Kodiak NWR	sockeye	Estimation of early and late runs based on age from scales.	1985-1994

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A4	**Define and catalog management units that sustain subsistence fisheries (continued)**					
35	Identification of Kodiak Island pink salmon populations based on biochemical genetic variation and scale characteristics (FRI-UW Reports 7801, 7908, and 8104)	UW-FRI R.F. Donnelly	Kodiak	pink	Identification of pink salmon stocks based on genetics and scale characteristics.	1978, 1979, and 1981
36	Length-weight relationships of selected sockeye salmon stocks in Kodiak area (ADFG Regional Information Report 4K96-41)	ADFG - CF I.W. Vining	Kodiak	sockeye	Documentation of length-weight relationships for selected stocks.	1996
37	Focal scale resorption in chum salmon from the June South Peninsula fisheries (ADFG Regional Information Report 4K93-2)	ADFG - CF R.L. Murphy	South Alaska Peninsula	chum	Occurrence of chum salmon scales with focal resorption from June commercial fisheries.	1993
38	Genetic baseline data collection and stock identification of sockeye salmon populations from the westward region (ADFG Regional Information Reports 4K92-35, 4K00-40, 4K01-46 and 4K02-34)	ADFG – CF M.J. Witteveen	Kodiak-Aleutians	sockeye	Collection and analysis of genetic baseline information.	1992, 2001& 2002
39	Survey of the fishery resources on Adak Island (USFWS Alaska Fisheries Technical Report 29)	USFWS – KFWFO D.E. Palmer	Adak Island (57 streams and Lake Andrew), Alaska Maritime NWR	all	Documentation of abundance and distribution of juvenile salmon and resident fishes; collection of age, size and sex information; documentation of water quality and spawning and rearing habitat.	1993 and 1994

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A4	**Define and catalog management units that sustain subsistence fisheries (continued)**					
40	Aleutian Islands salmon stock assessment and status (ADFG Regional Information Report 4K97-6)	ADFG - CF P.B. Holmes	Aleutian Islands	all	Documentation of 1982 stock assessment survey and current status of stocks.	1997
41	Genetic stock identification of Alaska Chinook salmon (ADFG Regional Information Report No. 5J96-16)	ADFG - CF/CGL L. Seeb	Alaska	Chinook	Collection of Chinook salmon tissue samples; development of screen for microsatellite loci variation; estimation of mixed stock analyses accuracy using known mixtures and baseline data from west coast North America samples.	1996
42	Allelic standardization for microsatellite loci in Pacific salmonids	USGS - ASC J. Nielsen	Alaska	all	Standardization of allelic signatures for salmonid microsatellite loci across different laboratory platforms, amplification equipment, and labs.	ongoing
43	Genetic stock identification of Pacific Rim sockeye salmon (2001 NPAFC Doc. 562)	ADFG - CF/CGL C. Habicht	Pacific Rim	sockeye	Integration of allozyme data for sockeye salmon from existing Pacific Rim baseline collections for use in mixed stock analysis.	2001
Also see study numbers 1-33						

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks						
44	Spawning habitat studies (ADFG Regional Information Reports 4K90-21)	ADFG – CF	Kodiak Island	pink	Quantification of spawning habitat available to pink salmon.	1990
45	Rearing habitat lake and limnology studies (ADFG Regional Information Reports 4K96-56, 4K98-44, 4K99-44, 4K00-40)	ADFG – CF	Kodiak Island	sockeye	Examination of freshwater rearing habitat and conditions available for juvenile sockeye salmon.	1990
46	Salmon enhancement, rehabilitation, evaluation, and monitoring efforts conducted in the Kodiak Management Area (ADFG Regional Information Reports 4K00-57, 4K01-65, and 4K03-41)	ADFG - CF	Kodiak area	sockeye, coho, chum, and pink	Documentation of all salmon enhancement and rehabilitation projects in the Kodiak area, including monitoring and evaluation efforts.	through 2003
47	Little Waterfall Creek barrier bypass habitat improvement and enhancement. (ADFG Regional Information Report 4K99-57, 4K05-5)	ADFG - CF S.G. Honnold	Little Waterfall Creek, Afognak Island near Kodiak NWR	coho and pink	Documentation of a barrier bypass project to make addition spawning and rearing habitat available to salmon.	1999-2005
48	Straying of two enhanced sockeye salmon stocks on northern Afognak Island (ADFG Regional Information Report 4K00-53, 4K02-56)	ADFG - CF J.A. Wadle	Afognak Island	sockeye	Assessment of straying of enhanced stocks and influence of artificial barriers in freshwater systems.	2000, 2002

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
49	Results of sockeye salmon stocking in Hidden Lake (ADFG Regional Information Report 4K95-37, 4K96-56, 4K98-44, 4K99-44, 4K00-40, 4K01-18, 4K01-32, 4K02-36, 4K03-31)	ADFG - CF S.G. Honnold	Hidden Lake, Afognak Island, Kodiak NWR	sockeye	Documentation of effects of stocking juvenile sockeye salmon on juvenile and adult production, commercial harvest, and the ecosystem.	1987-2003
50	An aquatic Rubic's cube: restoration of the Karluk Lake sockeye salmon (Canadian Special Publication of Fisheries and Aquatic Sciences 96: 419–434)	ADFG - CF J.P. Koenings	Karluk Lake, Kodiak NWR	sockeye	Analysis of available information on Karluk Lake sockeye salmon production to guide rehabilitation efforts.	1987
51	Establishment and monitoring of salmon runs into Frazer Lake (ADFG Regional Information Reports 4K89-21, 4K91-17, 4K93-32, 4K99-59, and 4K03-48; Canadian Journal of Fisheries and Aquatic Sciences 44: 66-76 and 45: 856-867; Journal of Fisheries Research Board of Canada 36:1265-1277).	ADFG - CF N.H. Sagalkin	Frazer Lake, Kodiak NWR	sockeye and Chinook	Evaluation of Frazer fish pass on smolt and adult passage and production; repair of lower diversion weir; and description of trophic level responses to introduced salmon runs.	1979, 1987, 1988, 1997-1998 and 2003

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
52	Effects of sockeye salmon stocking into Spiridon Lake on the Kodiak Wildlife Refuge (ADFG Regional Information Report 4K94-44, 4K95-37, 4K96-56, 4K97-47, 4K98-44, 4K99-44, 4K00-40, 4K01-18, and 4K02-36, 4K03-31, 4K04-22, 4K05-5)	ADFG - CF S.G. Honnold	Spiridon Lake, Kodiak NWR	sockeye	Documentation of effects of stocking juvenile sockeye salmon on smolt and adult production, commercial harvest, and the ecosystem.	1987-2005
53	Akalura Lake sockeye salmon restoration (ADFG Regional Information Report 4K99-64)	ADFG - CF L.G.J. Coggins	Akalura Lake, Kodiak NWR	sockeye	Documentation of restoration efforts for Akalura Lake sockeye salmon.	1999
54	Kitoi Bay salmon hatchery evaluation (ADFG Regional Information Report 4K95-39, 4K95-37, 4K96-14, 4K96-56, 4K97-36, 4K98-20, 4K98-44, 4K99-43, 4K99-44, 4K00-40, 4K00-43, 4K01-18, 4K01-42, 4K02-36, 4K02-41, 4K03-39, 4K04-29)	ADFG - CF S.G. Honnold	Kitoi Bay, Afognak Island	sockeye	Evaluation of hatchery, operated by Kodiak Regional Aquaculture Association, that produces sockeye salmon juveniles that are released into Little Kitoi Lake and Bay for brood stock harvest; coho salmon that are released into Crescent, Jennifer, Ruth, and Katmai lakes, as well as Katmai and Little Kitoi bays; and pink and chum salmon fry that are released into Big Kitoi Bay.	1996, 1998

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
55	Pillar Creek salmon hatchery evaluation (ADFG Regional Information Report 4K95-27, 4K96-15, 4K97-31, 4K98-24, 4K99-45, 4K00-39, 4K01-43, 4K02-38, 4K03-38, 4K04-40)	ADFG - CF S.G. Honnold	Pillar Creek, Kodiak Island	sockeye	Evaluation of hatchery, operated by Kodiak Regional Aquaculture Association, that produces sockeye salmon juveniles that are released into Spiridon, Hidden, Crescent, Little Waterfall, Little Kitoi, Jennifer, Ruth, and Sorg Lakes to create and maintain new runs; sockeye salmon juveniles that are released into Malina and Laura Lakes as part of efforts to rehabilitate depressed native runs; and coho salmon juveniles that are released into lakes along the Kodiak Road system.	1996, 1998
56	Malina Lake salmon rehabilitation and enhancement (ADFG Regional Information Report 4K04-22, 4K05-5)	ADFG - CF	Malina Lake, Afognak Island, Alaska Maritime NWR	sockeye	Documentation of restoration efforts (juvenile stocking and lake fertilization) for Malina Lake sockeye salmon.	2004-2005

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
57	Perenosa Bay salmon rehabilitation and enhancement (ADFG Regional Information Report 4K98-44, 4K99-44, 4K95-37, 4K96-56, 4K00-40, 4K01-18, 4K02-36, 4K03-31, 4K04-22)	ADFG - CF	Perenosa Bay, Afognak Island	sockeye, coho, and pink	Installation and evaluation of water diversion structures and fish passes in Pauls Lake system (Laura and Gretchen) and Portage Creek.	1998-2004
58	Terror Lake hydroelectric project studies 1990 (ADFG Regional Information Reports 4K88-27, 4K89-29, 4K90-12, 4K90-32 and 4K91-16)	ADFG - CF D. Gretsch	Terror Lake, Kodiak NWR	sockeye	Documentation of sockeye salmon egg and fry survival, spawning escapement, and spawner distribution.	1987-1989, 1990-1991
59	Impacts of climatic change and fishing on Pacific salmon abundance over the past 300 years (Science 290: 795-799)	UAF - IMS B. Finney	Kodiak Island (Karluk, Frazer, Red, Akalura lakes, Kodiak NWR), and Bristol Bay	sockeye	Collection and analysis of lake sediment cores to assess changes in salmon abundance and primary productivity, to examine relationships between salmon abundance, climate, productivity, and commercial harvest, and relationship between carcass nutrients and production.	2000

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
60	Limnological and fishery assessment of Kodiak area lakes (ADFG Regional Information Report 4K95-37, 4K99-44, 4K00-40, 4K01-18, 4K02-36, 4K03-31, 4K04-22, and 4K05-5)	ADFG - CF S.G. Honnold	Kodiak Island	sockeye	Assessment of lakes to evaluate potential for sockeye salmon production.	1995, 2001
61	Limnological and fishery assessment of 23 Alaska Peninsula and Aleutian area lakes (ADFG Regional Information Report 4K96-52)	ADFG - CF S.G. Honnold	Alaska Peninsula and Aleutian Islands	sockeye and coho	Assessment of lakes to evaluate potential for sockeye and coho salmon production.	1993-1995
62	Assessment and monitoring of anadromous fish at Summer Bay Lake, Unalaska Island, after the M/V Kuroshima oil spill (ADFG Regional Information Reports 4K98-44, 4K99-62 and 4K00-63, 4K01-33)	ADFG - CF J.N. McCullough	Summer Bay Lake, Unalaska Island, Alaska Maritime NWR	all	Monitoring of juvenile and adult salmon production following 1997 M/V Kuroshima oil spill.	1998-1999
63	Effects of minimum gillnet mesh size regulations on escapement (ADFG Regional Information Reports 4K97-55, 4K00-71)	ADFG - CF K.A. Bouwens	Bear River, North Alaska Peninsula (no federal nexus)	sockeye	Effects of gillnet mesh size on spawning escapements.	2000
64	Stocking sockeye salmon in barren lakes: effects on the macrozooplankton community (Fisheries Research 28: 29-44)	ADFG – CF G.B. Kyle	Alaska	sockeye	Effects on zooplankton after sockeye salmon stocked into previously barren lakes.	1996
65	Nutrient treatment of three coastal Alaskan lakes (Alaska Fishery Research Bulletin 1(2):153-167)	ADFG – CF G.B. Kyle	Alaska	sockeye	Assessment of sockeye salmon production and trophic level responses in fertilized lakes.	1994

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
66	Juvenile sockeye salmon survival in relation to biotic and abiotic freshwater factors (Canadian Special Publication of Fisheries and Aquatic Sciences 96: 216–234; Transactions of the American Fisheries Society 130:644-662)	ADFG – CF J.A. Edmundson	Alaska	sockeye	Analysis of information linking juvenile sockeye salmon growth and survival to habitat temperature regimes, euphotic volume, fry density, and forage base.	1987 and 2001
67	Smolt-to-adult survival patterns of sockeye salmon (Canadian Journal of Fisheries and Aquatic Sciences 50:600-611)	ADFG - CF J.P. Koenings	Alaska	sockeye	Analysis of information on smolt-to-adult survival based on smolt size and geographic latitude when entering sea.	1993
68	Monitoring Kodiak management area for oil spill contaminants and estimating effects on fisheries (ADFG Regional Information Report 4K89-21, 4K89-25, 4K90-26, 4K90-35)	ADFG - CF B.M. Barrett	Kodiak area	all	Survey of salmon management areas for contamination from Exxon Valdez oil spill.	1990
69	Fisheries productivity in the northeastern Pacific over the past 2,200 years (Nature 416 :729-733)	UAF B. P. Finney	Includes Karluk, Frazer, and Akalura systems	all	Description of historical salmon productivity.	2002

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks (continued)						
70	A Pacific interdecadal climate oscillation with impacts on salmon production (1997 article in Bulletin of the American Meteorological Society)	UW - JISAO N. Mantua	Pacific Coast of North America	all	Analysis of climate records and selected commercial salmon landings to determine whether relationships exist.	1997
Also see study numbers 27-33						
1B2 Describe relationship between escapement and production including smolt production						
71	Triennial salmon escapement goal review (ADFG Regional Information Report 4K01-66; 4K04-Draft for Alaska Peninsula and Aleutian Islands; ADFG Fishery Manuscript Report 05-05)	ADFG - CF P.A. Nelson	Kodiak-Aleutians (goals for 29 sockeye, 5 Chinook, 23 coho systems; 15 pink, 14 chum sections or districts)	all	Evaluation, modification, and setting of spawning escapement goals. An ADFG regulatory requirement conducted for each area on three-year Alaska Board of Fisheries' cycle.	ongoing
72	Stock assessment of Afognak Lake sockeye salmon (ADFG Regional Information Report 4K03-31, 4K04-22, 4K05-5; Alaska Fisheries Research Bulletin 5:88-102; FIS 03-407 and 04-412)	ADFG - CF S. Schrof	Afognak Lake, Alaska Maritime NWR	sockeye	Estimation of smolt abundance based on mark-recapture experiments; collection of smolt age and size information; description of lake rearing conditions and spawning habitat availability	ongoing

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B2	**Describe relationship between escapement and production including smolt production (continued)**					
73	Use of preemergent fry sampling data for predicting Kodiak pink salmon returns (ADFG Regional Information Report 4K90-3 and 4K01-4)	ADFG – CF I.W. Vining	Kodiak	pink	Prediction of annual pink salmon runs to Kodiak Island based on fry sampling data.	1963-20001
74	Influence of carcass-derived nutrients on sockeye productivity of Karluk Lake: Importance in the assessment of an escapement goal (1998 article in North American Journal of Fisheries Management)	ADFG - CF D.C. Schmidt	Karluk Lake, Kodiak NWR	sockeye	Development of spawner-recruit models and examination of importance of marine-derived nutrients from salmon carcasses based on synthesis of escapement, limnology, and sediment core data.	1998
75	Sockeye salmon escapement goal evaluation for Saltery Lake (ADFG Regional Information Report 4K01-37)	ADFG - CF S.G. Honnold	Saltery Lake, Kodiak Island (no federal nexus)	sockeye	Review of limnology and fishery data to evaluate escapement goal.	2001
76	Sockeye salmon smolt investigations at Red, Akalura, and Upper Station lakes (ADF& Regional Information Reports 4K90-21, 4K91-17, 4K92-25, 4K93-1, 4K93-23, 4K93-32, 4K94-26, 4K95-26, 4K95-37, 4K96-16, 4K96-56, and 4K97-50; 4K05-10)	ADFG - CF L.G. Coggins	Red, Akalura, and Upper Station lakes, Kodiak NWR	sockeye	Estimation of sockeye salmon smolt abundance, timing, and growth characteristics.	1990-1997
77	Karluk Lake sockeye salmon smolt studies (ADFG Regional Information Report 4K99-44, 4K00-40, 4K01-18, 4K02-36, 4K03-31, 4K04-22, 4K05-5)	ADFG - CF S. Duesterloh	Karluk Lake, Kodiak NWR	sockeye	Estimation of sockeye salmon smolt abundance, timing, and growth characteristics.	2005

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B2	**Describe relationship between escapement and production including smolt production (continued)**					
78	Malina Lake sockeye salmon smolt studies (ADFG Regional Information Report 4K95-37, 4K96-56, 4K98-44, 4K99-44, 4K00-40, 4K01-18, 4K02-36, 4K03-31)	ADFG - CF S.G. Honnold	Malina Lake, Afognak Island, Alaska Maritime NWR	sockeye	Estimation of sockeye salmon smolt abundance, timing, and growth characteristics.	1998
79	Bear Lake sockeye salmon smolt studies (ADFG Regional Information Report 4K01-34, 4K02-30, 4K03-21,)	ADFG – CF K.A. Bouwens	Bear Lake, North Alaska Peninsula (no federal nexus)	sockeye	Estimation of sockeye salmon smolt abundance, timing, and growth characteristics.	1998-1999
80	Evaluation of sockeye salmon smolt population estimate bias from single-site mark recapture experiments (ADFG Regional Information Report 4K03-40)	ADFG - CF N.H. Sagalkin	Alaska	sockeye	Smolt abundance estimation bias from mark-recapture experiments.	2003
81	Run forecasts and harvest projections and review of the season (see ADFG Special Publication 05-01 for methods)	ADFG – CF D. Eggers	Alaska	all	Prediction of annual runs and available harvests based on past escapements and other available production data.	ongoing
82	Evaluation of the use of nitrogen stable isotope ratios to establish escapement levels for Pacific salmon (2001 article in Fisheries; 1996 article in Canadian J. Fisheries and Aquatic Sciences)	Weyerhaeuser Co. R.E. Bilby	Washington	coho	Measurement of stable isotope signatures in juveniles and comparison with values in returning adults.	1996 and 2001
Also see study number 6						

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B3	**Determine quantity of salmon by river/lake system needed to sustain ecosystem functions**					
83	Influence of carcass-derived nutrients on sockeye salmon productivity of Karluk Lake (North American Journal of Fisheries Management 18: 743-763)	ADFG – CF D.C. Schmidt	Karluk Lake, Kodiak NWR	sockeye	Assessment of spawning escapement goal based on carcass-derived nutrients.	1998
84	Reconstruction of salmon-derived nutrients over the past 2,200 years in two Kodiak Island lakes (Alaska. Journal of Paleolimnology 30:35-53)	UAF B. P. Finney	Karluk and Frazer lakes, Kodiak NWR	sockeye	Description of historical diatom abundance and sockeye salmon population dynamics by examination of lake cores.	2003
85	Ecological effects of spawning salmon on several southcentral Alaskan streams (1995 Univ. Alaska Fairbanks Ph.D. thesis)	UAF R.J. Piorkowski	Southcentral Alaska	all	Examination of effects of salmon carcasses on macroinveterbrate community structure and relative amounts of marine-derived nitrogen.	1995
86	Roles of phosphorus and nitrogen in lake ecosystems (ADFG Regional Information Report 4K03-42)	ADFG – CF K. Spalinger	Alaska	all	Examination and description of role of phosphorus and nitrogen in lakes.	2003
87	Density-dependent effects on sockeye salmon juvenile survival (Theory and Application in Fish Feeding Ecology, University of South Carolina Press: 187-209; Fishery Research Bulletin 4(2):120-135)	ADFG – CF J.P. Koenings	Alaska	sockeye	Description of effects on juvenile sockeye salmon and the zooplankton community in lakes resulting from intense predation on zooplankton by sockeye salmon.	1992 and 1997

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B3	**Determine quantity of salmon by river/lake system needed to sustain ecosystem functions (continued)**					
88	Impacts of marine derived nutrients on stream ecosystem functioning (2003 article in Proceedings of the Royal Society of London)	Univ. British Columbia, Canada Y. Zhang	Mayfly Creek, BC, Canada	chum	Examination of effects of marine-derived nutrients from chum carcasses on detritus processing by stream invertebrates	2003
89	Pacific salmon and wildlife ecological contexts, relationships, and implications for management (2001 Special Edition Technical Report, Wash. Dept. Fish and Wildlife)	Wash. Dept. Fish and Wildlife D. Johnson	Washington and Oregon	all	Synthesis of information on salmon and wildlife species relationships within the broad context of the ecosystems they inhabit.	2001
90	Delivery of pollutants by spawning salmon (Nature 425: 255-256)	E.M. Krumme	Canada	sockeye	Documentation of delivery of a persistent industrial pollutant, polychlorinated biphenyls (PCBs), by spawning salmon to lakes; documentation of sevenfold increase in lake sediment PCB content in years with large runs.	2003
91	Pacific salmon, nutrients, and the dynamics of freshwater and riparian ecosystems (2002 article in Ecosystems)	UW - SFAS R.J. Naiman	Pacific northwest	all	Review and synthesis of information on role of Pacific salmon in aquatic ecosystems.	2002

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B3	**Determine quantity of salmon by river/lake system needed to sustain ecosystem functions (continued)**					
92	Pacific salmon in aquatic and terrestrial systems (Bioscience)	USFS S. Genden	Pacific northwest	all	Review and synthesis of information on role of Pacific salmon in aquatic and terrestrial ecosystems.	2002
93	Nutrients in salmonid ecosystems: Sustaining production and biodiversity (2003 book by American Fisheries Society)	Univ. British Columbia, Canada J. Stockner	Pacific northwest	all	Documentation of role and importance of marine-derived nutrients in salmonid ecosystems, and how this can be used to manage and rebuild stocks.	2001
Also see study numbers 49-52, 59, 61, 64, and 65						
1B4	**Relate historic salmon harvest to current productivity levels of river/lake systems**					
See study numbers 59, 63, 69-71, and 74						
2A1	**Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date**					
94	Subsistence Harvests by Kodiak Island Borough Communities (ADFG Technical Papers 193, 199, 200, 201, 202, 218, and 252)	ADFG – S J.A. Fall	Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions	all	Conducted household surveys to document subsistence harvests and uses, and effects of 1989 Exxon Valdez oil spill on harvests, uses, and stock status.	1986-1987, 1989-1998, 2004, and 2005

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A1	**Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date (continued)**					
95	Annual summary of commercial, subsistence and personal use fisheries for Alaska Peninsula and Aleutian Islands management areas (ADFG Regional Information Reports 4K94-23, 4K95-31, 4K97-1, 4K97-23, 4K99-5, 4K00-17, 4K02-22, 4K03-23, 4K04-34)	ADFG - CF Shaul, A.R.	Alaska Peninsula and Aleutian Islands	all	Documentation of annual salmon harvests, including subsistence harvests.	1993-1996, 1998, 1999, 2001-2003
96	Nelson Lagoon resource use (ADFG Technical Paper 182)	ADFG - S R.T. Stanek	Nelson Lagoon	all	Conducted household interviews to document subsistence harvest and use, and to map subsistence use areas.	1986-1987
97	Noncommercial harvest and uses of wild resources in Sand Point, Alaska (ADFG Technical Paper 226)	ADFG - S D.B. Andersen	Sand Point	all	Conducted household interviews to document harvest and use, and key informant interviews to collect information on local subsistence use.	1992
98	Noncommercial harvest and uses of wild resources in King Cove (ADFG Technical Paper 227)	ADFG - S R. Mason	King Cove	all	Conducted household surveys to document subsistence use patterns and economic information; and key respondent interviews to determine use areas.	1992-1993

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A1	**Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date (continued)**					
99	Harvest and use of fish, wildlife, and plant resources in False Pass (ADFG Technical Paper 183)	ADFG - S J.A. Fall	False Pass, Unimak Island	all	Conducted a household survey to document harvests, participation, the seasonal round of harvest activities, and harvest methods; mapped subsistence use areas, and obtained economic and historical information.	1988
100	Subsistence fisheries harvest assessment and traditional ecological knowledge (FIS 02-032)	ADFG - S B. Davis	Cold Bay, False Pass, King Cove, Nelson Lagoon, Sand Point, Adak, Akutan, Atka, Nikolski, and Unalaska	all	Conducted post-season interviews and used harvest calendars to estimate subsistence harvests of salmon and freshwater fishes, and to describe relationship between commercial and subsistence fishing, including estimates of fish from commercial catches taken for home use; conducted key respondent interviews and used data from tapes and archives to document fish ecology.	2002-2003

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A1	**Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date (continued)**					
101	Resource utilization in Atka (ADFG Technical Paper 88)	ADFG - S D.W. Veltre	Atka	all	Documentation of contemporary and historic resource uses, including harvest methods, and community distribution and use patterns.	1983
102	Preliminary baseline study of subsistence resource utilization in the Pribilof Islands (ADFG Technical Paper 57)	ADFG - S D.W. Veltre	Pribilof Islands (St. Paul and St. George)	all	Documentation of resources used for food, harvest methods, harvest quotas, and uses.	1981
103	Resource utilization in Unalaska (ADFG Technical Paper 58)	ADFG - S D.W. Veltre	Unalaska	all	Documentation of harvest, distribution, preparation, and consumption of subsistence food resources; discussed past resource use based on archaeological and ethnographic literature as well as current uses.	1982

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A1	**Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date (continued)**					
104	Subsistence fisheries harvest assessment and traditional knowledge (FIS 04-457)	ADFG - S L. Williams	Kodiak Area	all	Integration of subsistence salmon permit data and traditional knowledge; and improvement of user support for permit system.	2004-2006
2A2	**Improve reporting systems for Federal subsistence harvests**					
105	Implementation of Statewide Subsistence Fisheries Harvest Assessment Strategy (FIS 01-107)	ADFG - S J. Fall	Alaska	all	Review of study 00-017 recommendations, harvest assessment methods, and data use at regional workshops; determination of need for harvest assessment operational plans; production of 2001 and 2002 annual subsistence reports and entry of 2001 and 2002 data into Alaska Subsistence Fisheries Database.	2001-2003

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A2 Improve reporting systems for Federal subsistence harvests (continued)						
106	Statewide subsistence fisheries harvest monitoring strategy (FIS 00-017)	ADFG – S J. Fall	Alaska	all	Review and evaluation of subsistence fisheries and harvest assessment programs (including methods and reporting standards) by regional workshops; development of recommendations for a unified strategy to assess subsistence fisheries harvests (including training programs to implement cooperative programs); production of 1999 annual subsistence fisheries report; and entry of 1999 data into Alaska Subsistence Fisheries Database.	2000
See study numbers 104						
2A3 Independently verify harvest data						
See study numbers 104-106						
2B1 Identify environmental, demographic, regulatory, cultural, and socioeconomic factors affecting subsistence harvest levels						
107	Karluk River visitor use census (ADFG Fishery Data Series Report 03-17)	ADFG – SF L.D. Schwarz	Karluk River	all	Visitor use survey.	2002
Also see study numbers 94 and 100						

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2B2 Describe current and traditional methods and means by species and area						
See study numbers 99, 101, and 102						
2B3 Describe and document current and traditional uses and distribution practices						
See study numbers 94, 96-98, and 101-103						
2C1 Gather local perspectives on future use patterns						
No studies conducted						
2C2 Evaluate key factors influencing future use patterns						
No studies conducted						
2C3 Build process based models to predict future use patterns						
No studies conducted						
3A1 Examine effectiveness of current regulations for subsistence harvests						
No studies conducted						
3A2 Develop real-time information sharing among user groups and agencies						
Also see study numbers 105 and 106						
3A3 Examine alternative management strategies						
108	Subsistence as an economic system in Alaska: Theoretical and policy implications (ADFG Technical Paper 67)	ADFG - S D. Lonner	Alaska	all	Attempt to better define subsistence use in Alaska by drawing upon research findings in economic anthropology, and to describe implications for subsistence management.	1980

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3A3	**Examine alternative management strategies (continued)**					
109	Biocomplexity and fisheries sustainability (2003 article in Proceedings of the National Academy of Sciences)	UW - SAFS R. Hilborn	Bristol Bay	sockeye	Examination of role of biocomplexity in stabilizing and sustaining sockeye salmon using analyses of climate records, commercial salmon landings, recruit per spawner, and production from various types of spawning habitats; evaluation of ADFG's fixed escapement policy as a means to protect biocomplexity.	2003
110	Towards Sustainable Fisheries: Balancing Conservation and Use of Salmon and Steelhead in the Pacific Northwest (1999 book by Sustainable Fisheries Foundation)	USGS - ASC E. Knudsen	Pacific northwest	all	Documentation of conference proceedings on historical perspectives and ideas for developing a sustainable Pacific salmon fisheries management strategy in which society and government agencies establish a shared vision, common policies and collaborative management.	1996

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B1 Describe socioeconomic impacts of other fisheries						
See study number 100						
3B2 Describe total harvest rates by fishery for specific stocks of interest						
111	ADFG commercial fish ticket receipt program	ADFG - CF C. DiCostanzo	Alaska	all	Compilation of annual commercial harvest records for all salmon fisheries from delivery receipts.	ongoing
112	A history of the salmon fishery of Kodiak Island (Alaska Historical Committees Studies in History No. 216. 355pp)	P. Roppel	Kodiak Island	all	Documentation of Kodiak Island salmon fishery from a historical perspective.	1986
113	An estimate of Spiridon Lake sockeye salmon commercially harvested within the Southwest Afognak section and Northwest Kodiak district, (ADFG Regional Information Reports4K94-43, 4K96-32, 4K97-44, and 4K99-25)	ADFG - CF P.A. Nelson	Southwest Afognak Section and Northwest Kodiak District	sockeye	Estimation of Spiridon Lake sockeye salmon harvested within Southwest Afognak Section and Northwest Kodiak District commercial fisheries. (Spiridon Lake run is wholly maintained by stocking, it had no wild sockeye salmon run)	1994-1997
114	Level of non-local sockeye salmon commercial harvest within Kodiak archipelago based on average weight (ADFG Regional Information Reports 4K94-5, 4K95-11, 4K96-28, and 4K96-41)	ADFG – CF I.W. Vining	Kodiak area	sockeye	Estimation of catch of non-local salmon stocks based on average weights.	1983-1995

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B2	**Describe total harvest rates by fishery for specific stocks of interest (continued)**					
115	Accuracy of sockeye salmon average weights from Kodiak commercial fish ticket receipts. (ADFG Regional Information Report 4K94-4)	ADFG - CF B.M. Barrett	Kodiak	sockeye	Examination of accuracy of sockeye salmon weights reported on fish ticket receipts.	1994
116	Estimated incidence of Upper Station late run sockeye salmon in Alitak Bay District, Inner Akalura section commercial (ADFG Regional Information Report 4K92-34)	ADFG -CF P.A. Roche	Alitak Bay District	sockeye	Estimation of Upper Station run in Alitak Bay District commercial catches.	1992
117	Contribution of Karluk and Upper Station late run sockeye salmon to the Sitkalidak, Katmai, and Alinchak sections July fisheries (ADFG Regional Information Report 4K94-3)	ADFG - CF C.O. Swanton	Sitkalidak, Katmai, and Alinchak sections	sockeye	Estimation of catch of Karluk and Upper Station stocks in Sitkalidak, Katmai, and Alinchak sections.	1992-1993
118	Overview of the North Peninsula sockeye salmon fishery with emphasis on 1992 season. (ADFG Regional Information Report 4K92-36)	ADFG - CF B.M. Barrett	North Peninsula (Nelson Lagoon to Strogonof Point)	sockeye	Documentation of harvest, effort, and fishing patterns during North Peninsula commercial sockeye salmon fishery.	1992
119	Stock composition of sockeye salmon harvests in northern Alaska Peninsula commercial harvests (ADFG Regional Information Report 5J89-11)	ADFG - CF H.J. Geiger	Northern Alaska Peninsula	sockeye	Estimation of northern Alaska Peninsula commercial harvest stock composition using scale growth and age differences.	1989-1990

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B2	**Describe total harvest rates by fishery for specific stocks of interest (continued)**					
120	Stock composition of sockeye salmon harvests in southern Alaska Peninsula (Area M) commercial harvests during June (ADFG Regional Information Reports 5J88-03, 5J89-06, 5J97-17, 5J95-05, and 5J00-05; ADFG Fishery Research Bulletin 91-01)	ADFG - CF D.M. Eggers	South Alaska Peninsula	sockeye	Estimation of stock composition of commercial sockeye salmon harvests in Area M of the southern Alaska Peninsula using scale growth differences, tags, and genetic stock identification techniques.	1987-2000
121	Interceptions of coho salmon in commercial fisheries south of Unimak Island, in the Shumagin Islands, and areas outside Chignik (ADFG Regional Information Report 5J89-12, 5J91-14, 5J91-15, and 5J95-09)	ADFG - CF D.M. Eggers	South Alaska Peninsula	coho	Examination of estimating stock composition of commercial coho salmon harvests along the southern Alaska Peninsula using run timing and scale growth differences.	1989-1995
122	Shumagin Island section July-September sockeye harvest (ADFG Regional Information Reports 4K88-12, 4K90-1, 4K95-7, and 4K95-51)	ADFG - CF J.N. McCullough	Shumagin Islands	sockeye	Documentation of harvest and effort during Shumagin Island commercial sockeye salmon fishery.	1988, 1989, 1994-1996
123	Analysis of South Unimak and Shumagin Islands June fisheries sockeye salmon guideline harvest level time periods (ADFG Regional Information Report 4K94-45)	ADFG - CF J.N. McCullough	Unimak and Shumagin Islands	sockeye	Evaluation of Area M June fishery guideline harvest time periods.	1994

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B2	**Describe total harvest rates by fishery for specific stocks of interest (continued)**					
124	June port sampling observations as indicators of ratio of sockeye to chum salmon harvested in commercial fisheries in South Unimak and Shumagin Islands (ADFG Fishery Manuscripts 05-02 and 05-03)	ADFG - CF I.W. Vining	Unimak and Shumagin Islands	sockeye and chum	Evaluation of sockeye to chum salmon ratios based on port sampling.	2004
125	South Unimak and Shumagin Islands commercial salmon fishing gear study (ADFG Regional Information Report 4K95-40)	ADFG - CF P.B. Holmes	Unimak and Shumagin islands	sockeye	Examination of commercial fishing gear catches.	1984
126	Aleutian Islands management area salmon fisheries and stock status (ADFG Regional Information Reports 4K95-7 and 4K95-51)	ADFG - CF J.N. McCullough	Aleutian Islands	sockeye	Documentation of harvest, effort, and stock status of Aleutian islands commercial sockeye salmon fishery.	1994-1996
127	Atka/Amlia Islands management area pink salmon fishery (ADFG Regional Information Report 4K95-9)	ADFG - CF P.B. Holmes	Atka and Amlia islands	pink	Description of pink salmon commercial fishery.	1992-1994
128	Incidence and contribution of coded-wire-tagged Chinook salmon to Kodiak management area commercial catches (ADFG Regional Information Report 4K97-7)	ADFG - CF C.O. Swanton	Kodiak	Chinook	Estimation of coded-wire-tagged Chinook salmon stock contributions to Kodiak area commercial harvests.	1997

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B2	**Describe total harvest rates by fishery for specific stocks of interest (continued)**					
129	Chinook salmon bycatch in groundfish fisheries of the Bering Sea/Aleutian Islands and Gulf of Alaska (ADFG Regional Information Report 5J91-02, 5J91-07, 5J91-08, 5J94-16, and 5J91-10, Alaska Fishery Research Bulletin 9(1) 2000)	ADFG - CF D. Ackley	Bering Sea - Aleutians and Gulf of Alaska	Chinook	Estimation of trawl fishery Chinook salmon bycatch by continent of origin using NMFS groundfish fishery observer program data.	1990-2000
130	Interceptions of coho salmon in Japanese land based driftnet fishery (Univ. Washington reports to North Pacific Fisheries Commission)	UW - FRI R. Walker	North Pacific	coho	Examination of scale growth differences as a method to determine continent of origin of Japanese high seas and land based commercial coho salmon harvests.	1981-1991
131	Statewide Harvest Survey of sport fishing catch and effort	ADFG - SF/RTS D. Bernard	Alaska	all	Estimation of annual sport catches and harvests from responses to a mailed survey.	ongoing
132	Statewide logbook program for guided freshwater sport fishing catch and effort	ADFG – SF/RTS D. Bernard	Alaska	all	Compilation of annual guided sport fishing harvest records for all salmon fisheries from a mandatory logbook program for guides.	ongoing since 2005

Appendix F. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B2	**Describe total harvest rates by fishery for specific stocks of interest (continued)**					
133	Recreational fisheries of the Kodiak and Alaska Peninsula/Aleutian Islands regulatory areas (ADFG Fishery Management Reports 94-5, 95-3, 96-3, 97-2, 00-1, and 02-02; Federal Aid in Fish Restoration, Annual Performance Report Project F-9-17(26)G-I-B)	ADFG - SF L. J. Schwarz	Kodiak and Alaska Peninsula/Aleutian Islands	all	Description of sport fisheries, including effort, catch, and harvest.	1984, 1985, 1993, 1994, 1996-2000
134	Sport effort and harvest of coho salmon in selected Kodiak Management Area streams (ADFG Fishery Data Series Reports 3, 71, and 00-9; ADFG Federal Aid in Fish Restoration, Annual Performance Reports, Projects F-9-18(27)S-41-1 and F-10-1(27)S-41-1)	ADFG – S R.N. Begich	Afognak and Unalaska islands	coho	Estimation of annual sport catches and harvests from creel censuses.	1995-1998
135	Ayakulik River Chinook salmon creel survey, Kodiak National Wildlife Refuge (USFWS Alaska Fisheries Technical Report 37)	USFWS - KFWFO J.A. Booth	Ayakulik River	Chinook	Estimation of catch, harvest, and effort from creel surveys.	1993 and 1994
Also see study numbers 1-4, 22, 71, 74, and 94-104						
Information Databases						
Fisheries Resource Monitoring Program database		OSM - FIS V. McClain	Alaska	all	Maintenance of reports and other products resulting from FRMP studies. Copies of reports can be downloaded from a website.	ongoing since 2000

Appendix F. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
Alaska Subsistence Harvest Database and reporting	ADFG - S R. Walker	Alaska	all	Maintenance of searchable database of subsistence fisheries harvest information and publication of annual reports. Database can be accessed from a website and is available on CD.	ongoing since 1980
Alaska Subsistence Harvest Database update and report preparation (FIS 04-751)	ADFG - S R. Walker	Alaska	all	Entry of 2003-2005 and pre-1988 salmon data, along with 2003-2005 and pre-2003 non-salmon fish and marine invertebrate data, into Alaska Subsistence Fisheries Database.	2004-2006
Alaska Subsistence Harvest Database GIS integration (FIS 02-043)	ADFG - S B. Davis	Alaska	all	Integration of Alaska Subsistence Fisheries Database records with a system of maps depicting communities and harvest locations. Database is available on CD.	2002-2003

Appendix F. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
Project information and access system (FIS 01-154)	ADFG - SF S. Darr	Alaska	all	Development of prototype for a web-based searchable information system for studies, project manager contacts, and publications.	2001-2002
Regional Subsistence Bibliography: Volume IV, Southcentral Alaska (ADFG Technical Report 97)	ADFG – S J.H. Overturf	Southcentral, including Kodiak Island	all	A bibliography with abstracts and keywords for 456 references on a wide range of topics concerning subsistence uses of fish and wildlife.	1900-1984
ADFS publications database	ADFG - S, SF, CF K. Savikko	Alaska	all	Maintenance of reports and other products resulting from work conducted by ADFG staff. Copies of reports can be downloaded from a website.	ongoing

Appendix F. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
ADFG statewide data warehouse of salmon size, age and growth records	ADFG - CF/MTAL B. Alger	Alaska	all	Inventory of salmon age, size, and growth records, and establishment of steering committee, composed of state, federal and research interests, to develop protocols and strategic approaches.	2003-2004
Historical salmon scale collections and electronic database	UW - SAFS K. Myers	North Pacific and Bering Sea	all	Maintenance of salmon scales, acetate scale impressions, and associated biological and scale measurement data; and coordination of information requests to U.S. government for NPAFC-related scale sample and data	ongoing since 1955
University of Washington, School of Aquatic and Fisheries Science publications database	UW - SAFS C. Boatright	Pacific Coast of North America	all	Maintenance of reports and other products resulting from work conducted by UW-SFAS staff.	ongoing since 1973

Appendix F. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
Exxon Valdez Trustees Council publications database	Exxon Valdez Oil Spill Trustees Council	Areas affected by 1989 oil spill, including Kodiak area	all	Maintenance of reports and other products resulting from Exxon Valdez oil spill damage assessment and restoration work. Copies of reports can be downloaded from a website.	ongoing since 1989
North Pacific Anadromous Fish Commission high seas tagging database	UW - SAFS K. Myers	North Pacific and Bering Sea	all	Maintenance of high seas salmon tag release and recovery database (including coded-wire tag database) using data obtained from NPAFC; and reporting of tag recoveries to NPAFC.	ongoing since 1956 (coded-wire tag since 1980)

Appendix F. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
North Pacific Ecosystem Metadatabase and Reporting	North Pacific Marine Science Organization (PICES) NOAA B. Megrey	North Pacific	all	Development of indexed, annotated metadatabase cataloging data, reports, databases, proposals, and other media concerning ecosystems of the North Pacific Ocean; periodic reporting of status and trends of North Pacific marine ecosystems including consideration of factors causing, or expected to cause, changes in near-future.	ongoing since 2002

Appendix G. Knowledge gap analysis results for Kodiak-Aleutians salmon subsistence fisheries unit, 2006.

GOAL 1: OBTAIN BIOLOGICAL INFORMATION TO PROVIDE FOR SUBSISTENCE USES

OBJECTIVE 1A: Describe abundance, composition, and timing of salmon populations

Information Need 1A1: Estimate abundance of total run by species and river/lake system

Knowledge is adequate for Chinook, chum, pink, and large sockeye salmon runs, but is incomplete for coho, and small sockeye salmon runs.

- For the Kodiak management are, total run estimates and associated age, sex, and length (ASL) data for all salmon species are available most years from 10 area river/lake systems: Karluk, Ayakulik, Dog Salmon, Frazer Lake, Upper Station, Litnik (Afognak Lake), Buskin, Laura Lake (Pauls Bay), Malina Lake, and Saltery Lake. Additional estimates are available for groups of smaller systems based on aggregated harvests along with aerial and ground survey information.
- For the Alaska Peninsula management area, total run and associated ASL data for all salmon species are available each year from six river/lake systems: Nelson (Sapsuck) River, Bear River, Ilnik River, Orzinksi River, Sand River, and Mortensens Creek. Additional estimates are available for groups of smaller systems based on aggregated harvests along with aerial and ground survey information.
- For the Aleutian Islands management area, total run and associated ASL data are not available for any salmon species from individual river/lake systems with the exception of sockeye salmon returning to McLees Lake. Some estimates are available for groups of systems based on aggregated harvests and aerial survey information.

Consider proposals to improve total run estimates for coho and small sockeye salmon runs. This Information could be collected in conjunction with proposals to address information needs 1A2 (Obtain reliable estimates of spawning escapement over time) and 3B2 (Describe harvest rates by fishery for specific stocks of interest).

- Estimates of total runs require information on harvests and escapements. Therefore, this information need is closely tied with information needs 1A2 (Obtain reliable estimates of spawning escapement over time), 2A1 (Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date), and 3B2 (Describe harvest rates by fishery for specific stocks of interest).
- For the Kodiak area, information on total run estimates is generally adequate, but could be improved by obtaining more reliable escapement estimates (information need 1A2) for coho salmon in most systems, as well as for sockeye salmon in small systems such as Akalura, Silver Salmon, and Horse Marine within Olga Bay.
- For the Alaska Peninsula area, total run information generally appears to be adequate.
- For the Aleutian Islands area, total run estimates are generally lacking for lake/river systems and species with the exception of McLees Lake sockeye salmon. However, total run estimates by species and river/lake system are usually not needed to guide management because harvest pressures on most stocks are not great. There is usually little or no

Information Need 1A1: continued

commercial fishing, sport fishing harvests are generally low, and rural communities are small.

Information Need 1A2: Obtain reliable estimates of spawning escapement over time

Knowledge adequate for Chinook, chum, pink, and large sockeye runs, salmon, but is incomplete for coho and small sockeye runs salmon.

- For the Kodiak management area, reliable escapement estimates and associated ASL data for all salmon species are available most years from weir projects operated on river/lake systems: Karluk, Ayakulik, Dog Salmon, Frazer Lake, Upper Station, Litnik (Afognak Lake), Buskin, Laura Lake (Pauls Bay), Malina Lake, and Saltery Lake Aerial surveys are used to estimate numbers of salmon entering some of these systems after weirs have been removed as well as to obtain escapements in systems without weir projects. A limited number of ground surveys are also conducted each year. Overall, escapement estimates of coho and late run chum salmon are considered to be the least reliable since these species continue to enter systems after weirs are removed, and at a time of the year when weather and water conditions often make it difficult to conduct aerial and ground surveys.
- For the Alaska Peninsula management area, reliable escapement estimates and associated ASL data for all salmon species are available most years from weir projects operated on six river/lake systems: Nelson (Sapsuck) River, Bear River, Ilnik River, Orzinksi River, Sand River, and Mortensens Creek. Aerial surveys are used to estimate the number of salmon entering these systems after weirs have been removed, as well as to obtain minimum escapements in systems without weir projects, including Meshik River, Mud Creek, Cinder River, Christianson Lagoon, Johnson Lagoon, and Joshua Green River. As was stated for the Kodiak area, escapement estimates of coho and late run chum salmon are considered to be the least reliable.
- For the Aleutian Islands management area, reliable escapement estimates and associated ASL data for sockeye salmon have only recently been available each year from a weir project operated on one lake/river system: McLees Lake. No other reliable escapement estimates and associated ASL data are currently available each year for any other Aleutian Islands management area river/lake systems. Minimum counts are obtained from aerial surveys of some systems, but it is extremely difficult to conduct surveys due to frequent storms and the remote nature of this area.

Consider proposals to improve escapement estimates for coho and small sockeye salmon runs.

- For the Kodiak area, information is needed to develop reliable annual escapement monitoring programs for coho salmon in most systems and sockeye salmon mainly in small systems such as Akalura, Silver Salmon, and Horse Marine within Olga Bay. After 2009, funding may be needed to continue to operate weirs on the Buskin River.
- For the Alaska Peninsula area, escapement information is adequate to guide management.
- For the Aleutian Islands area, except for McLees Lake sockeye salmon, reliable escapement estimates are lacking for all salmon species. However, reliable escapement estimates for runs are usually not needed to guide management because harvest pressures on most stocks

Information Need 1A2: continued

are not great. There is usually little or no commercial fishing, sport fishing harvests are generally low, and rural communities are small.

Information Need 1A3: Determine adult run timing and migration patterns by stock, size, and age

Knowledge is adequate for most stock of all five salmon species, although size and sex information may be lacking for some stocks.

- For the Kodiak and Alaska Peninsula management areas, adult salmon timing and migration patterns within inshore waters, along with associated size and age information, are reasonably well described for stocks returning to most major river/lake systems as these stocks travel through commercial fishing districts (harvest monitoring and tagging studies) and either enter systems to spawn (weirs and aerial surveys) or arrive on the spawning grounds (aerial surveys). Similar information is also available for stock grouping of smaller river/lake systems.
- For the Aleutian Islands management area, adult salmon timing and migrations patterns within inshore waters are generally described from harvest monitoring, aerial and ground surveys. Stock specific size and age information is generally lacking, although detailed information for sockeye salmon entering McLees Lake to spawn is available from a weir project.
- Stock specific information on migration patterns is generally not available for offshore marine waters, although tagging and genetics studies that seek to provide such information are being conducted by NOAA and various universities, usually in conjunction with international programs and commissions.

Do not consider proposals.

- For the Kodiak and Alaska Peninsula areas, inshore timing and migration information is adequate, and no additional studies are needed.
- For the Aleutian Islands, inshore timing and migration information is incomplete for most stocks. However, improved inshore timing and migration information is usually not needed to guide management in this area because harvest pressures on most stocks are not great. There is usually little or no commercial fishing, sport fishing harvests are generally low, and rural communities are small.

Information Need 1A4: Define and catalog management units for subsistence fisheries

Knowledge is adequate for all salmon species and river/lake systems.

- The existing catch and escapement data collection program, supplemented by stock identification results, has adequately defined management units for all important salmon runs that sustain subsistence fisheries.

Do not consider proposals.

- Information is adequate and no additional work is needed at this time to better define and catalog subsistence fishery management units.

OBJECTIVE 1B: Determine salmon production needed to support fisheries

Information Need 1B1: Identify critical factors that affect population dynamics, including effects of restoration and enhancement on wild stocks

Knowledge is adequate for sockeye salmon, but is incomplete for other salmon species.

- Information in adequate on critical freshwater factors for important sockeye salmon stocks in the Kodiak, Alaska Peninsula, and Aleutian Islands management areas, but is incomplete or lacking for stocks of other salmon species in these areas. However, there is information on critical factors available from studies in other locations in Alaska and elsewhere that would be applicable to stocks in these management areas.
- Climate variability appears to be one of the most important factors affecting salmon population dynamics, and seems to have its greatest effect on juvenile salmon in estuarine and near shore marine waters.
- Marine studies of critical factors have produced broad-based rather than population-specific information since it is difficult to identify individual stocks in mixed aggregations; while freshwater studies have focused on populations in specific drainages or portions of drainages. More studies have been conducted on sockeye than on either Chinook or coho salmon.

Consider proposals for coho salmon.

- A great deal of information on critical factors affecting sockeye salmon during freshwater residence is available for sockeye salmon stocks, and there does not appear to be a compelling need to conduct additional work at this time.
- Information on critical freshwater factors is incomplete or lacking for other salmon species, but this information would probably be most useful for coho rather than Chinook, chum, or pink salmon.
- NOAA is the most appropriate agency to coordinate and fund marine salmon studies, since it has primary management authority for salmon in marine waters. While the Monitoring Program could support these efforts by funding studies that expand and improve genetic baseline data collections that improve the resolution of mixed stock identification models, there does not appear to be a compelling need to do so at this time.

Information Need 1B2: Describe relationship between escapement and production including smolt production

Knowledge concerning escapement and adult production is adequate for all salmon species; while knowledge concerning escapement and smolt production is incomplete for sockeye and coho and lacking for all other species.

- The relationship between escapement and total adult production is generally well described for important sockeye, coho, and Chinook systems. Time series of escapement and total run data are available for 29 sockeye, 23 coho, and 5 Chinook river/lake systems. All but one of these data series (McLees Lake sockeye salmon) are for systems within the Kodiak and Alaska Peninsula management areas.

- The relationship between pink and chum salmon escapement and total adult production is described for aggregated runs to commercial fishing districts or sections. Time series of escapement and total run data are available for 14 pink and 13 chum salmon fishing districts as well as one pink and one chum salmon fishing section. All but one of these data series (Unalaska District pink salmon) are for districts and sections within the Kodiak and Alaska Peninsula management areas.
- The relationship between escapement and smolt production has been examined for several sockeye salmon systems, including Afognak, Karluk, Frazer, Malina, Red, Akalura, and Upper Station.

Consider proposals for sockeye and coho salmon.

- The relationship between escapement and adult production appears to be adequately described for important sockeye, Chinook, and coho runs. However, time series of reliable escapement estimates (Information Need 1A2) and total run estimates (Information Need 1A1) should continue to be collected so that changes in production can be detected.
- While the relationship between escapement and adult production has only been described for aggregations of pink and chum salmon runs, available information is adequate for management at current levels of exploitation.
- The relationship between escapement and smolt production has been adequately described for some sockeye salmon systems, but additional work should be considered for this species and coho salmon. While this information is lacking for the other salmon species, it is not needed to guide subsistence management.

Information Need 1B3: Determine the quantity of salmon by river/lake system needed to sustain ecosystem functions

Knowledge is incomplete for most salmon river/lake systems.

- Salmon play a vital role in shaping coastal ecosystems by transporting energy and nutrients from the ocean, and studies have traced the contribution of marine-derived nitrogen from salmon carcasses through components of both freshwater and terrestrial ecosystems. Effects of marine-derived nutrients can vary greatly based on such factors as physical characteristics of the ecosystem and availability of alternative nutrient sources.
- Both State and Federal fishery management agencies agree that the role of salmon in ecosystem functioning should be evaluated and considered in making management decisions and setting escapement goals. The Federal subsistence fishery management system conforms to Sustainable Fisheries Foundation criteria for developing sustainable salmon fisheries: a system of community-based, watershed-oriented councils, including all stakeholders and agency representatives. Additionally, the State has a regulatory Sustainable Salmon Fisheries Policy includes evaluation and consideration of the role of salmon in ecosystem functioning in harvest management decisions and setting escapement goals.
- Protocols and methods to determine the quantity of salmon needed to sustain ecosystem functions have not been developed. Initial efforts to determine escapement levels needed to sustain ecosystem funds have included attempts to estimate the amount of marine-derived

Information Need 1B3: continued

nutrients and organic matter needed to support juvenile salmon rearing habitat capacities or to saturate marine-derived nutrient levels in rearing juvenile salmon.

Do not consider proposals.

- This information need is incomplete, but it is not clear what additional studies could be done that would directly benefit management, and proposals should not be actively solicited in the Request for Proposals. However, as is done for any unsolicited proposal, proposals addressing this topic would be considered for funding if the investigator can demonstrate a clear link to subsistence management.

Information Need 1B4: Relate historic salmon harvests to current productivity levels of river/lake systems

Knowledge is adequate for sockeye salmon, but lacking for other salmon species in Kodiak, Alaska Peninsula, and Aleutian Islands river/lake systems.

- Historic salmon harvests are an important data component used to assess salmon escapement goals, but few studies have been done that relate historic harvests to system productivity. Results from studies on Karluk, Frazer, Akalura, and Red lakes, based on analysis of lake sediment cores, showed that sockeye salmon abundance fluctuated greatly overly hundreds of years, but that these changes appeared to be more strongly related to decadal climatic variability than harvests. Increased marine-derived nutrients fluxes do result in a higher capacity for Karluk Lake to produce sockeye salmon. Lake sediment core analyses, while useful to examine sockeye salmon productivity, are not applicable to other salmon species since they primarily spawn and rear in riverine systems. Studies concerning the quantity of adult salmon needed to sustain ecosystem functions (Information Need 1B3) provide some insight into potential effects of harvests on current productivity levels of watersheds. While marine-derived nutrients from salmon carcasses have been shown to affect productivity and composition of stream, riparian, and soil communities, the large amount of marine-derived nutrients stored in the riparian zone and soil along with internal cycling of these nutrients, could initially mask effects from long-term declines in salmon runs.

Do not consider proposals.

- No additional studies are needed for sockeye salmon nursery lakes. While this information need has not been addressed for salmon species that spawn and rear in rivers and streams, this information does not seem to be needed to guide management of these species. Also, it would be difficult or impossible to obtain undisturbed sediment cores that cover long time periods from rivers and streams. While there may be other techniques that could be used to examine the relationship between historic harvests and current productivity levels for rivers and streams, storage of marine-derived nutrients in the riparian zone would make it extremely difficult to obtain this information.

GOAL 2: ASSESS AND MONITOR SUBSISTENCE FISHERIES TO DOCUMENT USES

OBJECTIVE 2A: Document the current fishery

Information Need 2A1: Estimate annual subsistence use, harvest, and effort by location, gear type, species, and date

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Annual harvest estimates have been made since 1979 for subsistence salmon net fisheries based on information from permits as well as periodic household surveys and key respondent interviews. Information from earlier years is also available for some communities.
- The Monitoring Program funded a series of workshops (study 00-017) that reviewed and evaluated regional harvest monitoring programs, and developed a statewide subsistence harvest strategy. While findings indicated that permit harvest information is generally reliable for the Aleutian Islands Management Area, the existing program only covers two of the five management districts. Based on comparisons with household interview results, permit information provides only minimum estimates of harvests for both the Kodiak and Alaska Peninsula management areas. This under-reporting is due not only to people failing to obtain or correctly complete permits, but also to unreported subsistence harvests taken provided funding to address these problems and collect harvest data and traditional ecological knowledge for communities within the Alaska Peninsula and Aleutian Islands (02-032), and Kodiak (04-457) management areas.
- Three Monitoring Program projects (00-017, 01-107, and 04-751) have provided funding to the State for annual updating of the Alaska Subsistence Harvest Database and annual reporting of harvest information.

Consider proposals for Alaska Peninsula and Aleutian Islands management areas.

- Available information seems to be adequate to guide management for the Kodiak management area, and reporting problems are being addressed (also see Information Need 2A2). Information is incomplete for the Alaska Peninsula and Aleutian Islands management areas. Information is most notably lacking for three districts within the Aleutians management area.
- While funding may be needed after 2006 to continue annual updating of the Alaska Subsistence Harvest Database and annual reporting of harvest information, this is a statewide issue rather than an information need for any one management area.

Information Need 2A2: Improve reporting systems for Federal subsistence harvest

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

The Monitoring Program is providing funding to the State to address permit reporting problems in the Kodiak Management Area (project 04-457). The reporting systems for the Alaska Peninsula and Aleutian Islands management areas already provide reliable information for those districts covered. However, subsistence harvests taken from commercial landings and by rod

Information Need 2A2: continued

and reel fishing have not been accurately documented. Reporting of subsistence harvests taken from commercial landings is supposed to be done on commercial landing receipts (referred to as fish tickets) under existing State regulations. No provisions exist to report subsistence harvests taken by rod and reel. Residents using a rod and reel for subsistence fishing have done so with a State sport fishing license since this is not a recognized gear type for subsistence fishing under State regulations and Federal permits have not been required for rod and reel subsistence fishing on Federal public lands.

- The Monitoring Program has provided have provided funding to the State for annual updating of the Alaska Subsistence Harvest Database and annual reporting of harvest information (projects 00-017, 01-107, and 04-751). This funding has allowed 1999-2005 data to be added to the database and documented in reports.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- Results of project 04-457 need to be obtained before funding further work to improve the permit reporting system for the Kodiak Management Area. It is not clear what types of studies could be funded to correct reporting problems associated with subsistence harvests taken from commercial landings and by rod and reel fishing. Improvements in public education and outreach would probably improve compliance in reporting.
- While funding may be needed after 2006 to continue annual updating of the Alaska Subsistence Harvest Database and annual reporting of harvest information, this is a statewide issue rather than an information need for any one management area.

Information Need 2A3: Independently verify harvest data

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Several projects have used household surveys and key respondent interviews to independently verify harvest data collected from permits, and serious reporting problems have been identified for the Kodiak Management Area but not for the Alaska Peninsula and Aleutian Islands management areas. Problems with reporting subsistence harvests taken from commercial landings and taken by rod and reel fishing have also been identified in both the Kodiak and Alaska Peninsula management areas.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- Permit data has already been independently verified through household surveys and key respondent interviews, indicating that improvements were needed for the Kodiak Management area. Project 04-457, which seeks to improve Kodiak Management Area permit reporting, needs to be completed to determine the need for future data verification projects (Information Need 2A2).
- Household surveys and key respondent interviews have indicated that subsistence harvests obtained from rod and reel fishing and commercial catches are not completely reported. Additional verification studies are not needed until efforts are made to improve the accuracy of subsistence harvest data obtained from these sources.

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

Information Need 2B1: Identify environmental, demographic, regulatory, cultural, and socioeconomic factors affecting subsistence harvest levels

Knowledge is lacking for all management areas.

- Except for an Exxon Valdez Oil Spill Trustee Council study, there do not appear to be any other studies concerning factors affecting subsistence harvest levels for the Kodiak, Alaska Peninsula, and Aleutian Islands management areas.

Consider proposals.

- Studies need to be conducted to gain a better understanding of factors affecting subsistence harvest levels.

Information Need 2B2: Describe current and traditional harvest methods and means by species and area

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Current and traditional harvest methods and means have been well documented for most Kodiak but not all Alaska Peninsula and Aleutian Islands communities. Most of available information has been collected by State investigators and is available in various ADF&G technical papers and reports.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- No additional studies seem to be needed for Kodiak, but information for some Alaska Peninsula and Aleutian Islands communities may still be needed.

Information Need 2B3: Describe and document current and traditional uses and distribution practices

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Current and traditional uses have been well documented for most Kodiak communities. Most of this information is has been collected by State investigators and is available in various ADF&G technical papers and reports.
- Current and traditional distribution practices are not well documented, particularly for Alaska Peninsula and Aleutian Islands communities.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- No additional studies seem to be needed for Kodiak, but information for some Alaska Peninsula and Aleutian Islands communities may still be needed.

OBJECTIVE 2C: Project future use patterns.

Information Need 2C1: Gather local perspectives on future use patterns

Knowledge is lacking all management areas.

- No studies concerning local perspectives on future use patterns appear to have been conducted.

Do not consider proposals.

- While information is lacking, there does not appear to be a pressing need to conduct studies to specifically obtain this information.

Information Need 2C2: Evaluate key factors influencing future use patterns

Knowledge is lacking for all management areas.

- No studies concerning key factors influencing future use patterns appear to have been conducted.

Consider proposals.

- Studies are needed to evaluate key factors influencing future use patterns.

Information Need 2C3: Build process based models to predict future use patterns

Knowledge is lacking for all management areas.

- No studies concerning local perspectives on future use patterns appear to have been conducted.

Do not consider proposals.

- While studies would be needed to build models to predict future use patterns, such models cannot be developed until data is available from addressing information needs 2C1 and 2C2.

GOAL 3: EFFECTIVE MANAGEMENT TO PROVIDE FOR SUBSISTENCE USES

OBJECTIVE 3A: Develop and evaluate management strategies for subsistence harvest

Information Need 3A1: Examine effectiveness of current regulations for subsistence harvests

Knowledge is adequate for all management areas.

- The Federal Subsistence Board evaluates usefulness and effectiveness of subsistence fishing regulations in considering regulatory proposals using information from agencies, Regional Advisory Councils, and users.
- Information exists that support the State of Alaska's spawning escapement goal and sustainable salmon fisheries regulatory policies.

Do not consider proposals.

While there appears to be little published information and few studies available on the usefulness and effectiveness of subsistence fishing regulations, this issue is usually adequately addressed

Appendix G. Continued.

Information Need 3A1: continued

through the Federal Subsistence Board process, with input from agencies, Advisory Councils, and users, when considering changes to existing or setting new regulations. There does not seem to be a need at this time to conduct any studies to evaluate effectiveness of current regulations.

Information Need 3A2: Develop real-time information sharing among user groups and agencies

Knowledge is incomplete for all management areas.

- The Monitoring Program supports development of all forms of information sharing, including written reports, oral and poster presentations, databases; websites, and workshops. The Alaska Subsistence Fisheries Database is maintained on the Internet by ADF&G, and annual updates for 2001-2005, as well as inclusion of pre-1988 data and GIS enhancements have been funded thorough the Monitoring Program (studies 01-107, 02-043, and 04-751). Searchable inventories of subsistence fishery-related reports and publications are maintained on the Internet by the Office of Subsistence Management (Monitoring Program reports), ADF&G, USGS, and University of Washington (School of Aquatic and Fisheries Science). The Monitoring Program also funded a study (01-154) that allowed ADF&G to develop and test a prototype, as well as estimate of costs, for implementing an interactive, integrated, web-based information system.
- Collections of scales and otoliths, along associated age, sex, and length data, are maintained by ADF&G and University of Washington (School of Aquatic and Fisheries Science). Associated databases will eventually be available on the Internet.
- The North Pacific Marine Science Organization (PICES) is developing a metadatabase to serve as a gateway for accessing data, reports, databases, catalogs, proposals, and other media on ecosystems of the North Pacific.

Do not consider proposals.

- Before considering proposals, efforts are needed to evaluate the effectiveness of existing real-time information sharing efforts, including the degree to which databases and other forms of information sharing are being used.
- Existing databases need to be maintained and updated to ensure continued usefulness. Annual updates, expansion, and enhancements of the Alaska Subsistence Fisheries Database, maintained by ADF&G, are supported with Monitoring Program funding only through 2005. The usefulness of developing a metadatabase for subsistence fisheries information, similar to ongoing efforts for PICES, could also be examined.

Information Need 3A3: Examine alternative management strategies

Knowledge is incomplete for all management areas.

Information on alternate management strategies is not available for Kodiak, Alaska Peninsula, and Aleutian Islands management areas. However, the Sustainable Fisheries Foundation has been coordinating and supporting efforts to develop a general strategy for sustainable salmon fisheries based on an ecosystem-based approach to managing human activities. To transition to this approach, the Foundation recommends adoption of a system of community-based,

Information Need 3A3: continued

watershed-oriented councils that include all stakeholders and agency representatives, an development of specific management objectives that include quantifiable measures of progress.

Do not consider proposals.

- Information is lacking on alternative management strategies for Federal subsistence fisheries, in Kodiak, Alaska Peninsula, and Aleutian Islands management area. However, before considering study proposals, alternative management strategies should first be examined through the Federal Subsistence Board process, with input from agencies, Advisory Councils, and users. Also, agencies and stakeholders should keep informed, and become involved as needed, in larger efforts exploring collaborative management, including those being pursued by the Sustainable Fisheries Foundation.

OBJECTIVE 3B: Assess impacts of other fisheries

Information Need 3B1: Describe socioeconomic impacts of other fisheries

Knowledge is incomplete for all management areas.

- While other fisheries can potentially impact subsistence fisheries, little information assessing socioeconomic impacts have not been conducted for these management areas. While the Regional Advisory Council has expressed concerns on effects of commercial fishing on smaller, unmonitored sockeye salmon runs within Olga Bay, regulations and management actions have been developed to avoid impacting subsistence fishing opportunities and to conserve all stocks. Subsistence users in these management areas have voiced concerns about impacts of other fisheries, although no regulatory proposals have been submitted to the Federal Subsistence Board.

Consider proposals.

- Socioeconomic impacts of other fisheries on subsistence fisheries may need to be better understood so that problems can be addressed. Information on impacts from other fisheries may also be obtained in conjunction with Information Needs 2B1and 3A1.

Information Need 3B2: Describe harvest rates by fishery for specific stocks of interest

Knowledge is adequate for chum and pink salmon, but incomplete for sockeye, coho, and Chinook salmon.

- Total harvest rate estimates are available for some large salmon runs within the Kodiak and Alaska Peninsula management areas, but are not available for most runs within the Aleutian Islands Management Area. However, most Aleutian Island salmon stocks, which are primarily pink and chum salmon, are managed in aggregate rather than individually due to lack of intensive fisheries. In general, total harvest rate estimates will become more accurate as stock identification methods are improved and more widely used.

Appendix G. Continued.

Information Need 3B2: continued

Consider proposals for sockeye, coho, and Chinook salmon.

- Harvest rates may need to be better described for certain sockeye, coho, and Chinook salmon stocks. Information on harvest rates may also be obtained in conjunction with Information Needs 1A1, 1B2, 2A1, 2 B1, and 3B1.

Appendix H. Information inventory for Kodiak-Aleutians non-salmon fisheries unit.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A1 Identify environmental, demographic, regulatory, cultural, and socioeconomic factors affecting subsistence fishing levels						
1	Subsistence Harvests by Kodiak Island Borough Communities (ADFG Technical Papers 193, 199, 200, 201, 202, 218, and 252)	ADFG - S J.A. Fall	Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions	all	Conducted household surveys to document subsistence harvests and uses; including effects of 1989 Exxon Valdez oil spill on subsistence harvests, uses, and fish stock status.	1986-1987, 1989-1998, 2004, and 2005
2	Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge (FIS 02-032)	ADFG - S D. Davis	Cold Bay, False Pass, King Cove, Nelson Lagoon, Sand Point, Adak, Akutan, Atka, Nikolski, and Unalaska	all	Conducted household surveys to document subsistence harvests and uses; including effects of 1989 Exxon Valdez oil spill on subsistence harvests, uses, and fish stock status.	2002-2003
3	Noncommercial harvest and uses of wild resources in King Cove (ADFG Technical Paper 227)	ADFG - S R. Mason	King Cove	all	Conducted household surveys to document patterns of subsistence uses of fish, game, and plant resources as well as economic information; interviewed key informants to obtain information on subsistence use areas.	1992-1993

Appendix H. Continued

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A2	**Describe current and historic fishing methods and means by species and area**					
4	Harvest and use of fish, wildlife, and plant resources in False Pass (ADFG Technical Paper 183)	ADFG – S J.A. Fall	False Pass, Unimak Island	all	Conducted a household survey to collect information on harvest levels, levels of participation in harvest activities, the seasonal round of harvest activities, and harvest methods; also developed maps of subsistence use areas, and obtained economic and historical information.	1988
5	Resource utilization in Atka (ADFG Technical Paper 88)	ADFG – S D.W. Veltre	Atka	all	Documentation of historic and contemporary food and uses of local resources, including an inventory of resources used, methods by which they were obtained, and patterns of distribution and use in the community.	1983
Also see study numbers 1-3						

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3	**Describe and document traditional and current uses and distribution practices including sharing barter, and trade**					
6	Preliminary baseline study of subsistence resource utilization in the Pribilof Islands (ADFG Technical Paper 57)	ADFG – S D.W. Veltre	Pribilof Islands (St. Paul and St. George)	all	Documentation of resources used for food, harvest methods, harvest quotas, and uses of the resource.	1981
7	Noncommercial harvest and uses of wild resources in Sand Point, Alaska (ADFG Technical Paper 226)	ADFG - S D.B. Andersen	Sand Point	all	Conducted interviews with 104 randomly selected households to collect harvest and use information, and with key informants to collect information about local subsistence use areas.	1992
8	Nelson Lagoon resource use (ADFG Technical Paper 182)	ADFG - S R.T. Stanek	Nelson Lagoon	all	Conducted household interviews to document subsistence harvest and use; also developed maps of subsistence use areas.	1986-1987

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1A3 Describe and document traditional and current uses and distribution practices including sharing barter, and trade (continued)						
9	Resource utilization in Unalaska (ADFG Technical Paper 58)	ADFG - S D.W. Veltre	Unalaska	all	Documentation of harvest, distribution, preparation, and consumption of subsistence food resources; discussed past resource use based on archaeological and ethnographic literature as well as current use of various resources.	1982
Also see study numbers 1-6						

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1	**Periodically (three to five years) estimate subsistence use, harvest, and effort by location, gear type, species, and date**					
10	Statewide subsistence fisheries harvest monitoring strategy (FIS 00-017)	ADFG - S J. Fall	Alaska	all	Review and evaluation of subsistence fisheries and harvest assessment programs (including methods and reporting standards) through regional workshops; development of recommendations for a unified strategy for assessing subsistence fisheries harvests (including training programs to implement cooperative harvest assessment programs); production of 1999 annual subsistence fisheries report; and update of Alaska Subsistence Fisheries Database with 1999 data.	2000

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
1B1 Periodically (three to five years) estimate subsistence use, harvest, and effort by location, gear type, species, and date (continued)						
11	Implementation of Statewide Subsistence Fisheries Harvest Assessment Strategy (FIS 01-107)	ADFG - S J. Fall	Alaska	all	Review of study 00-017 recommendations, harvest assessment methods, and data usage through regional workshops; determination of need for subsistence harvest assessment program operational plans; production of 2001 and 2002 annual subsistence fisheries reports; and update of Alaska Subsistence Fisheries Database with 2001 and 2002 data	2001-2003
Also see study numbers 1-9						
1C1 Gather local perspectives on future use patterns						
No studies						
1C2 Evaluate key factors influencing future use patterns						
No studies						

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A1	**Identify stocks**					
12	Genetic population structure of steelhead trout of Kodiak Island. (USFWS Fisheries Technical Report 54)	USFWS - GCL S. Miller	Kodiak NWR	steelhead	Mitochondrial DNA variation in steelhead collections from the Kodiak NWR.	1999
13	Genetic population structure of steelhead and rainbow trout of the Aleutian Islands.	USGS - ASC J. Nielsen	Aleutian Islands, Alaska Maritime NWR	rainbow trout - steelhead	Collection of fin tissue samples for genetic analyses of relationship between resident rainbow trout and anadromous steelhead in different populations. Comparison of evolutionary genetics of Aleutian steelhead with steelhead in other parts of Alaska, the Pacific Northwest, California, and the Kamchatka Peninsula.	ongoing
Also see study numbers 14, 15, 19, and 20						
2A2	**Estimate abundance and composition**					
14	Buskin River Dolly Varden (ADFG Fishery Data Series Reports 30, 42, 102, 90-41, 91-68, 92-29, and 93-14)	ADFG – SF M.E. Whalen	Buskin River, Alaska Maritime NWR	Dolly Varden	Assessment of Dolly Varden entering Buskin River.	1986-1993

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A2	**Estimate abundance and composition (continued)**					
15	Karluk River steelhead (ADFG Fishery Data Series Reports 92-56, 93-56, 95-1, 95-41, 97-6)	ADFG – SF R.N. Begich	Karluk River, Kodiak NWR	Rainbow trout-Steelhead	Estimation of Karluk River steelhead spawning population based on mark-recapture experiments and post-spawning population based on weir counts, including documentation of first time and repeat spawners, mean length, and survival of males and females.	1992-1995
16	Assessment and monitoring of anadromous fish at Summer Bay Lake, Unalaska Island, after the M/V Kuroshima oil spill (ADFG Regional Information Reports 4K98-44, 4K99-62 and 4K00-63, 4K01-33)	ADFG - CF J.N. McCullough	Summer Bay Lake, Unalaska Island, Alaska Maritime NWR	Dolly Varden	Monitoring of juvenile and adult salmon production following 1997 M/V Kuroshima oil spill.	1998-1999
17	Documentation and evaluation of methods used to estimate rainbow trout ages from scales (ADFG Special Publication 98-2 and Fisheries Data Series Report 94-26)	ADFG – SF J. Dye	Bristol Bay	rainbow trout	Documentation and evaluation of aging methods, including protocol used by ADFG to sample, sort, clean, mount, press, and age scales, including a standardized method to train scale readers.	1990's

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2A3 Characterize life history, distribution, and timing						
18	Taxonomy and habits of the charrs of the Karluk drainage system (Transactions of the North American Fisheries Society 72: 79-91)	UW - FRI A.C. DeLacy	Karluk River, Kodiak NWR	Dolly Varden and Arctic char	Description of taxonomy and life history information of char.	1943
Also see study numbers 14, 15, and 19						
2B1 Describe critical factors that affect population dynamics						
19	Effects of global warming on the distribution of steelhead trout populations (USFWS Alaska Fisheries Technical Report 33)	USFWS - KSFWO F.J. Adams	Six systems, including four within Alaska Peninsula NWR: Meshik Sandy, and Sapsuk rivers; Russell Creek	rainbow/ steelhead trout	Documentation of steelhead trout presence, abundance; size, age, and sex composition; and water temperatures in six systems to monitor long-term changes due to global warming.	1991 -1994
20	Fishery survey of lakes and streams on Izembek and Alaska Peninsula National Wildlife Refuges (USFWS Alaska Fisheries Technical Reports 1 and 20)	USFWS - KSFWO F.J. Adams	Nine lakes and streams within Izembek NWR and Alaska Peninsula NWR	all	Documentation of fish populations using nets, traps, electrofishing, carcass recovery, and angling; and physical and chemical characteristics of lakes and streams using standard hydrological, limnological, and water quality methods.	1985 and 1986

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2B1	**Describe critical factors that affect population dynamics (continued)**					
21	Electrofishing induced mortality and injury to rainbow trout, Arctic grayling, humpback whitefish, least cisco, and northern pike (ADFG Fishery Manuscript 90-3, 92-3, and 96-1)	ADFG – SF S.M. Roach	Statewide application	rainbow trout, Arctic grayling, hump-back whitefish, least cisco, and northern pike	Determination of injuries, survival, growth and capture rates of fishes caused by pulsed direct current electrofishing; and determination of egg mortality caused by electroshocking parents or eggs at different developmental stages.	1990 and 1996
22	Mortality of Arctic char and large Arctic grayling captured and released with sport fishing gear (ADFG Fishery Data Series Report 93-1)	ADFG – SF T.R. McKinley	Statewide application	Arctic grayling and Arctic char	Conducted hatchery experiments to estimate mortality of Arctic grayling and char captured with five commonly used lures.	1993

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
2B1 Describe critical factors that affect population dynamics (continued)						
23	Effects of catch-and-release fishing on the physiology and hooking injury of rainbow trout	USGS - ASC/BSO J. Meka	Alagnak River – Statewide application	Rainbow trout	Examination of catch-and-release fishing effects by assessing incidence of hooking injury and measuring immediate physiological stress response to duration of angling and handling during hook removal. Addresses issues of whether different tackle, methods (fly vs. spin), time fish are played and landed, experience of anglers, and water temperature influence physiological stress levels and hooking injuries in rainbow trout.	ongoing
2B2 Describe trends in stocks						
Also see study numbers 14 and 15						
3A1 Develop real-time information sharing among user groups and agencies						
No studies						
3A2 Examine effectiveness of current regulations						
No studies						

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3A3	**Examine alternative management strategies**					
24	Subsistence as an economic system in Alaska: Theoretical and policy implications (ADFG Technical Paper 67)	ADFG - S D. Lonner	Alaska	all	Attempt to better define subsistence use in Alaska by drawing upon research findings in economic anthropology, and to describe implications for subsistence management.	1980
3B1	**Describe total harvest rates by fishery for specific stocks of interest**					
25	Buskin River Dolly Varden sport effort and harvest (ADFG Fishery Data Series Reports 30, 42, and 102; Federal Aid in Fish Restoration, Annual Performance Report, Project F-9-18(27)T-4-1)	ADFG – SF J.B. Murray	Buskin River	Dolly Varden	Documentation of sport fishing harvest and effort.	1986-1988
26	Statewide Harvest Survey of sport fishing catch and effort	ADFG - SF/RTS D. Bernard	Statewide	all	Estimation of annual sport catches and harvests from responses to a mailed survey.	ongoing
27	Statewide logbook program for guided freshwater sport fishing catch and effort	ADFG – SF/RTS D. Bernard	Statewide	all	Compilation of annual guided sport fishing harvest records for all salmon fisheries from a mandatory logbook program for guides.	ongoing since 2005

Appendix H. Continued.

Study Number and Title		Lead Agency/ Organization	Location	Species	Description	Duration
3B1 Describe total harvest rates by fishery for specific stocks of interest (continued)						
28	Commercial and sport harvests of Karluk River steelhead (ADFG Fishery Data Series Report 92-56, 93-56, 95-41, 97-6)	ADFG – SF R.N. Begich	Karluk River and southwest Kodiak Island, Kodiak NWR	Rainbow trout - Steelhead	Documentation of incidental steelhead harvests through sampling of commercial gillnet and purse seine catches from selected waters along southwest Kodiak Island and sport angler interviews at Portage area of the Karluk River.	1995
Also see study numbers 1-11						
3B2 Describe socioeconomic and cultural impacts of other fisheries						
See study numbers 23-25						
Information Databases						
Fisheries Resource Monitoring Program database		OSM - FIS V. McClain	Alaska	all	Maintenance of reports and other products resulting from FRMP studies. Copies of reports can be downloaded from a website.	ongoing since 2000

Appendix H. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
Alaska Subsistence Harvest Database and reporting	ADFG - S R. Walker	Alaska	all	Maintenance of searchable database of subsistence fisheries harvest information and publication of annual reports. Database can be accessed from a website and is available on CD.	ongoing since 1980
Alaska Subsistence Harvest Database GIS integration (FIS 02-043)	ADFG - S B. Davis	Alaska	all	Integration of Alaska Subsistence Fisheries Database records with a system of maps depicting communities and harvest locations. Database is available on CD.	2002-2003
Alaska Subsistence Harvest Database update and report preparation (FIS 04-751)	ADFG - S R. Walker	Alaska	all	Update of Alaska Subsistence Fisheries Database with 2003-2005 salmon data, historic (pre-1988) salmon data; 2003-2005 non-salmon fish and marine invertebrate data, and historic (pre-2003) non-salmon data.	2004-2006

Appendix H. Continued.

Study Number and Title	Lead Agency/ Organization	Location	Species	Description	Duration
Information Databases (continued)					
ADFG publications database	ADFG - S, SF, CF K. Savikko	Alaska	all	Maintenance of reports and other products resulting from work conducted by ADFG staff. Copies of reports can be downloaded from a website	ongoing
Project information and access system (FIS 01-154)	ADFG - SF S. Darr	Alaska	all	Development of prototype for a web-based searchable information system for studies, project manager contacts, and publications.	2001-2002
University of Washington, School of Aquatic and Fisheries Science publications database	UW - SAFS C. Boatright	Pacific Coast of North America	all	Maintenance of reports and other products resulting from work conducted by UW-SFAS staff.	ongoing since 1973
Exxon Valdez Trustees Council publications database	Exxon Valdez Oil Spill Trustees Council	Areas affected by 1989 oil spill, including Kodiak	all	Maintenance of reports and other products resulting from Exxon Valdez oil spill damage assessment and restoration work. Copies of reports can be downloaded from a website.	ongoing since 1989

Appendix I. Knowledge gap analysis results for Kodiak-Aleutians non-salmon subsistence fisheries unit, 2006.

GOAL 1: ASSESS AND MONITOR FEDERAL SUBSISTENCE FISHERIES TO DOCUMENT SUBSISTENCE USES

OBJECTIVE 1A: Identify and describe past and present subsistence harvest use patterns

Information Need 1A1: Identify environmental, demographic, regulatory, cultural, and socioeconomic factors affecting subsistence harvest levels

Knowledge is lacking for all management areas.

- Except for an Exxon Valdez Oil Spill Trustee Council study, there do not appear to be any other studies concerning factors affecting subsistence harvest levels for the Kodiak, Alaska Peninsula, and Aleutian Islands management areas.

Consider proposals for all management areas.

- Studies need to be conducted to gain a better understanding of factors affecting subsistence harvest levels. Because these factors change over time, they need to be examined on a cyclical basis.

Information Need 1A2: Describe current and traditional harvest methods and means by species and area

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Current and traditional harvest methods and means have been documented for many, but not all, communities in the area. Most of this information has been collected by State investigators and is available in various ADF&G technical papers and reports.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- No additional studies seem to be needed for Kodiak, but information for some Alaska Peninsula and Aleutian Islands communities may still be needed.

Information Need 1A3: Describe and document current and traditional uses and distribution practices

Knowledge is adequate for Kodiak, but incomplete for the Alaska Peninsula and Aleutian Islands management areas.

- Current and traditional uses have been well documented for most Kodiak communities. Most of this information has been collected by State investigators and is available in various ADF&G technical papers and reports.
- Current and traditional distribution practices are not well documented, particularly for Alaska Peninsula and Aleutian Islands communities.

Consider proposals for the Alaska Peninsula and Aleutian Islands management areas.

- No additional studies seem to be needed for Kodiak at this time, but information for some Alaska Peninsula and Aleutian Islands communities may still be needed. This information should be collected on a cyclical basis, such as every 10 years, to document any changes.

OBJECTIVE 1B: Document the current fishery

Information Need 1B1: Periodically (three to five years) estimate subsistence use, harvest, and effort by location, gear type, species, and date

Knowledge is adequate for all management areas.

- Harvest estimates of non-salmon fishes are available from household surveys and key respondent interviews since the 1980's, although most efforts have focused on salmon rather than non-salmon fishes. Permits are not required for recording harvests of non-salmon fishes, and salmon permits do not provide space for recording information on non-salmon species.
- The Monitoring Program funded a series of workshops (project 00-017) that reviewed and evaluated regional harvest monitoring programs and developed a statewide subsistence harvest strategy. Specific recommendations for these three management areas did not include the need for improved harvest monitoring for non-salmon fishes.
- The Monitoring Program provided funding (project 04-751) to the State to include non-salmon fish harvest information in the Alaska Subsistence Harvest Database and in annual reports for 2003-2005.

Do not consider proposals.

- Available information seems to be adequate to guide management.
- While funding may be needed after 2006 to continue annual updating of the Alaska Subsistence Harvest Database and annual reporting of harvest information, this is a statewide issue rather than an information need for any one management area.

OBJECTIVE 1C: Project future use patterns

Information Need 1C1: Gather local perspectives on future use patterns

Knowledge is lacking for all management areas.

- No studies concerning local perspectives on future use patterns appear to have been conducted.

Do not consider proposals.

- While information is lacking, there does not appear to be a pressing need to conduct studies to specifically obtain this information. This information could also be obtained in conjunction with studies addressing other needs. For example, studies on impacts of other fisheries (Information Need 3B1), might obtain information on both current and potential future impacts on subsistence fisheries.

Information Need 1C2: Evaluate key factors influencing future use patterns

Knowledge is lacking for all management areas.

- No studies concerning key factors influencing future use patterns appear to have been conducted.

Consider proposals.

- Studies are needed to evaluate key factors influencing future use patterns.

GOAL 2: OBTAIN BIOLOGICAL INFORMATION TO PROVIDE FOR SUBSISTENCE USES

OBJECTIVE 2A: Describe biology and assess stocks

Information Need 2A1: Identify stocks

Knowledge is adequate for rainbow/steelhead trout, but incomplete for Dolly Varden/Arctic char.

- For rainbow/steelhead trout, information is available on runs within all three management areas, and on genetic structure of stocks in the Kodiak and Aleutian Islands management areas.
- For Dolly Varden/Arctic char, there is some information on runs to the Buskin and Karluk rivers, but genetic stock structure information seems to be lacking for all three management areas.

Consider proposals for Dolly Varden/Arctic char.

- For rainbow/steelhead trout, all runs have been identified, and, while additional work on genetic stock structure could help better identify stocks, available information is adequate for subsistence management.
- For Dolly Varden/Arctic char, additional work is needed to better define spawning populations and determine the stock composition of wintering aggregations and harvests.

Information Need 2A2: Estimate abundance and composition

Knowledge is incomplete for rainbow trout/steelhead trout and Dolly Varden/Arctic char.

- For rainbow/steelhead trout, abundance and composition estimates are available for Karluk River steelhead trout.
- For Dolly Varden/Arctic char, abundance and composition estimates are available for Buskin River Dolly Varden.

Consider proposals for Dolly Varden/Arctic char in the Alaska Peninsula and Aleutian Islands management areas.

- Subsistence harvests of Dolly Varden/Arctic char appear to be increasing on Unalaska Island, but information on stock abundance and composition is lacking. Without this information, managers do not know whether increasing harvest levels are sustainable.

Appendix I. Continued.

Information Need 2A3: Characterize life history, distribution, and timing

Knowledge is incomplete for rainbow/steelhead trout and Dolly Varden/Arctic char.

- For rainbow/steelhead trout, distribution information is available for most populations and runs, while life history and timing information seem to be available only for Buskin and Karluk rivers steelhead trout.
- For Dolly Varden/Arctic char, distribution information is available for most populations and runs, while life history and timing information seem to be available only for Buskin River and Karluk rivers Dolly Varden.

Consider proposals for Dolly Varden/Arctic char in the Alaska Peninsula and Aleutian Islands management areas.

- As was noted above for Information Need 1A2, subsistence harvests of Dolly Varden/Arctic char appear to be increasing on Unalaska Island, but information on these stocks, including life history, distribution, and timing, is lacking. Without this information, managers do not know whether increasing harvest levels are sustainable.

OBJECTIVE 2B: Determine stock dynamics

Information Need 2B1: Describe critical factors that affect population dynamics

Knowledge is incomplete for rainbow/steelhead trout and Dolly Varden/Arctic char.

- For rainbow/steelhead trout, information on effects of sport fishing and potential effects of global warming is available.
- For Dolly Varden/Arctic char, information on effects of sport fishing is available.

Do not consider proposals.

- For rainbow/steelhead trout and Dolly Varden/Arctic char, while information on critical factors is incomplete, it appears to be adequate for subsistence management.

Information Need 2B2: Describe trends in stocks

Knowledge is incomplete for rainbow/steelhead trout and Dolly Varden/Arctic char.

- For rainbow/steelhead trout and Dolly Varden/Arctic char, trend information is available only for Buskin and Karluk rivers.

Do not consider proposals.

- For rainbow/steelhead trout and Dolly Varden/Arctic char, while trend information is incomplete, available information appears to be adequate for subsistence management.

GOAL 3: EFFECTIVE MANAGEMENT TO PROVIDE FOR SUBSISTENCE USES

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

Information Need 3A1: Develop real-time information sharing among user groups and agencies

Knowledge is incomplete for all management areas.

- The Monitoring Program supports development of all forms of information sharing, including written reports, oral and poster presentations, databases; websites, and workshops. The Alaska Subsistence Fisheries Database is maintained on the Internet by ADF&G, and annual updates for 2001-2005, as well as inclusion of pre-2003-2005 non-salmon fisheries data and GIS enhancements have been funded thorough the Monitoring Program (studies 01-107, 02-043, and 04-751). Searchable inventories of subsistence fishery-related reports and publications are maintained on the Internet by the Office of Subsistence Management (Monitoring Program reports), ADF&G, USGS, and University of Washington (School of Aquatic and Fisheries Science). The Monitoring Program also funded a study (01-154) that allowed ADF&G to develop and test a prototype, as well as estimate of costs, for implementing an interactive, integrated, web-based information system.
- Collections of scales and otoliths, along with associated age, sex, and length data, are maintained by ADF&G and University of Washington (School of Aquatic and Fisheries Science). Associated databases will eventually be available on the Internet.
- The North Pacific Marine Science Organization (PICES) is developing a metadatabase to serve as a gateway for accessing data, reports, databases, catalogs, proposals, and other media on ecosystems of the North Pacific.

Do not consider proposals.

- Before considering proposals, efforts are needed to evaluate the effectiveness of existing real-time information sharing efforts, including the degree to which databases and other forms of information sharing are being used.
- Existing databases need to be maintained and updated to ensure continued usefulness. Annual updates, expansion, and enhancements of the Alaska Subsistence Fisheries Database, maintained by ADF&G, are supported with Monitoring Program funding only through 2005. The usefulness of developing a metadatabase for subsistence fisheries information, similar to ongoing efforts for PICES, could also be examined.

Information Need 3A2: Examine the effectiveness of current regulations for Federal subsistence harvests

Knowledge is incomplete for all management areas.

- The Federal Subsistence Board evaluates usefulness and effectiveness of subsistence fishing regulations in considering regulatory proposals using information from agencies, Regional Advisory Councils, and users.

Do not consider proposals.

- While there appears to be little published information and few studies available on the usefulness and effectiveness of subsistence fishing regulations, this issue is usually adequately addressed through the Federal Subsistence Board process, with input from agencies, Advisory Councils, and users, when considering changes to existing or setting new regulations. There does not seem to be a need at this time to conduct specific studies to evaluate effectiveness of current regulations.

Information Need 3A3: Examine alternative management strategies

Knowledge is incomplete for all management areas.

- Information on alternate management strategies is not available for Kodiak, Alaska Peninsula, and Aleutian Islands management areas. However, the Sustainable Fisheries Foundation has been coordinating and supporting efforts to develop a general strategy for sustainable salmon fisheries, including steelhead trout, based on an ecosystem-based approach to managing human activities. To transition to this approach, the Foundation recommends adoption of a system of community-based, watershed-oriented councils that include all stakeholders and agency representatives, and development of specific management objectives that include quantifiable measures of progress.

Do not consider proposals.

- Information is incomplete on alternative management strategies for Federal subsistence fisheries in the Kodiak, Alaska Peninsula, and Aleutian Islands management area. However, before considering study proposals, alternative management strategies should first be examined through the Federal Subsistence Board process, with input from agencies, Advisory Councils, and users. Also, agencies and stakeholders should keep informed, and become involved as needed, in larger efforts exploring collaborative management, including those being pursued by the Sustainable Fisheries Foundation.

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

Information Need 3B1: Describe total harvest rates by fishery for specific stocks of interest

Knowledge is incomplete for all management areas.

- Total harvest rate estimates are available for Karluk River steelhead trout and Buskin River Dolly Varden. In general, total harvest rate estimates will become more accurate as stock identification methods are improved and more widely used.

Consider proposals.

- This information is incomplete for most rainbow/steelhead trout and Dolly Varden/Arctic char runs, and information may be needed for some stocks.

Appendix I. Continued.

Information Need 3B2: Describe socioeconomic impacts of other fisheries

Knowledge is incomplete for all management areas.

- While other fisheries can potentially impact subsistence fisheries, little information on socioeconomic impacts is available for these management areas. However, subsistence users in these management areas have not voiced concerns about impacts of other fisheries on either rainbow/steelhead trout or Dolly Varden/Arctic char runs. High seas harvests are not thought to greatly affect subsistence fisheries for either steelhead trout or Dolly Varden.

Do not consider proposals.

- There does not seem to be a need for studies on socioeconomic impacts of other fisheries at this time. Information on impacts from other fisheries may also be obtained in conjunction with Information Needs 2B1and 3B1.