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YUKON RIVER
JOINT TECHNICAL COMMITTEE
PLAN

By

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AUTHORS

Joint Technical Committee, as the primary author, designed, wrote, and reviewed the plan. Numerous JTC members provided pictures and comments. Susan McNeil wrote the text and compiled the strategic plan and the supporting materials.

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Thanks also go to Linda Brannian who initiated the planning process, and to Dr. Margaret Merritt who walked the JTC through the planning process, used the Analytic Hierarchy Process to prioritize JTC projects, and wrote a plan report. Thanks to the whole JTC, which worked through the initial planning workshop, and especially the subcommittee members listed below who spent many hours over a two year period prioritizing and discussing plan elements:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

The Joint Technical Committee (JTC) of the Yukon River Panel organized priorities for research and investigations as mandated by the Yukon River Salmon Agreement. Dr. Margaret Merritt facilitated the initial planning process in 2002 using the Analytic Hierarchy Process and Expert Choice software. The JTC met twice in early 2002 to work on the plan, and Dr. Merritt drafted a plan from the work completed to that point. At its fall 2002 meeting, the JTC agreed that the draft plan needed additional work and formed an ad hoc subcommittee to redraft the plan for subsequent consideration by the full JTC. The plan subcommittee met periodically in 2003 and 2004 to work on the plan, refining its structure and prioritizing the elements within the new structure using similar techniques. Existing field projects were entered into the plan under appropriate issues to facilitate a gap analysis. Myriad projects directly support fishery management and therefore the highest priority was given to escapement and harvest strategies used for management of the fisheries throughout the drainage. The gap analysis revealed strategies for additional studies, research or programs. A glossary unique to the JTC Strategic Plan is included.

Key Words: Yukon River, Joint Technical Committee, JTC Plan, Chinook salmon, fall chum salmon, Yukon River Panel

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INTRODUCTION

Chinook and fall chum salmon that spawn in Canada traverse the nearly 2,000-mile/3,200 km length of the Yukon River, which drains northwestern British Columbia, Yukon Territory, and Alaska. Ecological variability of the drainage ranges from clear, shallow mountain streams to broad silty, deep rivers at the delta. The river empties into Norton Sound and into the Bering Sea (Figure 1). Villagers throughout the drainage fish for salmon during the annual migration each summer and fall; cultures, livelihoods, and subsistence are dependent on this resource. Two different countries have federal, state, territorial, or provincial jurisdiction, and numerous First Nations have territorial jurisdiction on different parts of the river.

The fishing seasons between 1998-2000 were characterized by a significant decrease in the number of Chinook salmon caught in all Yukon River fisheries, from over 198,000 in 1995 to only 105,000 in 1998 and just over 50,000 in 2000 (JTC 2002). Managers restricted the amount of time fishers were allowed to have gear in the water. Some fisheries were closed entirely in some years. These low salmon returns provided impetus to resume Yukon River Canadian-origin salmon negotiations between the US and Canada. Everyone involved in the Yukon River fisheries, their research and conservation, wanted to preserve the salmon runs. After sixteen years of negotiations, both countries agreed on steps for cooperation to ensure the conservation, restoration and enhancement of salmon species spawning in Canadian waters. The Yukon River Salmon Agreement was initialed March 2001 in Whitehorse and signed by representatives of both governments in Washington DC, December 2002. The Agreement, Chapter 8 of the Pacific Salmon Treaty, formally established the Yukon River Panel (Panel) and Joint Technical Committee (JTC) and assigns them continuing duties to fulfill the agreed needs to conserve, manage, restore and enhance Canadian origin, Yukon River salmon populations.

Yukon River Panel

The Yukon River Panel, comprised of representatives from the US and Canada, has a primary responsibility to review each country's fishery management performance. Besides monitoring the coordinated management and harvest sharing of Canadian-origin Chinook and chum salmon, the Panel may make a number of recommendations to the respective management entities including: interim spawning escapement objectives; improvements to management regimes; stock rebuilding plans; and research and management plans and programs. Another important task is to manage the Restoration and Enhancement (R&E) Fund, which receives approximately $1.2 million annually contributed by the US as part of the Agreement. The Panel solicits proposals for projects to the R&E Fund, reviews each R&E project and decides, after consideration of advice from the JTC, which projects to fund each year. The Panel hired a consultant to help them design a plan and framework for budgeting this Fund think about their priorities for projects (Blewett 2003).

Joint Technical Committee

Established in 1985 as a scientific advisory body to the Advisors of both countries involved in the Yukon River Treaty negotiations, and now advising the Yukon River Panel, the Joint Technical Committee (JTC) applies scientific expertise to deal with complex problems. Comprised of representatives from US and Canadian government agencies and non-governmental organizations, the committee meets semiannually to discuss harvest and escapement goals, management trends, and preseason outlooks and postseason reviews. Research projects are cooperatively completed within the membership and communications are encouraged between managers and with the public. Expertise is contracted when necessary from outside the membership to conduct studies important to the fishery.

Objectives

The primary objectives of this planning exercise:

1. Define and organize research and investigative priorities in the Yukon River drainage with a 3-5 year timeline;
2. Compare those priorities with the current research program to identify areas needing more research; and
3. Develop and prioritize recommendations for improving the current research program over the next 5 years.

Reasons to Plan

The Yukon River Salmon Agreement, an annex of the Pacific Salmon Treaty, provides for salmon management, conservation and harvest allocation programs and projects. Twenty-one other documents were identified as relevant to JTC research and restoration in the Yukon River (Merritt 2002). The direction of these many mandates to the JTC can be summarized:

- Conserve wild salmon stocks and habitats
- Sustain optimum salmon production
- Collect information on salmon behavior and health
- Recommend escapement objectives and management regimes
- Investigate new ways to evaluate rebuilding
- Determine total return and escapement
- Assess habitat and measures to protect and restore salmon habitat, and
- Collect data on major tributaries for the exploitation of Yukon origin salmon.

This plan will provide a focus and direction for JTC time and monies. Projects can be prioritized, and personnel and equipment allocated to those agreed most important. This plan can be used for projects not necessarily classed as research.

Cooperative research is made more constructive. Communication is encouraged during the planning process, misunderstandings can be rectified and discussion can help to educate. The plan's comprehensive listing of all research needs for the entire basin provides a framework for other plans in the region.

Analytic Hierarchy Process

The JTC initially decided to use the Analytic Hierarchy Process (AHP) to assist the planning group in prioritizing research and other strategic activities and goals by assigning a quantitative measurement to decisions. This process has been successfully used by corporations and governments to develop strategic plans and was originally developed for the Strategic Arms Reduction Talks between the US and the Soviet Union.

Decision Making

Modern research on decision-making suggests humans tend to use feelings and gut responses when making decisions to satisfy our needs and desires. Little logic is used from the intuitive side of the brain. To assign a word or number to priorities helps humans think logically about their decisions in the analytical side of the brain. Comparing options helps the process too. AHP is a tool for facilitating decision-making by structuring a problem into levels to create a hierarchy (Saaty, 2001). In a hierarchy, complex systems broken into their smaller components help make planning more manageable.

Hierarchy Levels

The hierarchy approach to planning allows for an orderly division of plan segments (for example, goals, objectives or issues), which can be separated individually from the whole plan for discussions, review and comparative ratings. AHP helps people organize their thoughts following a consistent and standard procedure to make more effective decisions, and offers participants a method by which to scale judgments of preference or importance in numerical, verbal or graphical form. Since the plan is an ordered hierarchy, individual goals can be viewed separately, and objectives, or issues, under each goal can be viewed as a prioritized list (Merritt and Skilbred, 2002).

Scoring

The process the JTC used integrated technical and social values by assigning a grade to each plan element using a 1-9 point system, 9 is extremely important and 1 is least important. These grades helped to quantify each individual's decision. When elements are compared to similar elements, each person can weigh their importance and place a numerical value to the element. Individuals

have the opportunity to prioritize each of the plan elements for themselves using this ranking or grading system. Assigning numerical values to decisions quantifies the planning process. Values are tallied, and the geometric mean entered into specialized software. The software uses ratio mathematics to order the elements. This ordering can be used to see a prioritized list of plan elements (Appendix A).

PLAN DEVELOPMENT

Initial Plan

Dr. Peggy Merritt was contracted to facilitate the planning process and write a report (Merritt 2002 *In Draft*). The first planning meeting occurred in Anchorage on February 21, 2002 to initiate the development of a strategic plan for salmon research in the Yukon River drainage. The plan was further developed during two sessions occurring on April 15-17 in Fairbanks, Alaska and May 15-17, 2002, in Whitehorse, Yukon Territory. With Dr. Merritt's direction, the JTC used the Analytical Hierarchy Process related Expert Choice software to develop the strategic plan. To prioritize current issues and possible future projects, the committee broke into groups based on interest and/or expertise in the following areas: escapements, harvest management, stewardship, habitat, management/research, and ecosystem research. A report describing the planning process and the results of the initial planning exercise for the JTC was prepared in September 2002 (Merritt 2002 *in draft* and Merritt 2002).

Dr. Merritt's workshops and subsequent report on a draft plan provided a framework from which to continue the planning process. A JTC work session in Whitehorse during the week of October 28, 2002 identified numerous research themes and needs. After reviewing the draft plan, the JTC reached consensus to do additional work before approval as a final document. Specifically, while the content of the draft plan was valuable and comprehensive, overlap and repetition seemed to contribute to poor prioritization. Over the course of all the JTC planning meetings, a glossary had been compiled to define key terms used within the plan; this now appears in the appendix (Appendix B).

Current Plan

The JTC formed an ad hoc subcommittee tasked to improve the organization of the plan, while maintaining its original content. The planning subcommittee was composed of representatives from Department of Fisheries and Oceans Canada (DFO), Alaska Department of Fish and Game (ADF&G), US Fish and Wildlife Service (USFWS), Tanana Chiefs Conference (TCC), Association of Village Council Presidents (AVCP). Yukon River Drainage Fisheries Association (YRDFA), and US Geological Survey-Biological Research Division (USGS-BRD). The subcommittee combined two of the original goals, leaving four goals: 1) fisheries management, 2) habitat, 3) public support and participation, and 4) ecology and salmon biology. Within each

goal, objectives and issues were generalized and referenced from the original plan. The subcommittee completed its work and a new draft plan structure was distributed to all JTC members for review February 2003.

The final goals, objectives, and issues were re-scored (Appendix A). The JTC and the subcommittee avoided concerns from the prior draft plan. For example, in the early planning effort some participants clearly changed their scores only to reach the consensus they were instructed to attain. Similarly, some participants may not have understood the ground rules for scoring, and group members seemed to use the scale differently. Alternatives for these procedures were addressed by not insisting on consensus, but full discussion was encouraged to understand divergent opinions. Participant use of the prioritization scale was reiterated. The facilitator explained a project currently operational implied no reason to not rank it highly. All participants were instructed to prioritize the plan elements in their own minds, to assign less importance to some elements than others.

The analysis conducted by the subcommittee resulted in formulating strategies for all the objectives in the plan (Table 1). The strategies delineate information needed to complete the JTC mission and to assist the member organizations to prioritize future projects and related funding. Some of the objectives required several strategies and other objectives required only one major strategy. The objectives listed under goal 4 will still need development by the JTC at large and by experts in the fields of salmon biology and ecology.

The sub-committee consolidated the initial plan into a streamlined version. All elements of the initial plan were included in this new version. Sub-committee members prioritized these rewritten goals, objectives and issues of the newly revised plan and listed the projects under relevant issues (Table 1). Individual projects were placed under appropriate issues. These projects were designated as past (P), ongoing (O) or scheduled to sunset (S) and the species of major interest were identified. Species numerical codes include the following: 1 = Chinook salmon, 2 = summer chum salmon, 3 = fall chum salmon, and 4 = coho salmon. The individual projects were placed under appropriate issues in Appendix C Table 1, which includes the project number, title, responsible agency, and projects that fulfill treaty obligations highlighted in bold. Each project's objectives were used to guide project placement within the plan. By agreement, an individual project could not appear more than three times. Injecting these projects into the plan helped us to see what information already exists under each issue (Appendix C Table 2). The strategies were devised to discover missing information.

The mission statement was not changed by the JTC plan subcommittee, as originally stated: "Consistent with the Yukon River Salmon Agreement and relevant policies, this plan will provide guidance for the management, protection, restoration, and sustainable use of Yukon River drainage salmon stocks and their habitats in a healthy ecosystem context through cooperative and collaborative application of traditional and local knowledge and scientific research."

DISCUSSION

The planning exercise itself contributes to identifying study goals and information gaps. Analysis of the gaps provides an aid or tool to align project needs and options. The gap analysis tells us where we are and information and projects still needed to fulfill the goals: for fisheries management, to assess salmon habitat, to develop stewardship, and to study salmon biology and ecology.

Goal One: Assess and achieve fishery management objectives

The first objective for this goal is to monitor or project escapements by conservation management unit (CMU). Escapements and abundances will need to be estimated or indexed, and the stock composition and biological composition (e.g. age, size, sex composition) of those escapements will need to be estimated. Escapement estimates will help determine how many salmon are needed to ensure sustainability of the resource. The composition can be assessed biologically or by other means, such as geographical distribution.

Inseason assessment of abundance greatly improves the ability of managers to control harvest times to meet management objectives, such as achieving escapement goals and desired passage to the Canadian border. Characteristics of run timing, age composition and stock identification estimation will help managers assess inseason abundance. In the JTC Strategic Plan, abundance includes the run for the whole drainage including the Porcupine, Tanana and Koyukuk Rivers.

Management objectives need to be established by determining escapement goals and or reference points by CMU. CMUs will probably be defined and identified by doing specific work, and may change in time as techniques are refined. First step is to conduct a JTC Workshop to define CMUs based on current information and units we actively manage for today, and design projects to fill in gaps where information is lacking. This work will help in the future to refine the units. Harvest strategies need to be established or improved and rebuilding plans need to be established.

Management and research capabilities need to be enhanced by improving run and escapement assessment capability. Characteristics of stock composition and run timing can change whole management strategies; they can be used in run projection models, and are important for feasibility assessments. Perhaps new technologies, methods and models will help to improve this capability. Harvest methods need to be investigated to determine the best methods and the forecasting ability of managers needs to be improved.

The challenge of the Yukon River is designing harvest strategies through a gauntlet of fisheries. Harvest needs to be monitored by CMU to aid managers, and the harvest composition needs to be estimated. Eventually the long-term goal is responsible self-reporting of individual harvests.

Drainagewide communications are very good, but these avenues of communications need to be maintained and improved. Coordinating management plans may assist managers to maintain and improve management consultations.

Precautionary management should be defined, investigated and assessed against current management practices. Limitations of management tools need to be assessed. Managers should incorporate uncertainty into decision-making in a consistent and/or quantifiable manner. This issue, appropriate precaution, is an overarching goal for everything in managing the fisheries.

Goal Two: Assess, conserve and restore salmon habitats

Habitats are important for the health of all salmon runs. The Yukon River basin's generally pristine state is what separates this area from other regions where habitats have been lost or negatively affected. Primary in this goal is to identify, characterize and catalog salmon habitats. Important features of habitat need to be identified. Habitat assessment protocols need development. 'Boundaries of use over time' needs determination. And, researchers should develop models of habitat suitability and use.

To minimize future impacts to habitat, this plan suggests identification of activities with potential to impact habitat. Opportunities to develop more effective regulations or administrative arrangements should be identified and promoted. Decisions made during planning processes have impact on habitats. Perhaps proactive participation in planning can have the greatest success on protecting and restoring habitats for the longest time and for the least amount of money. Legislation and regulations with the potential to affect habitat should be assessed. It was suggested the JTC could keep an inventory of planning processes in the JTC report.

Thirdly, the plan suggests that to identify and implement restoration opportunities is important for salmon habitat assessment, conservation and restoration. Negatively affected habitats should be identified. Restoration plans and techniques need to be developed, implemented and evaluated. The JTC may encourage partnerships between local communities and recognized expertise to develop restoration techniques and evaluate their success.

Goal Three: Build and maintain public support of, and meaningful participation in, salmon resource management

Goal 3 has as its primary objective to develop mutual understanding between agencies and the public. The JTC should develop an inclusive communication strategy. Some organizations (First Nations, Tribes and non-government agencies) have valuable traditional and local ecological knowledge (TEK) to share with the public. Protocols should be followed when documenting and using traditional and local knowledge (Alaska Department of Fish and Game 2003; Huntington 1998; Miraglia, R. A. 1998; National Science Foundation). To build support the public needs to be educated on agency missions and mandates.

The capabilities of communities should be used to develop meaningful participation in salmon resource development. Often, to use local talent is the most economically feasible, because locals have extensive knowledge about a specific segment of the river. Community capabilities should be used once identified. Needs of the communities should be identified and the capacity to address them increased wherever possible. As defined in the JTC Glossary, 'community' can be defined geographically, as urban or rural, by industry or by other criteria. By using a broad view, we can discover how each community can support different programs. Professionals, consultants, politicians, and organizations interested in the resource (for example, tourist companies and mayors) are also considered 'communities' and should not be left out.

This plan calls for the JTC to encourage stewardship of the resource by educating industries with impact potential. Stewardship can be encouraged in land and water use planning. The JTC should recognize and promote responsible use of the resource.

Public values of the salmon resource should be promoted. Documenting cultural values of salmon resources by community and educating the public are two ideas to accomplish this promotion. The JTC needs to identify opportunities to increase the values of salmon in different cultures. Some strategies for increasing values are salmon viewing, salmon leather articles and best handling practices.

'Responsible use' is culturally defined. Each culture will need to define what it considers responsible use. If conflicts between cultures exist, the definitions can be discussed and negotiated as needed to preserve the integrity of the salmon.

Goal Four: Improve understanding of salmon biology and ecology

The primary objective under this goal is to investigate relationships between salmon and their physical environment. The influence of environment on distribution and productivity of salmon and the influence of salmon on the environment need to be assessed. For example, ecological and hydrological studies on the Fishing Branch and other areas with special problems need to be conducted. Contaminant dynamics need to be described. The JTC probably won't fully address contaminants, because contamination in the Yukon River basin is minimal compared to other areas of North America. Although existing agencies and organizations have studied contaminants in the river, the JTC has not initiated its own investigations.

The second objective is to investigate relationships between salmon and other organisms. The impacts of disease and parasites need to be evaluated. The JTC needs to assess and monitor ecosystem structure and health. The effects of competition need to be investigated and predator-prey relationships determined.

Plan Usage

This plan will guide the JTC, and the Yukon River Panel, on key research and conservation needs for the entire Yukon River basin. We will use the plan in each agency internally and to communicate with an international public. This plan can aid proponents and funding agents to identify basinwide priorities. Proponents applying for funding can use the plan to identify main concerns for projects and research. Likewise, funding agents can use the plan to make their call for proposals more specific and to prioritize submitted proposals.

This plan defines and organizes research and investigative priorities in the Yukon River drainage. This plan lists the goals, objectives and issues in order of priority. Goal 1, *Assess and achieve fishery management objectives,* is a higher priority than goal 2, *Assess, conserve and restore salmon habitats.* Goal 4, *Improve understanding of salmon biology and ecology*, has the lowest priority. Objectives under each of the goals are prioritized. For example, Goal 1, Objective 1, *Monitor or project escapements by CMU*, is a higher priority than Goal 1, Objective 2, *Assess abundance inseason.* Objective 7, *Investigate and implement precautionary management*, has the lowest priority for that goal. Issues under each objective are prioritized, but strategies for addressing each issue are not prioritized.

The JTC Strategic Plan, although written for a specific timeline, is dynamic or evergreen. Evergreen means it can be adjusted as needs as users and resources change; an evolving document to be continually revised as projects come and go, and projects or completed tasks answer questions outlined in the plan. By keeping the strategies updated and timely, the plan will remain functional.

WHAT'S NEXT

The current draft plan lists strategies for research and program goals throughout the drainage to develop and prioritize recommendations for improving the current research program over the next 5 years. Those priorities were compared with current research programs to identify areas needing more research. Overall, the JTC successfully prioritized multi-national and multi-agency research projects to fill gaps identified in all four goals. Additional tasks remain:

1. A series of workshops are needed to plan a long-term escapement-monitoring program to ascertain and prioritize projects to monitor escapement throughout the basin in the mainstem and in the various tributaries. This comprehensive program will evaluate all current projects for relevance.
2. Other planning initiatives are developing a database to make recommendations about information needed to monitor size and age in both escapements and harvests. A review of age-composition data will identify gaps in existing data to help direct future collection programs.

3. Additional planning may come from assessment of gear selectivity and effects of that selectivity, still to be completed for the Panel.
4. A separate subcommittee may look at different timing of stock groupings, and genetic separation with the execution of genetics work. This subcommittee can use the data collected from radio tagging projects to validate results.
5. The JTC should promote construction and maintenance of a criteria-based data grid to prioritize project funding – a benefit cost analysis included.
6. The JTC should lead a workshop of invited experts to identify the ecological problems associated with productivity and to identify potential a study area(s).

A timeline for implementing the plan suggests the JTC finalize the plan in 2004 and initiate its use this coming fall of 2005. This plan will be available to the Yukon River Panel for the October 2005 Restoration and Enhancement Fund conceptual proposals review.

Ultimately, we want as our legacy a healthy ecosystem, and vibrant management scheme designed to sustain the salmon resource for which both countries share responsibility. To this end, we want to think about the future as the goals outlined in this JTC Strategic Plan.

Timeline for Implementation

2004	2005	2006	2007	2008
Finalize plan, publicize and present to the public	Initiate use of this plan and begin program development	Use plan to assist in prioritization of projects and funding	Use plan to assist in prioritization of projects and funding	Assess relevance of plan elements and update plan as necessary

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LIST OF ACRONYMS

ADFG Alaska Department of Fish and Game

AVCP Association of Village Council Presidents, Alaska

BSFA Bering Sea Fishermen's Association, Alaska

BLM Bureau of Land Management, United States

BOF Board of Fisheries, Alaska

DDRRC Dawson District Renewable Resource Council

DFN Dawson First Nation (old term, not to be used, now Tr'ondëk Hwëch'in First Nation)

DFO Department of Fisheries and Oceans, Canada

DIAND Dept. Indian Affairs and Northern Developement

FIS Fisheries Information Service

FISS Fisheries Information Summary System

FDD Fish Distribution Database

HCSP Habitat Conservation and Stewardship Propram

JTC Joint Technical Committee

LSCFN/YCS Little Salmon/Carmacks First Nation/Yukon Conservation Society

NND First Nation of Na-Cho Nyäk Dun

NMFS National Marine Fisheries Service, United States

NPS National Park Service, United States

NTC Nulato Tribal Council

OSM Office of Subsistence Management

RRDG Ross River Dena Council

LIST OF ACRONYMS (Continued)

R&E Restoration and Enhancement Fund

R&M Research and Management Fund

TCC Tanana Chiefs Conference, Alaska

TTC Teslin Tlingit Council

THFN Tr'ondëk Hwëch'in First Nation

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

VGFN Vuntut Gwich'in First Nation

WCC/NRI Whitehorse Correctional Centre/Northern Research Institute

WRFN White River First Nation

YRCFA Yukon River Commercial Fishing Association, Canada

YRDFA Yukon River Drainage Fisheries Association, Alaska

YSC Yukon Salmon Committee, Canada

Table 1. Strategies to achieve goals and objectives of JTC plan

1. **Assess and achieve fishery management objectives**

1.1 Monitor or project escapements by Conservation Management Unit

1.1.1 Estimate or index escapements

Strategies:

A. Reassess needs using results from genetic stock ID and radio tagging projects

B. Identify CMU by species

C. Complete an assessment of where escapement monitoring is necessary and how often a system or tributary needs to be monitored

D. Evaluate cost and utility of various methods of counting escapement such as aerial surveys, sonar, weirs, towers, video, etc.

E. Assess the number of projects by species with absolute counts, geographic distribution, strengths, and weaknesses

1.1.2 Estimate the stock biological or other composition of escapements

Strategies:

A. Link to planning meeting for 1.1.1

B. Evaluate sampling methods to assure unbiased sampling

C. Develop sampling protocols

1.2 Assess abundance inseason

1.2.1 Estimate or index abundance

Strategies:

A. Evaluate current program and develop plan for long-term abundance monitoring

B. Develop an evaluation framework to assess the cost and utility of various methods of determining relative and absolute abundance

C. Evaluate sonar and mark-recapture projects to determine how well they correlate with other measures of abundance and look for ways to make them more reliable

D. Conduct a workshop to discuss these points

1.2.2 Estimate CMU composition of abundance

Strategies:

A. Define an on the grounds program and design an intermediate level of evaluation and planning

B. Define and identify CMU (See 1.3.2)

C. Evaluate current programs by area to optimize stock composition data collection

D. Assess escapement to major tributaries or sub basins by monitoring mainstem abundance and stock composition

E. Place escapement projects on selected tributaries to assure good geographical distribution and ground truth mainstem projects

Table 1. (Page 2 of 11)

1.2.3 Estimate characteristics of run timing

Strategy:

A. Assess absolute versus index or relevant abundance

1.3 Establish management objectives

1.3.1 Establish escapement goals and/or reference points by CMU

Strategies:

A. Explore and compare US sustainable fisheries escapement policy and emerging Canadian Wild Salmon Policy
B. Review all escapement goals for consistency with applicable policies as part of the overall escapement plan
C. Set goals where feasible, monitor where goals are established. Goals need to be set through a consistent process – may use stock recruitment in combination with habitat parameters
D. Identify information gaps that hinder analysis of appropriate goals
E. Collect and catalog different methodologies for setting goals (put literature together and distribute)
F. Devise a practical guide to ascertain a precautionary approach

1.3.2 Define CMU

Strategies:

A. Review other definitions and uses of CMUs –for example, BC and Pacific NW
B. Combine genetic baseline with management reality
C. Identify data needed to establish CMUs and ensure they are collected
D. Find examples of how CMUs are established

1.3.3 Identify CMUs {conditioned on definition}

Strategies:

A. Review current management strategies and recommendations for improvement. Collect literature
B. Identify data shortfalls
C. Bring all appropriate data, geneticists, and managers together to identify

1.3.4 Establish or improve harvest strategies (mesh size, schedules)

Strategies:

D. Define harvest strategies from CMUs
E. Complete mesh assignment from Panel
F. Identify chronic management problems that need strategies
G. Review and make recommendations to improve database so that management by CMU can be monitored effectively
H. Compile and evaluate age composition data and stock timing through fisheries

Table 1. (Page 3 of 11)

1.3.5 Establish rebuilding plans as necessary

Strategy: Reiterate rebuilding schedules and needs identified in treaty including rebuilding of mainstem Yukon Chinook and chum salmon and Fishing Branch chum salmon

1.4 Improve management and research capability

1.4.1 Improve run assessment capability

Strategies:

A. Work toward inseason subsistence harvest monitoring
B. Develop inseason stock ID
C. Evaluate cost effectiveness and accuracy of various assessment methods in season.
D. Evaluate customary trade between rural residents

1.4.2 Improve escapement assessment capability

Strategies:

A. Document existing and emerging techniques
B. Assess existing projects and identify improvements required to bring them up to a common standard.
C. Assess sampling difficulties
D. Combine techniques where necessary

1.4.3 Investigate new technology, methods and models

Strategies:

A. Evaluate Didson sonar
B. Develop less intrusive sampling methods
C. Evaluate effects of crew fatigue on data quality
D. Investigate digital video at towers and weirs, and develop ways to measure fish from video
E. Develop ways to improve efficiency such as using less personnel time, reducing fatigue, reducing the handling of fish, and reducing impediments to migration
F. Develop and make available to researchers a documentation of new and emerging technologies

1.4.4 Investigate harvesting methods

Strategies:

A. Investigate and evaluate selectivity of current harvesting methods
B. Develop options for reducing or eliminating harvest of certain components of the run as required
C. Document gear used in various fisheries annually

Table 1. (Page 4 of 11)

1.4.5 Improve forecasting ability

Strategies:

A. Investigate relationship between high seas catches and returns to river
B. Conduct high seas juvenile studies
C. Develop inriver juvenile abundance indices

1.5 Monitor harvest by CMU

1.5.1 Estimate harvest by fishery in season

Strategy:

A. Estimate inseason subsistence catch

1.5.2 Estimate the stock biological or composition of harvest

Strategies:

A. Improve inseason genetic stock ID
B. Build database to analyze genetic/ASL data and to correlate with escapement
C. Develop strategy to determine what harvest to sample

1.6 Maintain and improve harvest management consultation

1.6.1 Improve drainagewide consultation

Strategies:

A. Continue to promote participation in drainagewide conference calls and exchanges
B. Encourage public attendance at Panel meetings
C. Encourage greater knowledge and understanding among public of fishery and habitat (see 2.2.2) regulations and regulatory processes

1.6.2 Coordinate management plans

Strategies:

A. Continue coordinating management plans
B. Identify early specific issues to coordinate for fall JTC meeting

1.7 Investigate and implement precautionary management

1.7.1 Assess limitations of management tools

Strategies:

A. Compare success at meeting management targets with inseason management action to see if changes need to be made
B. Complete an assessment of each major run assessment tool
C. Compare actual outputs/results with goals

1.7.2 Incorporate uncertainty into decision making

Strategies:

A. Collect available literature on precautionary management
B. Develop definitions

Table 1. (Page 5 of 11)

C. Develop criteria for evaluation of costs and benefits for precautionary management
D. Review uncertainty analysis by specialists
E. Conduct a risk analysis associated with major run assessment projects; risk of not achieving escapement goals and risk of not achieving harvest goals

1.7.3 Define precautionary approach

Strategies:

A. Discuss what degree of intuition should be used in times of uncertainty
B. Review precautionary fisheries management, familiarize the JTC

2 Assess, conserve and restore salmon habitats

2.1 Identify, characterize and catalog salmon habitats

2.1.1 Identify important features of habitat

Strategies:

A. Update Fisheries Information Summary System and Fish Distribution Database
B. Update the Alaska Anadromous Waters Catalog
C. Continue inventory of salmon streams
D. Research physical and biological characteristics of spawning, summer rearing, and over wintering of salmon habitats of salmon
E. Identify research and catalog needs to characterize smaller streams and increase the overall number of research oriented projects
F. Encourage research scientists to participate in the assessment of habitat

2.1.2 Develop habitat assessment protocols

Strategies:

A. Develop protocols to assess habitats
B. Set up protocols according to habitat characteristics
C. Conduct a workshop with knowledgeable people to determine what is needed for assessing habitat

2.1.3 Define boundaries of use over time

Strategies:

A. Suggest definition be geographic use and distribution at all life stages and include past utilization
B. Track changes over time from changing environments such as climate changes, glacial retreat, evapo-transpiration rates, and changes in stream flow
C. Explore physical parameters of the environment and how they relate to salmon production and changes over time

Table 1. (Page 6 of 11)

2.1.4 Develop models of habitat suitability and use

Strategies:

A. Modify a habitat suitability index model for Yukon River Chinook chum, coho and develop model of use

B. Fill gaps with additional primary or applied research or other existing information

2.2 Minimize future impacts to habitat

2.2.1 Identify activities with potential to impact habitat

Strategies

A. Identify emerging development issues with impact potential (where future oil, railway, pipeline, etc, lines will be) so data can be collected in advance

B. Develop a list of permitting and licensing systems

C. Encourage and participate in interagency meetings to explain future development plans

2.2.2 Identify and promote opportunities to develop more legislation, regulations, and other administrative arrangements

Strategies

A. From 1.6.1 C, communicate about habitat regulatory process on each side of the border

B. Use local and traditional knowledge and expertise to encourage more effective environmental guideline and controls (use Community Stewards on Canadian side)

2.2.3 Identify and participate in available planning processes

Strategies

A. Inventory land/water-planning processes on an ongoing basis and include agency involvement in the annual JTC Report

B. Include DNR Habitat staff in JTC

2.2.4 Assess legislation and regulations with the potential to affect habitat

Strategies:

A. Provide input into environmental regulatory processes at all levels

B. Determine if the regulatory review framework addresses potential impacts, such as motor boat use and the affect of sport fishery on stream banks

Table 1. (Page 7 of 11)

2.3 Identify and implement restoration opportunities

2.3.1 Identify negatively affected habitats

Strategies

A. Develop protocols for identifying; reporting and cataloging negatively affected habitats
B. Develop and maintain information management systems about negatively affected habitat and changes in those habitats over time
C. Encourage development of natural process-based reporting and management regimes

2.3.2 Develop, implement and evaluate restoration plans

Strategies

A. Encourage participation in development of restoration plans that include assessment, intervention and evaluation, from the project level to the watershed level
B. Develop a coherent framework for creating watershed salmon restoration and enhancement plans and prioritize funding of projects that fit within those plans and have community support

2.3.3 Develop and evaluate restoration techniques

Strategies:

A. Encourage partnerships between local communities and recognized expertise to identify opportunities for development of restoration techniques and evaluate the success or the techniques
B. Encourage development of restoration techniques appropriate to the specific circumstances and bring in appropriate fields of expertise to assist in their development
C. Develop tools as necessary. Recognize regional techniques may vary

3 Build and maintain public support of, and meaningful participation in, salmon resource management

3.1 Develop mutual understandings between agencies and the public

3.1.1 Promote understanding and participation in the development of management plans, methods and strategies

Strategies:

A. Develop a consistent consultation framework and schedule
B. Rotate through the communities
C. Encourage broader participation in weekly inseason teleconferences
D. Encourage development and participation of exchanges
E. Encourage public participation in Panel meetings
F. Communicate annual Panel schedule

Table 1. (Page 8 of 11)

3.1.2 Develop inclusive communication strategy

Strategies:

A. Develop a positive, non-defensive strategy for JTC to disseminate information on subjects of broad public interest. JTC Report can list various websites
B. Encourage proactive communication and positive stories in newspaper articles and websites
C. Inventory of available email distribution lists by subject so people can sign up if they want and put it on the website and in the JTC Report
D. Formalize distribution lists

3.1.3 Document and utilize traditional and local knowledge following protocols

Strategies:

A. Review all collected traditional and local knowledge, and review how it is used and investigate how it should be used
B. Panel should specify how TEK collected from R&E funded projects would be used
C. Panel needs to develop protocol for TEK data collection, being mindful of the spiritual side of salmon usage
D. Be mindful of the need to consider and use TEK to the extent possible

3.1.4 Educate the public on agency missions and mandates

Strategies:

A. Demonstrate missions and mandates by a positive approach and good products
B. Develop public support and advocacy

3.2 Build and maintain community capacity

3.2.1 Utilize capabilities of communities

Strategies:

A. Promote programs that utilize capabilities, and work to enhance those capabilities (R&E projects, harvest monitoring and sampling, community stewardship, technician training courses)
B. Utilize local people and other community resources in existing projects in the area
C. Use graduates from college course certification program for technicians

3.2.2 Identify capabilities and needs of communities

Strategies:

A. Encourage proposals to R&E fund from communities
B. Technical contacts should maintain communications with communities to help assess capabilities and needs

Table 1. (Page 9 of 11)

3.2.3 Increase capabilities of communities

Strategies:

A. Technical Contacts can assist to assess needs and observe patterns in communities
B. Technical Contacts can work with training opportunities for example, initiatives, curricula, workshops, and assist to make them available to communities
C. Meet with communities to discuss needs and to increase capacity

3.3 Encourage stewardship of the resource

3.3.1 Educate industries with impact potential

Strategies:

A. Develop Fact Sheets – Best Management Practices, Best Practices Codes, or other guidelines or documents
B. Participate at conventions, annual meetings, trade shows and other meetings
C. Identify opportunities to do the above
D. Examine selectivity of various fisheries/methods

3.3.2 Participate in planning initiatives

Strategy:

Encourage inclusion of stewardship in land and water use planning

3.3.3 Recognize and promote responsible use of the resource

Strategies:

A. Develop recognition awards from the panel
B. Consider impacts of research projects on fish and promote use of less intrusive sampling and handling techniques

3.4 Promote public values of the salmon resource

3.4.1 Educate public on the values of salmon and salmon habitat

Strategies:

A. Promote school programs for all grade levels, college courses and other opportunities to present information
B. Promote interpretive signage
C. Promote viewing programs
D. Increase interest in JTC work particularly from Canadian communities

3.4.2 Document cultural values of salmon resources by community

Strategy:

Encourage initiatives to document cultural values of salmon resources

Table 1. (Page 10 of 11)

3.4.3 Identify opportunities to increase the values of salmon

Strategies:

A. Promote salmon viewing
B. Develop to sell, salmon leather articles

4 Improve understanding of salmon biology and ecology

4.1 Investigate relationships between salmon and their physical environment

4.1.1 Assess the influence of environment on productivity

Strategies:

A. Monitor temperature at strategic locations throughout the drainage (data loggers at project sites)
B. Compile existing historical temperature records and hydrographs, and analyze trends over time
C. Conduct technical workshop about the influence of environment on productivity
D. Look at small isolated areas or special problem areas
E. Encourage continuation of projects, and sources of funding like BASIS
F. Summarize other research programs at JTC meeting
G. Explore nutrient dynamics
H. Use relationships between physical and environmental characteristics and salmon productivity to evaluate escapement goals
I. Look at other measures of salmon production, for example the accumulation of marine-derived nutrients in tree cores and sediments
J. Investigate elements of the environment that control productivity, maybe conduct a workshop and set up some study areas
K. Determine the effects of beaver activity on stream and channel form, and on the upstream migration of juvenile and adult salmon
L. Determine methods of identifying high quality ground water discharges draining to salmon rearing and spawning streams
M. Evaluate the success of Fishway rearing by determining adult survival and smolt production
N. Search funding sources to gather experts together to help design a Fishing Branch ecological study

4.1.2 Assess the influence of salmon on environment

Strategies:

A. Determine the extent of marine derived nutrient (MDN) transfer to specific habitats
B. Determine the effects of MDN transfer to specific habitats
C. Determine the effect of spawning salmon on stream morphology

4.1.3 Describe contaminant dynamics

Strategies:

A. Assess the levels of contaminants in Yukon River salmon
B. Evaluate the affects of contaminants on Yukon River salmon

Table 1. (Page 11 of 11)

C. Identify the sources of contaminants in Yukon River salmon
D. Identify methods to mitigate contaminants in Yukon River salmon

4.2 Investigate relationships between salmon and other organisms

4.2.1 Evaluate impacts of disease and parasites

Strategy:

A. Continue *Ichthyophonus* study
B. Identify other potential hosts, pathogens, or curiosities

4.2.2 Assess and monitor ecosystem structure and health

Strategies:

A. Compile existing biological data and traditional/local knowledge, including vegetation spatial data for salmon habitat utilization areas
B. Compile existing historical water level records and analyze trends over time
C. Monitor stream flow volumes throughout the drainage
D. Identify and map surficial geology of drainage areas for the purposes of identifying hydrogeological trends
E. Assess groundwater storage potential and hydraulic conductivity (discharge rate) of drainage basin geomorphology for salmon rearing and spawning streams

4.2.3 Investigate effects of competition

Strategies:

A. Determine the relationships between instream density and individual growth for juvenile Chinook salmon
B. Determine the relationships between artificially propagated and wild juvenile Chinook salmon
C. Determine the effects of juvenile Chinook salmon densities on food organisms within streams
D. Determine early life feeding strategies of juvenile chum salmon

4.2.4 Determine predator-prey relationships

Strategies:

A Determine the extent and intensity of predation by fish, birds and mammals on juvenile salmon
B. Investigate the annual and seasonal importance of juvenile salmon for predators. Potential avenues of investigation include stable isotope and fatty acid analysis
C. Investigate predator population function and proximal responses to variations in salmon prey abundance
D. Investigate the occurrence and magnitude of juvenile salmon predation on other salmon species (for example, juvenile Chinook and coho salmon predation on emerging chum salmon fry)
E. Determine the effect of channel structures on the success of predation on juvenile and adult salmon

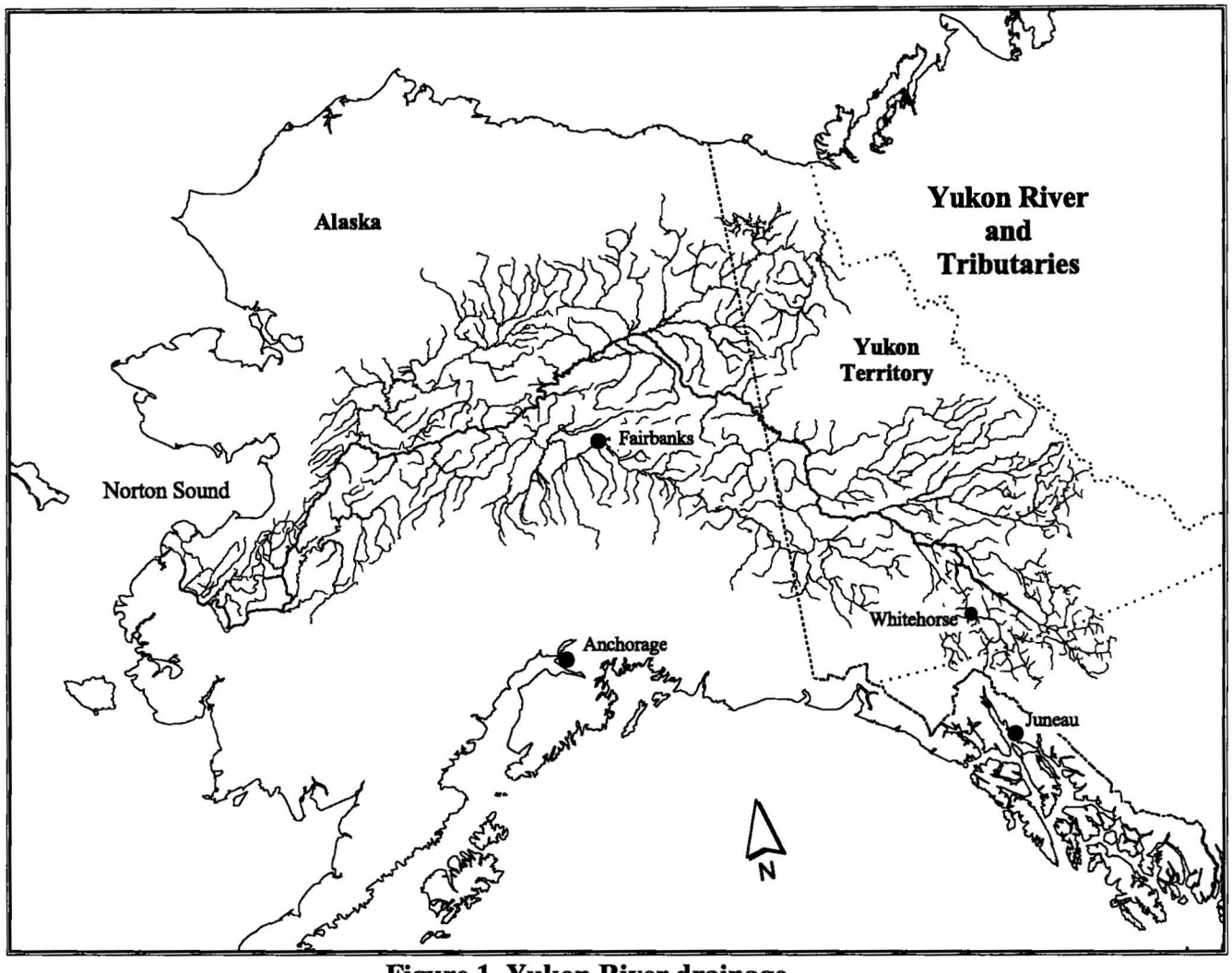

Figure 1. Yukon River drainage

Appendix A Table 1. Ranked priorities of goals, objectives and issues in the JTC Plan (Geometric means are in bold)

1. **Assess and achieve fishery management objectives 8.14**
   - 1.1 Monitor or project escapements by CMU **7.67**
     - 1.1.1 Estimate or index escapements **8.49**
     - 1.1.2 Estimate the stock biological or other composition escapements evaluate rebuilding plans or artificial propagation **6.61**
   - 1.2 Assess abundance inseason **7.66**
     - 1.2.1 Estimate or index abundance **8.47**
     - 1.2.2 Estimate CMU composition of abundance **7.43**
     - 1.2.3 Estimate characteristics of run timing **6.08**
   - 1.3 Establish management objectives **7.61**
     - 1.3.1 Establish escapement goals and/or reference points by CMU **7.84**
     - 1.3.2 Define CMU **7.38**
     - 1.3.3 Identify CMUs {conditioned on definition} **6.93**
     - 1.3.4 Establish or improve harvest strategies (mesh size, schedules) **5.86**
     - 1.3.5 Establish rebuilding plans as necessary (identify depressed CMUs) **5.36**
   - 1.4 Improve management and research capability **6.76**
     - 1.4.1 Improve run assessment capability **8 .09**
     - 1.4.2 Improve escapement assessment capability **7.69**
     - 1.4.3 Investigate new technology, methods and models **6.48**
     - 1.4.4 Investigate harvesting methods **4.85**
     - 1.4.5 Improve forecasting ability **4.54**
   - 1.5 Monitor harvest by CMU **6.58**
     - 1.5.1 Estimate harvest by fishery inseason **7.36**
     - 1.5.2 Estimate the stock biological or other composition of harvest **7.17**
   - 1.6 Maintain and improve harvest management consultation **5.40**
     - 1.6.1 Improve drainagewide consultation **7.32**
     - 1.6.2 Coordinate management plans **6.64**
   - 1.7 Investigate and implement precautionary management **5.32**
     - 1.7.1 Assess limitations of management tools **7.22**
     - 1.7.2 Incorporate uncertainty into decision making **6.54**
     - 1.7.3 Define precautionary approach **5.98**

2 **Assess, conserve and restore salmon habitats 6.63**
   - 2.1 Identify, characterize and catalog salmon habitats **8.47**
     - 2.1.1 Identify important features of habitat **7. 23**
     - 2.1.2 Develop habitat assessment protocols **6.92**
     - 2.1.3 Define boundaries of use over time **6.70**
     - 2.1.4 Develop models of habitat suitability and use **5.20**
   - 2.2 Minimize future impacts to habitat **7.23**
     - 2.2.1 Identify activities with potential to impact habitat **8.04**
     - 2.2.2 Identify and promote opportunities to develop more effective regulations **6.83**
     - 2.2.3 Identify and participate in available planning processes **6.73**
     - 2.3.4 Assess regulations with the potential to affect habitat **6.21**

Appendix A Table 1 (Page 2 of 2)

2.3 Identify and implement restoration opportunities **5.93**
- 2.3.1 Identify negatively affected habitats **8.07**
- 2.3.2 Develop, implement and evaluate restoration plans **6.73**
- 2.3.3 Develop and evaluate restoration techniques **6.42**

3 Build and maintain public support of, and meaningful participation in, salmon resource management 6.09

3.1 Develop mutual understandings between agencies and the public **8.34**
- 3.1.1 Promote understanding and participation in the development of management plans, methods and strategies **7.80**
- 3.1.2 Develop inclusive communication strategy **7.65**
- 3.1.3 Document and utilize traditional and local knowledge following protocols **6.65**
- 3.1.4 Educate the public on agency missions and mandates **5.44**

3.2 Build and maintain community capacity **7.04**
- 3.2.1 Utilize capabilities of communities **7.72**
- 3.2.2 Identify capabilities and needs of communities **7.17**
- 3.2.3 Increase capabilities of communities **6.70**

3.3 Encourage stewardship of the resource **6.72**
- 3.3.1 Educate industries with impact potential **7.77**
- 3.3.2 Participate in planning initiatives **6.76**
- 3.3.3 Recognize and promote responsible use of the resource **5.79**

3.4 Promote public values of the salmon resource **5.28**
- 3.4.1 Educate public on the values of salmon and salmon habitat **7.72**
- 3.4.2 Document cultural values of salmon resources by community **7.53**
- 3.4.3 Identify opportunities to increase the values of salmon **5.96**

4 Improve understanding of salmon biology and ecology 5.15

4.1 Investigate relationships between salmon and their physical environment **7.77**
- 4.1.1 Assess the influence of environment on productivity **8.18**
- 4.1.2 Assess the influence of salmon on environment **6.53**
- 4.1.3 Describe contaminant dynamics **4.86**

4.2 Investigate relationships between salmon and other organisms **6.90**
- 4.2.1 Evaluate impacts of disease and parasites **7.58**
- 4.2.2 Assess and monitor ecosystem structure and health **7.33**
- 4.2.3 Investigate effects of competition **4.92**
- 4.2.4 Determine predator-prey relationships **4.49**

(Page 1 of 9)

Appendix B. Glossary of Terms: JTC Yukon River Basinwide Plan

Appropriate

Research plan: "Appropriate" reference points and escapement goals based on spawning stock biomass have a warning zone or threshold that should be based on biological/ecological considerations of sustainability. Beyond threshold, "appropriate" reference points and escapement goals result from harvest strategies to implement management objectives, which can differ by conservation unit/geographic area (CU) and may change over time as more data becomes available, i.e. what is appropriate today may not be appropriate two years from now. Thus, "appropriate" for one CU may be different from "appropriate" for another CU. "Appropriate" should be based on clearly defined management objectives by CU.

Barter

State of Alaska Fish and Game Laws and Regulations: Annotated Sec. 16.05.940 "barter means the exchange or trade of fish or game, or their parts, taken for subsistence uses for other fish or game or their parts; or for other food or for non-edible items other than money if the exchange is of a limited and noncommercial nature."

Federal Register / Vol. 66, No. 133, Sec __ 4 "Barter means the exchange of fish or wildlife or their parts taken for subsistence uses; for other fish, wildlife or their parts; or, for other food or for nonedible items other than money, if the exchange is of a limited and noncommercial nature."

Boundaries of use

Research Plan: Available habitat can differ in some years from habitat actually being used, therefore it is misleading to just define fisheries habitat as that which is being used over the course of a short time frame. There are multiple spatial scales to consider such as basin, sub- basin, reach, micro-habitat. Habitat capacity should be considered and a watershed approach should be taken. There are predictive tools for determining habitat (model of suitability use). Be mindful of upstream and upland or off channel habitat, and place emphasis on models of use, not extent of use. Consider the importance of linkages or pathways between habitat types. "Boundaries of use' includes highways or pipelines. Be aware of the potential impacts from future development.

Sustainable Salmon Fisheries Policy for the State of Alaska: "Salmon habitat in freshwater should be protected on a watershed basis, including appropriate management of riparian zones". Essential habitat in the policy "includes spawning and incubation areas, freshwater rearing areas, estuarine and near shore rearing areas, offshore rearing areas, and migratory pathways."

Carrying Capacity

Research Plan: "Carrying capacity for a given population is considered to be the limiting size of that population that can be supported by an ecosystem over a period of time and under a given set of environmental conditions." Defined by Warren S. Wooster, School of Marine Affairs, University of Washington, 3707 Brooklyn Ave. N.E., Seattle, WA 98105-6715.

Appendix. Glossary of Terms (Page 2 of 9)

Clinical health of the population
Research plan: survival.

Community
Research Plan: a community is composed of the relationships among persons who consider themselves to be part of that community, be it geographic or interest based.

Community capacity
Research Plan: To build community capacity is to train local residents, and to encourage public involvement in fisheries related work and decision-making, and develop expertise in communities to maintain biodiversity and ecological health. The public is educated on the pros and cons of their actions, e.g., the impacts from throwing batteries in the river, and the importance of water quality. The community is educated on the rationale for management actions. Capacity building means that more local people are involved in all aspects of research, including reasons for initiating research. Mentoring and internships for younger people and offering educational courses are tools used in building community capacity.

Conservation unit or geographic area
Research plan: These aggregates share a common genetic lineage and can be managed effectively as a unit by virtue of their common productivity and, through behavior, common vulnerability to existing fisheries. Even a species could be a conservation unit. However, conservation units need careful consideration – it may not be possible to always manage for conservation units. A conservation unit can be represented as a specific geographic area. The term 'unit' must be defined.

Canada's emerging Wild Salmon Policy: "A conservation unit is defined as a group of one or more local populations that share a common genetic lineage and can be managed effectively as a unit by virtue of their common productivity and vulnerability to existing fisheries. " To be further refined.

Consult
Umbrella Final Agreement between the Government of Canada, the Council for Yukon Indians and the Government of Yukon, 1993: "Consult" or "Consultation" means to provide:

i. to the party to be consulted, notice of a matter to be decided in sufficient form and detail to allow that party to prepare it's views on the matter;
ii. a reasonable period of time in which the party to be consulted may prepare it's views on the matter, and an opportunity to present such views tot he party obliged to consult; and
iii. full and fair consideration by the party obliged to consult of any views presented

Customary trade
State of Alaska Fish and Game Laws and Regulations Annotated Sec. 16.05.940 (8) "customary trade means the limited noncommercial exchange, for minimal amounts of cash, as restricted by the appropriate board, of fish or game resources; the terms of this paragraph do not restrict money sales of furs and furbearers."

Appendix B. Glossary of Terms (Page 3 of 9)

Federal Register / Vol. 66, No. 133, Sec. __. 4: The exchange for cash of fish and wildlife resources regulated in this part, not otherwise prohibited by Federal law or regulation, to support personal and family needs; and does not include the trade, which constitutes a significant commercial enterprise.

Canadian definition: See Subsistence.

Efficacy

Dictionary: power to produce a desired or intended result; how effective you are at achieving what you set out to accomplish.

Enhancement

Research Plan: Uses the Yukon Salmon Agreement definition.

Yukon Salmon Agreement: "Enhancement means expanding a wild salmon stock beyond its natural production level."

Sustainable Salmon Fisheries Policy for the State of Alaska (Alaska 5 AAC 39.222):
"Enhanced salmon stock is a stock of salmon that is undergoing a specific manipulation (such as hatchery augmentation, lake fertilization, to enhance its productivity above the level that would naturally occur."

Escapement range

Research Plan: A range needs to be further defined.

Alaska's Policy for Statewide Salmon Escapement Goals: "The lower and upper limits of the escapement range will be consistent with MSY and will be based on factors such as variability in stock productivity and data uncertainty".

Sustainable Salmon Fisheries Policy for the State of Alaska (Alaska 5 AAC 39.222):
"Escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the stock measured."

Goal

Dictionary: A long time achievement that contributes to the accomplishing of a mission.

Guidance

Research Plan: Guidance includes stewardship, and encompasses research, Traditional Knowledge, and local knowledge.

Habitat

Canadian Fisheries Act S.34(1) "Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes" In Canadian jurisprudence, this may include the immediate riparian zone, non-

Appendix B. Glossary of Terms (Page 4 of 9)

fish bearing tributaries that flow into and carry food to fish bearing streams, and streams that may seasonally carry water and support fish.

Index system

Research Plan: An escapement unit defines an escapement index. An index area is broad, not specific, and data gathered tends to be limited (e.g. one – three counts of salmon in a specific stream reach). Tests for several years are needed to calibrate an index system with actual abundance. Tests for several years are needed to calibrate an index system. Existing indices can be evaluated and refined through validation studies using alternative abundance estimation methods. Which tributaries are accurate representatives of escapements in any system will need to be determined at the sub-basin level.

Instream flow reservation

Research Plan: In the US, a state declares instream flows for fish habitat to be beneficial and appropriates water for that purpose. Thus, aquatic habitat is protected through the reservation of water. Filing for water reservations is a legal process that requires characterization of the aquatic habitat, information on flow requirements of fishes, etc. In the Yukon River Basin in Canada, "minimum flows" retained in a stream for the maintenance of fish or fish habitat may be a requirement of a Water License granted by a Provincial or Territorial government.

Issue

Dictionary: An impediment to overcome, an uncertainty, an information gap, which prevents you from reaching your objective.

Limits of the Yukon River ecosystem

Research Plan: Ecosystem boundaries need to be established, because no one knows the total migratory pathway of Yukon River salmon.

Local Knowledge

Research Plan: Information regarding the distribution, abundance and use of the fisheries resource gained through observation by, or communicated to and retained by, a current or past member of a geographical community.

Management Plan

Research Plan: An informal harvest strategy, which is important to meet treaty obligations and incorporates the following objectives: integrated fisheries management plans (Canada), and ecosystem concepts.

Sustainable Salmon Fisheries Policy for the State of Alaska: Protect wild salmon and its habitat in order to maintain resource productivity. Maintain escapements within ranges necessary to conserve and protect potential salmon production and to maintain normal ecosystem functioning. Harvest salmon in a manner consistent with the degree of uncertainty regarding the status and biology of the resource. Establish and apply an effective

Appendix A Table 1 (Page 2 of 2)

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(Page 1 of 9)

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Research plan: "Appropriate" reference points and escapement goals based on spawning stock biomass have a warning zone or threshold that should be based on biological/ecological considerations of sustainability. Beyond threshold, "appropriate" reference points and escapement goals result from harvest strategies to implement management objectives, which can differ by conservation unit/geographic area (CU) and may change over time as more data becomes available, i.e. what is appropriate today may not be appropriate two years from now. Thus, "appropriate" for one CU may be different from "appropriate" for another CU. "Appropriate" should be based on clearly defined management objectives by CU.

Barter

State of Alaska Fish and Game Laws and Regulations: Annotated Sec. 16.05.940 "barter means the exchange or trade of fish or game, or their parts, taken for subsistence uses for other fish or game or their parts; or for other food or for non-edible items other than money if the exchange is of a limited and noncommercial nature."

Federal Register / Vol. 66, No. 133, Sec __ 4 "Barter means the exchange of fish or wildlife or their parts taken for subsistence uses; for other fish, wildlife or their parts; or, for other food or for nonedible items other than money, if the exchange is of a limited and noncommercial nature."

Boundaries of use

Research Plan: Available habitat can differ in some years from habitat actually being used, therefore it is misleading to just define fisheries habitat as that which is being used over the course of a short time frame. There are multiple spatial scales to consider such as basin, sub- basin, reach, micro-habitat. Habitat capacity should be considered and a watershed approach should be taken. There are predictive tools for determining habitat (model of suitability use). Be mindful of upstream and upland or off channel habitat, and place emphasis on models of use, not extent of use. Consider the importance of linkages or pathways between habitat types. "Boundaries of use' includes highways or pipelines. Be aware of the potential impacts from future development.

Sustainable Salmon Fisheries Policy for the State of Alaska: "Salmon habitat in freshwater should be protected on a watershed basis, including appropriate management of riparian zones". Essential habitat in the policy "includes spawning and incubation areas, freshwater rearing areas, estuarine and near shore rearing areas, offshore rearing areas, and migratory pathways."

Carrying Capacity

Research Plan: "Carrying capacity for a given population is considered to be the limiting size of that population that can be supported by an ecosystem over a period of time and under a given set of environmental conditions." Defined by Warren S. Wooster, School of Marine Affairs, University of Washington, 3707 Brooklyn Ave. N.E., Seattle, WA 98105-6715.

Appendix. Glossary of Terms (Page 2 of 9)

Clinical health of the population
Research plan: survival.

Community
Research Plan: a community is composed of the relationships among persons who consider themselves to be part of that community, be it geographic or interest based.

Community capacity
Research Plan: To build community capacity is to train local residents, and to encourage public involvement in fisheries related work and decision-making, and develop expertise in communities to maintain biodiversity and ecological health. The public is educated on the pros and cons of their actions, e.g., the impacts from throwing batteries in the river, and the importance of water quality. The community is educated on the rationale for management actions. Capacity building means that more local people are involved in all aspects of research, including reasons for initiating research. Mentoring and internships for younger people and offering educational courses are tools used in building community capacity.

Conservation unit or geographic area
Research plan: These aggregates share a common genetic lineage and can be managed effectively as a unit by virtue of their common productivity and, through behavior, common vulnerability to existing fisheries. Even a species could be a conservation unit. However, conservation units need careful consideration – it may not be possible to always manage for conservation units. A conservation unit can be represented as a specific geographic area. The term 'unit' must be defined.

Canada's emerging Wild Salmon Policy: "A conservation unit is defined as a group of one or more local populations that share a common genetic lineage and can be managed effectively as a unit by virtue of their common productivity and vulnerability to existing fisheries. " To be further refined.

Consult
Umbrella Final Agreement between the Government of Canada, the Council for Yukon Indians and the Government of Yukon, 1993: "Consult" or "Consultation" means to provide:

i. to the party to be consulted, notice of a matter to be decided in sufficient form and detail to allow that party to prepare it's views on the matter;
ii. a reasonable period of time in which the party to be consulted may prepare it's views on the matter, and an opportunity to present such views tot he party obliged to consult; and
iii. full and fair consideration by the party obliged to consult of any views presented

Customary trade
State of Alaska Fish and Game Laws and Regulations Annotated Sec. 16.05.940 (8) "customary trade means the limited noncommercial exchange, for minimal amounts of cash, as restricted by the appropriate board, of fish or game resources; the terms of this paragraph do not restrict money sales of furs and furbearers."

Appendix B. Glossary of Terms (Page 3 of 9)

Federal Register / Vol. 66, No. 133, Sec. __. 4: The exchange for cash of fish and wildlife resources regulated in this part, not otherwise prohibited by Federal law or regulation, to support personal and family needs; and does not include the trade, which constitutes a significant commercial enterprise.

Canadian definition: See Subsistence.

Efficacy

Dictionary: power to produce a desired or intended result; how effective you are at achieving what you set out to accomplish.

Enhancement

Research Plan: Uses the Yukon Salmon Agreement definition.

Yukon Salmon Agreement: "Enhancement means expanding a wild salmon stock beyond its natural production level."

Sustainable Salmon Fisheries Policy for the State of Alaska (Alaska 5 AAC 39.222):
"Enhanced salmon stock is a stock of salmon that is undergoing a specific manipulation (such as hatchery augmentation, lake fertilization, to enhance its productivity above the level that would naturally occur."

Escapement range

Research Plan: A range needs to be further defined.

Alaska's Policy for Statewide Salmon Escapement Goals: "The lower and upper limits of the escapement range will be consistent with MSY and will be based on factors such as variability in stock productivity and data uncertainty".

Sustainable Salmon Fisheries Policy for the State of Alaska (Alaska 5 AAC 39.222):
"Escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the stock measured."

Goal

Dictionary: A long time achievement that contributes to the accomplishing of a mission.

Guidance

Research Plan: Guidance includes stewardship, and encompasses research, Traditional Knowledge, and local knowledge.

Habitat

Canadian Fisheries Act S.34(1) "Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes" In Canadian jurisprudence, this may include the immediate riparian zone, non-

Appendix B. Glossary of Terms (Page 4 of 9)

fish bearing tributaries that flow into and carry food to fish bearing streams, and streams that may seasonally carry water and support fish.

Index system

Research Plan: An escapement unit defines an escapement index. An index area is broad, not specific, and data gathered tends to be limited (e.g. one – three counts of salmon in a specific stream reach). Tests for several years are needed to calibrate an index system with actual abundance. Tests for several years are needed to calibrate an index system. Existing indices can be evaluated and refined through validation studies using alternative abundance estimation methods. Which tributaries are accurate representatives of escapements in any system will need to be determined at the sub-basin level.

Instream flow reservation

Research Plan: In the US, a state declares instream flows for fish habitat to be beneficial and appropriates water for that purpose. Thus, aquatic habitat is protected through the reservation of water. Filing for water reservations is a legal process that requires characterization of the aquatic habitat, information on flow requirements of fishes, etc. In the Yukon River Basin in Canada, "minimum flows" retained in a stream for the maintenance of fish or fish habitat may be a requirement of a Water License granted by a Provincial or Territorial government.

Issue

Dictionary: An impediment to overcome, an uncertainty, an information gap, which prevents you from reaching your objective.

Limits of the Yukon River ecosystem

Research Plan: Ecosystem boundaries need to be established, because no one knows the total migratory pathway of Yukon River salmon.

Local Knowledge

Research Plan: Information regarding the distribution, abundance and use of the fisheries resource gained through observation by, or communicated to and retained by, a current or past member of a geographical community.

Management Plan

Research Plan: An informal harvest strategy, which is important to meet treaty obligations and incorporates the following objectives: integrated fisheries management plans (Canada), and ecosystem concepts.

Sustainable Salmon Fisheries Policy for the State of Alaska: Protect wild salmon and its habitat in order to maintain resource productivity. Maintain escapements within ranges necessary to conserve and protect potential salmon production and to maintain normal ecosystem functioning. Harvest salmon in a manner consistent with the degree of uncertainty regarding the status and biology of the resource. Establish and apply an effective

Appendix B. Glossary of Terms (Page 5 of 9)

management system to control human activities that affect salmon. Maintain public support and involvement for sustained use and protection of salmon resources

Marine derived nutrients

Research Plan: defined as nitrogen, carbon, iron, phosphorus or other elements that may bio-accumulate in salmon during oceanic residency and be transferred to inland terrestrial and/or aquatic habitats during the tertiary stages of the salmon life cycle (migration, dying, decomposition). The marine contribution is usually measured in isotopic ratios.

Mission

Dictionary: A responsibility to fulfill.

Mitigation:

Canadian definition: "actions taken during the planning, design, construction and operation of works and undertakings that alleviate potential adverse effects on the productive capacity of fish habitats."

US definition: Areawide Land Management Policies, " When authorizing the use or development of state lands, the Departments of Natural Resources and Fish and Game will recognize the requirements of the activity or development and the benefits it may have to habitat when determining stipulations or measures needed to protect fish, wildlife, or their habitats. The costs of mitigation relative to the benefits to be gained will be considered in the implementation of this policy. All land use activities will be conducted with appropriate planning and implementation to avoid or minimize significant adverse impacts on fish, wildlife, or their habitats. The departments will enforce stipulations and measures, and will require the responsible party's failure to comply with applicable law, regulations or the conditions of the permit or lease."

Non-human consumption

Research Plan: Dog food.

Option

Dictionary: A possible course of action or project to overcome an issue.

Precautionary approach

Research Plan: To manage with caution commensurate with uncertainty.

Sustainable Salmon Fisheries Policy for the State of Alaska:

"A precautionary approach, involving the application of prudent foresight, that takes into account the uncertainties in salmon fisheries and habitat management; the biological, social, cultural and economic risks; and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality."

Appendix B. Glossary of Terms (Page 6 of 9)

Canada's Precautionary Approach Policy:

"The precautionary approach: 1) is a distinctive decision-making tool within risk management [that primarily affects the development of options]; 2) decisions are to be guided by society's chosen level of protection against risk; 3) sound scientific information and its evaluation must be the basis for its application and ...should be established relative to the chosen level of protection; 4) mechanisms should exist for reevaluating the basis for decisions; 5) a greater degree of transparency, clearer accountability and increased public involvement are appropriate." The precautionary approach is a distinctive approach to managing threats of serious or irreversible harm where there is scientific uncertainty. It recognises absence of full scientific certainty shall not be used as a reason to postpone decisions where a risk of serious or irreversible harm exists.

Precise

Research Plan: Precision is how close repeated measurements are of the same parameter. Precision may not be a relevant descriptor for measurements taken in the Yukon. Precision is often confused with "accuracy"; accuracy is how close an estimated value is to the actual value.

Prioritization

Research Plan: Priorities change, they are dependent on changes in the ocean, users, and habitat. Prioritization is a means, a tool.

Research

Research Plan: a tool of management.

Risk

Research Plan: Risks can be to the resource (overexploitation), manager (missing escapement goals, treaty shares), or public (economic, social and loss opportunity). Using a conservative or precautionary approach is one way to manage risk.

Definition in Smith et al. 1993, Risk Evaluation and Biological Reference Points for Fisheries Management, Canadian Special Publication of Fisheries and Aquatic Sciences120: "Risk in fisheries management involves the probability of an undesirable event (e.g., stock abundance falling to an unacceptable level) involving some consequence or loss (e.g., diminished social or economic benefits derived from fishing) in relation to a reference point."

Definitions in Rowe, 1998, An Anatomy of Risk, Krieger Publishing: "Risk involves the existence of a possible unwanted consequence, and the uncertainty in the occurrence of that consequence."

Risk aversion - to take action to control risk; managers have varying levels of aversion.

Appendix B. Glossary of Terms (Page 7 of 9)

Risk determination – a definition of the consequences and value of the consequences to those affected.

Risk evaluation – the process of anticipating the societal response to risk.

Risk management – to design policies to reduce or avert unacceptable risks.

Socioeconomics

Research Plan: The study of human or non-human use and value of the resource; the amount sold or traded, the economic value of the resource as food, and the cultural value of the resource to society. Recognizes non-human use as a potential issue. This plan will consider trade and barter vs. food for the table, and socioeconomic factors in decision-making.

Stewardship

Research Plan: Stewardship is caring for something entrusted to you, mothering the resource, to which the aboriginal and the traditional use and dependence on the resource speaks. Considerations for stewardship include human vs. non-human consumption; and the values of this fishery to residents of both countries, and to users and managers of the resource. Stewardship includes sharing scientific, traditional and local knowledge. Stewards participate in management activities in various ways such as: passing on information to resource managers, by reporting capture of marked fish and by participating in sampling programs.

Fisheries and Oceans Canada, Building Awareness and Capacity: An Action Plan for Sustainable Development: "Use of the resource so that succeeding generations and global neighbors will also have resources available for their use... Integration among generations, across geography and among sectors of society...the responsibility is shared by all".

Stock

Research Plan: An aggregate of groups that breeds among itself; isolated breeding; distinct biodiversity.

Sustainable Salmon Fisheries Policy for the State of Alaska: "[Salmon stock is] a locally interbreeding group of salmon that is distinguished by a distinct combination of genetic, phenotypic, life history and habitat characteristics; or an aggregation of two or more interbreeding groups which occur within the same geographic area and is managed as a unit."

Canada's Wild Salmon Policy: "the part of a fish population which is under consideration from the point of view of actual or potential utilization."

Strategic planning

Research Plan: A repetitive decision-making activity involving thinking and social processes that help to design what is perceived as a desirable outcome. A plan can be updated annually,

Appendix B. Glossary of Terms (Page 8 of 9)

or at regular intervals to assess how the dynamics of situations and priorities have changed. This plan is short term, projecting 3-5 years into the future. The purpose of planning is to, among other things, assist in optimizing salmon production. Planning is done by articulating goals and objectives, defining issues, and brainstorming for options. Relevant plans and policies already written for integration into this plan should be reviewed, starting with the Yukon Salmon Agreement, especially what the JTC shall do. Planning should be proactive, think about what we need and not focused on existing projects, be creative. This plan will help us link and integrate with other plans and could influence other planning initiatives.

Subsistence

ANILCA: The customary and traditional uses by rural Alaska residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing; for personal or family consumption, and for customary trade.

Canadian definition (as defined in the Umbrella Final Agreement of the Yukon Land Claims): a) the use of Edible Fish or Wildlife Products by a Yukon Indian Person for sustenance and for food for traditional ceremonial purposes including potlatches; and b) the use by a Yukon Indian Person of Non-Edible By-Products of harvests under (a) for such domestic purposes as clothing, shelter or medicine, and for domestic, spiritual and cultural purposes; but c) except for traditional production of handicrafts and implements by a Yukon Indian Person, does not include commercial uses of Edible Fish or Wildlife Products or Non-Edible By-Products.

Yukon Indian People shall have the right to give, trade, barter or sell among themselves and with beneficiaries of adjacent Transboundary Agreements in Canada all Edible Fish or Wildlife Products harvested by them, or limited to a Basic Needs Level allocation or to a basic needs allocation of Salmon, in order to maintain traditional sharing among Yukon Indian People and with beneficiaries of adjacent Transboundary Agreements for domestic purposes but not for commercial purposes.

Success

Research Plan: Evaluate projects for their effectiveness at achieving the intended outcome, for example measure by marking fish and then observing how many return to the spawning grounds.

Sustainable Fishery

Sustainable Salmon Fisheries Policy for the State of Alaska: A fishery that persists and obtains yields on a continuing basis; characterized by fishing activities and habitat alteration, if any, that do not cause or lead to undesirable changes in biological productivity, biological diversity, or ecosystem structure and function, from one human generation to the next.

Appendix B. Glossary of Terms (Page 9 of 9)

ADF&G Salmon Escapement Goal Policy, Maximum Sustained Yield (MSY): The greatest average annual yield from a stock. In practice, MSY is approached when a constant level of escapement is maintained on an annual basis regardless of run strength. The achievement of MSY requires a high degree of management precision and scientific information regarding the relationship between escapement and subsequent return.

Uncertainty

Dictionary: A lack of information about the values of parameters (measurement uncertainty), a lack of information about which parameters adequately describe the process (descriptive uncertainty), or suspect information.

Wild salmon

Research Plan: Naturally reproducing stocks.

Sustainable Salmon Fisheries Policy for the State of Alaska: "Wild stock is a stock of salmon that originated in a specific location under natural conditions. It is distinct from an introduced stock, although some introduced stocks may come to be considered wild if they are self-sustaining for a long period of time. Wild stocks can become enhanced or rehabilitated, if their productivity is augmented by supplemental means."

Canada's emerging Wild Salmon Policy: "A salmon produced by natural spawning in fish habitat from parents that were spawned and reared in fish habitat. This definition recognizes that wild salmon may continue to exist even after intensive cultivation of a previously wild population. Wild salmon in cultivated populations warrant protection under the policy to ensure the long-term viability of populations in natural surroundings. However, the policy may not afford similar protection to transplanted salmon that now spawn in habitat where the species did not occur naturally."

Appendix C Table 1 Projects List (Page 1 of 8)

No[1]	Status[2]	Species[3]	Title	Responsible Agency(s) or Contractor(s)
1	O	3	Rampart-Rapids fall catch-per-unit-effort video monitoring	Stan Zuray
2	O	1,2	Salcha River Chinook and chum salmon tower	BSFA
3	O	1,2	Chena River Chinook/chum salmon counting tower	BSFA
4	O	1,2,3,4	Commercial Catch and Effort Assessment	ADF&G
5	O	1,2,3,4	Commercial Catch Sampling and Monitoring	ADF&G; ADPS
6	O	1,2,3,4	Subsistence and Personal Use Catch and Effort Assessment	ADF&G
7	O	1,2,3,4	Sport Catch, Harvest and Effort Assessment	ADF&G
8	S	1	Yukon River Chinook Salmon Stock Identification	USFWS & ADF&G, DFO, OSM
9	O	1,2,3,4	Yukon River salmon escapement surveys and sampling	ADF&G / TCC/BSFA
10	S	1,2	Hooper Bay Subsistence Fishing Monitor	Hooper Bay Trad. Council, USFWS
11	O	1,2	Lower Yukon River Set Gillnet Test Fishing	ADF&G
12	O	1,2,3,4	Lower Yukon River Drift Test Fishing	ADF&G
13	S	3,4	Yukon River Salmon Escapement Genetic Surveys and Sampling	Asa'carsarmiut Trad. Council
14	O	1,2,4	East Fork, Andreafsky River Weir	USFWS, Yupiit of Andreafsky, Algaaciq Tribal Council
15	O	1,2,3,4	**Yukon River Sonar**	ADF&G, AVCP
16	O	2,3	Lower Yukon Chum Salmon, Genetic Sampling	ADF&G
17	S	1	**Yukon River Chinook Salmon Tagging and Telemetry Study**	ADF&G
18	P	1	Marshall, Drift Gillnet Test Fishing	AVCP, 'Marshall, Traditional Council
19	O	2	Anvik River Sonar	ADF&G
20	O	1,2	Kaltag Creek Tower	City of Kaltag, ACES, BSFA
21	P	1,2	Nulato River Tower	NTC, ADF&G, BSFA
22	O	1,2	Gisasa River Weir	USFWS
23	O	1,2	Clear Creek Weir	BLM
24	O	1,2	Henshaw Creek Weir	BSFA, TCC, USFWS
25	O	3	Chandalar River Sonar	USFWS
26	O	3	Sheenjek River Sonar	ADF&G
27	O	3,4	Nenana River Escapement Surveys	BSFA

[1] Projects are not numbered by priority.
[2] O = ongoing, P = past, S = scheduled to sunset
[3] 1 = Chinook, 2 = summer chum, 3 = fall chum, 4 = coho

Appendix C Table 1 Projects List (Page 2 of 8)

No.	Status	Species	Title	Responsible Agency(s) or Contractor(s)
28	O	1,2	Tanana Village South bank Yukon River Fish Wheel, Test Fishing	ADF&G, USFWS, BSFA
29	O	3,4	Tanana River Fish Wheel Test Fishing	ADF&G, BSFA
30	O	3,4	Tanana River Tagging	ADF&G, BSFA
31	P	1,2	Beaver Creek Weir	BLM
32	O	3,4	Toklat River Ground Survey	ADF&G
33	P	3	Toklat River Fall Chum Salmon R&E	ADF&G
34	O	3	Upper Yukon River Chum Salmon Genetic Stock Identification	USFWS
35	P	1,2	Kateel River Weir	USFWS
36	O	1,2,3,4	Canada/Yukon River Salmon Information and Education Program	YRDFA
37	P	1,2,3,4	Chatanika River Dam Removal	USFWS
38	S	1,2,3,4	Interview elders regarding Traditional Ecological Knowledge of salmon species	USFWS/OSM
39	S	1,2,3,4	Salmon Production Habitat Assessment in the Yukon River Drainage	BLM
40	O	1,2,3,4	Public policy program support --- Annual meeting support	BSFA
41	S	1	Radio Tag Recovery, Lower Yukon River	BSFA
42	O	1,2,3,4	Inseason management teleconferences	YRDFA
43	P	1	Ichthyophonus Chinook salmon study	U of W, Kocan
44	S	1	Chinook Salmon Capture for Radio Telemetry Study URE 03-03	BSFA
45	O	3,4	Kaltag Village Drift Gill Net Test Fishing URE 06-03	City of Kaltag
46	O	3	Project to enhance mainstem salmon escapement URE 12-03	EASFA
47	O	1	Middle Yukon River Chinook Sampling Project URE 15N-03	City of Kaltag
48	O	1,2,3,4	Yukon River Educational Exchanges URE 10-04	YRDFA
49	S	1	Aerial Survey for Radio Telemetry Study URE 18N-04	ADF&G
50	O	3	**Rampart Rapids tagging study** 01-032	USFWS
51	O	5	Rampart Rapids summer CPUE video monitoring 01-197	Stan Zuray
52	S	3	Abundance and handling mortality of fall chum salmon in the Yukon River above the Tanana River 02-011	USFWS
53	S	1	Sex ratios of juvenile and adult Chinook salmon in the Kuskokwim and Yukon Rivers 02-097	USFWS
54	O	3	Kantishna Tributary Assessment	OSM
55	S	1	Ichthyophonus Feasibility	ADF&G
56	O	1,2,3,4	YRDFA biotechnician training	YRDFA
57	O	1	Scale Pattern Analysis (SPA - Chinook)	ADF&G
58	O	1,3,4	**Border Sonar feasibility**	ADF&G

Appendix C Table 1 Projects List (Page 3 of 8)				
No.	**Status**	**Species**	**Title**	**Responsible Agency(s) or Contractor(s)**
59	O	1,2	Tozitna weir	BLM
60	O	5	Survey and Reclamation of Salmon Streams - Chatanika River Stock Monitoring	YRDFA
61	O	1,4	Southside Tanana/Delta Creek Salmon Habitat Survey	YRDFA
62	O	3,4	Seventy-Mile River Chum Salmon Spawner Survey	YRDFA
63	S	1,2,3,4	Interception of Salmon in Marine Trawl Fisheries	YRDFA
64	S	2,3	Interactions Between Wild Yukon River Chum Salmon and Hatchery Salmon Relative to Growth and Survival	YRDFA
65	S	1,2,3,4	Ocean Carrying Capacity Juvenile Salmon Survey	YRDFA
63	S	1,2,3,4	Interception of Salmon in Marine Trawl Fisheries	YRDFA
66	O	1,2,3,4	Survey and Reclamation of Salmon Streams – Using Traditional Ecological Knowledge to Identify Streams for Inclusion into the Anadromous Waters Catalog	YRDFA
67	O	1,4	Andreafsky River Juvenile Salmon Study	YRDFA
68	O	4	Spawning surveys of Anvik coho salmon	OSM
69	S	1	Phenotypic Identification of Chinook Salmon Stocks	YRDFA
70	O	1,2,3,4	Youth Opportunity - sample taking training	TCC
71	O	1,2,3,4	Tribal Civilian Community Corps-fisheries biology training	TCC
72	O	1,2,3,4	JTC meetings	All
73	O	1,2,3,4	Yukon River panel meetings- Communication Subcommittee	All
74	O	3,4	Fishing Branch Weir	VGFN, DFO
75	O	1	Whitehorse Rapids Fishway	YFGA
76	S	1,3	Chandindu River Weir	YRCFA
77	O	1,3,4	Escapement Sampling	DFO, 'LGL/U. of Wash.
78	S	1	Upper Yukon R. and Porcupine R. Chinook radio tag tracking	DFO, NMFS,
79	S	1	Chinook Radio Tag Tracking	USFWS
80	O	1,3,4	DFO commercial catch monitoring	DFO
81	O	1,3,4	Yukon FN catch monitoring	DFO
82	O	1,3,4	DFO commercial harvest sampling	DFO
83	O	1	DFO escapement index surveys – Chinook	DFO
84	O	3	DFO escapement index surveys - fall chum	DFO
85	O	1	Whitehorse Rapids Hatchery	YF&GA
86	O	1	Whitehorse Rapids hatchery coded wire tagging	YF&GA
87	O	1	MacIntyre incubation box	WCC/NRI

Appendix C Table 1 Projects List (Page 4 of 8)				
No.	**Status**	**Species**	**Title**	**Responsible Agency(s) or Contractor(s)**
88	O	1	MacIntyre Creek coded wire tagging	
89	P	1	Mayo Area Pilot Incubation Projects	YSC HCSP
90	O	1,3,4	Yukon FN catch sampling	
91	O	1,3,4	DFO Yukon conservation catch card	YSC, DFO
92	O	1,3,4	Inseason fishery updates	DFO
93	O	1	Yukon Chinook mark-recapture	DFO
94	O	3	Yukon fall chum mark-recapture	DFO
96	O	1,3,4	DFO/YSC community consultations	DFO, YSC
97	O	1,3,4	Yukon River Panel R&E strategic planning	
98	O	1,3	Salmon in the classroom	DFO/schools
99	O	1,3,4	Yukon contaminants program (Northern Contaminants Prgm)	DIAND,
100	O	1,3,4	DFO disease sampling/screening	DFO
101	P	1	Aerial survey of Swift and Morley Rivers	Teslin Tlingit Council
102	P	1,3	Compilation of TEK and Scientific knowledge in Teslin area	Teslin Tlingit Council
103	O	1	Hutshi Lake/upper Nordenskiold Chinook utilization and Restoration study	Champagne Aishihik First Nation
104	P	1	Blind Creek aerial survey	Ross River Dena Council
105	P	1,3	Compilation of existing TEK/scientific data for upper Pelly R.	Ross River Dena Council
106	P	1	Augmentation of R&E program through training of personnel	Kwanlin Dun First Nation
107	P	1,3	Augmentation of R&E program through training of personnel	White River First Nation
108	O	1,3	Training of personnel	Kluane First Nation
109	P	1,3	Feasibility Study – Measurement Suspended Solids RE-02-01	T. Christee
110	O	1,3	Chum Spawning Ground Recoveries/Educ & Stewardship RE-07-01	Kluane First Nation
111	P	1,3	Pelly Salmon Information Workshop RE-10-00	YSC HCSP
112	P	1,3	Carmacks Salmon Information Workshop RE-12-01	Carmacks River Vision Soc
113	O	1	Klusha creek Habitat Monitoring Program RE-13-01	Little Salmon/Carmacks FN
114	O	1	Restoration Fish Passage/Highway Culverts RE-16-01	Leberge Env. Services
115	O	1,4	Salmon Research Training & Coho/Chinook Hab. Asses. RE-24-01	VGFN
116	P	1	Snag Creek Inventory & Assessment – Training Project RE-25-01	White River First Nation
117	P	1	Wolf Creek Riparian Re-vegetation & Mine Reclamation RE-26-01	Yukon Conservation Soc.
118	O	1	Klondike River Sampling & Redd Mapping RE-27-01	YRCFA/THFN
119	S	1	McQueston River Logjam Diversion Completion RE-30-01	Nacho Nyak Dun FN

Appendix C Table 1 Projects List (Page 5 of 8)

No.	Status	Species	Title	Responsible Agency(s) or Contractor(s)
120	P	1	Chinook Salmon Habitat Assessment–Pelly Lakes Region RE-32-01	Ross River Dene Council
121	P	1	Inventory Chinook Habitat – Tincup Creek Drainage RE-33-01	Klane First Nation
122	P	1	Beaver Management – Deadman Creek RE-34-01	Teslin Tlingit Council
123	P	1	Beaver Mitigation – Swift River RE-35-01	Teslin Tlingit Council
124	P	1	Wolf Creek Restoration and Enhancement Project01-YT-RSW-001	Yukon Fish and Game Association
125	P	1	Ibex River Enhancement 01-YT-ST-007	Wood Street Centre Experiential Programs
126	O	1	Juvenile Chino CRE-01-02ok and chum salmon outmigration timing and characteristics	YRCFA, DDRRC, YSC
127	S	1	Radio tag recovery, THFN Traditional Territory CRE-02-02	YRCFA, THFN
128	O	1	Klondike – incubation/outplanting facility feasibility CRE-06-02	YRCFA, THFN
129	O	1,3	First Fish 2002, youth cam CRE-07-02p	YRCFA, THFN
130	P	1	Coal Creek stream study-spawning/rearing CRE-08-02	YRCFA, THFN
131	O	3	Chum salmon test fishery in live capture fish wheels CRE-09-02	YRCFA, THFN
132	O	1	Chinook salmon test fishery, Dawson CRE-10-02	YRCFA, THFN
133	P	1,3,4	Traditional/Local knowledge salmon surveys CRE-16-02	NYRRC, VGFN
134	O	1	McQuesten River watershed assessment-restoration plan CRE-20-02	Nacho Nyak Dun FN
135	P	1	Salmon habitat signs at Fraser Falls CRE-21-02	Nacho Nyak Dun FN
136	P	H	Lower Stewart River habitat classification and mpg. Pilot CRE-24-02	Nacho Nyak Dun FN
137	O	1	Pelly River tributary Chinook habitat and use survey CRE-27-02	Selkirk First Nation
138	O	1	Mica Creek salmon habitat monitoring and restoration CRE-28-02	Selkirk First Nation
139	P	1,3	Groundwater ID and investigating – Upper Yukon R. CRE-30-02	Selkirk First Nation
140	O	1,3	Carmacks watershed camp CRE-33-02	LLSCFN/YS Hab. Stew.
141	P	1	Hess River spawning area assessment CRE-39-02	Ross River Dena Cl.
142	P	1	Salmon rearing stream signage CRE-40-02	Teslin Tlingit Council
143	O	3	Chum spawning sites – upper Teslin River CRE-41-02	Teslin Tlingit Council
144	P	1	Preliminary assessment of Chinook salmon incubation/distribution Swift River B.C. CRE-42-02	Teslin Tlingit Council
145	P	1,3	Teslin River watershed salmon information gathering CRE-44-02	Teslin Tlingit Council
146	P	1	Teslin River Chinook spawning location CRE-45-02	Teslin Tlingit Council
147	O	1	Teslin Tributary beaver management CRE-47-02	Teslin Tlingit Council
148	O	1	McClintock River watershed salmon management plan - CRE-50-02	Kwanlin Dun FN
149	O	1	Upper Takhini River restoration plan and Chinook investigations CRE-54-02	Champ. Aishihik FN

Appendix C Table 1 Projects List (Page 6 of 8)

No.	Status	Species	Title	Responsible Agency(s) or Contractor(s)
150	P	3	Beaver dams upwelling ground water, chum salmon CRE-56-02	Kluane First Nation
151	O	3	Investigation spawning chum – Kluane Lake CRE-57-02	Kluane First Nation
152	P	1	Conserve – Restore Chinook habitat, Tincup Creek CRE-58-02	Kluane First Nation
153	O	1	Chinook utilization of upper White River watershed CRE-60-02	White River First Nation
154	P	1,3	FN's Fisheries technician and stewardship capacity building –course development CRE-68-02	Yukon College
155	P	1,3	Develop protocol restore fish habitat in placer mining streams CRE-86-02	Miles & Associates/EDI
156	S	1	Chinook radio tracking/telemetry pilot project CRE 17-03	NYRRC;VGFN
157	O	1	Lower Mayo River Fisheries and Channel Assessment CRE 19-03	NNDFN
158	O	1	McQuesten River water quality monitoring CRE 23-03	NNDFN
159	P	1	Stewart River weir feasibility study CRE 26-03	NNDFN
160	O	3	Chum tagging test fishery – Porcupine River CRE 27-03	NYRRC;VGFN
161	O	3	Chum spawning ground recoveries – Minto Canada CRE 29-03	Selkirk FN
162	P	1,3	Big Creek investigations CRE 33-03	LSCFN
163	O	1	Little Salmon Carmacks FN salmon habitat surveys CRE 34-03	LSCFN
164	O	1	Klusha Creek and Tatchun Creek Beaver Management CRE 35-03	LSCFN
165	O	1	Blind Creek Chinook salmon enumeration weir CRE 37-03	RRDC
166	O	1,3	Compilation and mapping fisheries data CRE 43-03	TTC
167	S	1,3	Salmon Planning White River TT CRE 53-03	WRFN
168	P	3	Kluane River chum freshwater ecology CRE 57-03	Grace Cohoe, Kluane FN
169	P	1,3	Traditional/Local knowledge salmon survey –Kluane CRE 58-03	Grace Cohoe, Kluane FN
170	O	3	Beaver Mgmt – chum spawning sloughs Kluane CRE 59-03	Grace Cohoe, Kluane FN
171	S	1	Telemetry Tracking Chinook KFN TT and weir feasibility CRE 60-03	DFO StAD
172	O	1	Wolf Creek Monitoring CRE 64-03	YFGA
173	O	1,3	Yukon Schools fry releases and habitat studies CRE 67-03	Streamkeepers North Society
174	O	1	Dev of Fisheries Mngmt Plan City of Whitehorse CRE 71-03	City of Whitehorse
175	S	1,3	Commercial fish plant upgrades value added proc CRE 72-03	C. Ball/ S. Fleurant
176	S	1,3	Commercial salmon fishery feasibility study CRE 75-03	YRCFA/THFN
177	S	1	Aerial Telemetry Survey – L. Stewart, Pelly Systems CRE 77-03	B. Mercer
178	S	1	Chinook telemetry – Canadian Section YR Basin CRE 78-03	Haldane Environmental Services
179	S	3	MHC variation and stock ID of YR chum salmon CRE 79-03	T. Beacham/DFO
180	S	1,3	Yukon Queen II investigations CRE 95-03	DDRRC

Appendix C Table 1 Projects List (Page 7 of 8)

No.	Status	Species	Title	Responsible Agency(s) or Contractor(s)
181	O	1,3	Yukon Fisheries Field Assistant program CRE 104-03	Yukon College; Dawson City
182	O	1,3,4	Yukon Stewardship Program CRE 149N-03	YFWMB
183	O	3	Chum Fishery Substitution CRE 106-03	NYRRC/VGFN
184	O	1-3	GSI Laboratory	
185	P	1	Tatchun Creek Weir	D. Otto
186	O	1,2,3,4	Juvenile salmon studies, Lower Yukon R, marine freshwater interface, all species	
187	P	1	Chena River juvenile Chinook overwintering study	ADF&G
188	O	1,3	Federal Contaminated Sites Action Plan CDN	DFO
189	O	1,2,3,4	Fish Distribution System	
190	O	1,2,3,4	Board of Fish Advisory Committees	ADF&G
191	O	1,2,3,4	Office of Subsistence Management Reg. Adv. Councils	FIS-OSM
192	O	1,3,4	Yukon RRCs	YFWMB
193	O	1,2,3,4	Fish Information Summary System	DFO
194	P	1,3	Local and TEK Mayo Area	NNDFN
195	P	1,2,3,4	YRDFA TEK Project	
196	O	1,2,3,4	YRDFA Annual Meeting	YRDFA
197	P	1,2,3,4	HCSP	DFO
198	O	1,2,3,4	Partners Program	OSM
199	O	1	Germaine Creek	M. Miles & Associates
200	O	1,2,4	Andreafsky Science Camp	
201	P	1	Yukon River Tributaries juvenile Chinook utilization	
202	O	1	Croucher Creek juvenile Chinook salmon studies	YCS/DFO Research/KDFN
203	P	1	Overwinter ecology of juvenile Chinook salmon	DFO Research
204	P	1	Streambed profiling and the importance of large woody debris for juvenile Chinook habitat	Simon Fraser University/DFO Research
205	P	1	Affects of suspended sediments on foodwebs of juvenile Chinook salmon	Simon Fraser University/DFO Research
206	O	1,2,3,4	Contaminants Study	DIAND
207	O	1,2,3,4	YR Intertribal Watershed council	
208	P	1	Characterization of foodweb structure and organochlorine accumulation in lakes in the Yukon	University of Alberta / Freshwater Institute/DFO C&A
210	O	1,4	Juvenile Chinook/Coho Habitat Assessment CRE-15-04	VGFN

Appendix C Table 1 Projects List (Page 8 of 8)				
No.	**Status**	**Species**	**Title**	**Responsible Agency(s) or Contractor(s)**
211	O	1	Lower Mayo River Fisheries R&E – Phase 2 CRE-19-04	NNDFN
214	O	1,3	Teslin River Sub-basin Stewardship CRE-47-04	TTC
216	O	1	Upper Nordenskiold River Stewardship CRE-55-04	CAFN
217		3	Beaver Mngmt – Chum Spawning Sloughs - Kluane CRE-59-04	KFN
218	O	1,3	McIntyre Creek salmon incubation project CRE-65-04	Yukon College
219	O	1,3	Yukon Schools Fry Releases & Habitat studies CRE-67-04	DFO
220	O	1	Germaine Creek Restoration Assessment CRE-87-04	M. Miles and Associates
221	P	1,3	Salmon Info Workshop Ta'an Kwach'an TT CRE-93N-04	Ta'an Kwach'an First Nation
223	O	1,2,3,4	Yukon Stewardship Program CRE-98-04	YFWMB
225			YR Salmon Opportunity Assess & Partnership Strat CRE-109N-04	Center f/ Environmental Stewardship
226		1	Chatanika Counting Tower	ADF&G – Sport Fish
227		1	Goodpaster Chinook project assessment	BSFA
228	O	3227	Chum test fishery – Dawson	YRCFA, THFN

Appendix C Table 2 Projects listed relative to goals, objectives and issues in the JTC plan

Projects in bold fulfill treaty obligations

Species: 1-Chinook, 2-summer chum, 3- fall chum, 4. coho
Status: O- ongoing, P- past, S- sunset

	Species	Status
1. Assess and achieve fishery management objectives		
1.1 Monitor or project escapements by CMU		
1.1.1 Estimate or index escapements		
165 Blind Creek Chinook salmon enumeration weir	1	O
83 DFO escapement index surveys - Chinook	1	O
84 DFO escapement index surveys - fall chum	3	O
19 Anvik River sonar	2	O
93 Yukon Chinook mark-recapture	1	O
94 Yukon fall chum mark-recapture	3	O
25 Chandalar River sonar	3	O
26 Sheenjek River sonar	3	O
2 Salcha River Chinook and chum counting project	1,2	O
3 Chena River Chinook/chum salmon counting tower	1,2	O
20 Kaltag Creek tower	1,2	O
21 Nulato tower	1,2	P
22 Gisasa River weir	1,2	O
23 Clear Creek weir	1,2	O
27 Nenana River escapement surveys	3,4	O
32 Toklat River ground survey	3,4	O
9 Yukon River salmon escapement surveys and sampling	1,2,3,4	O
24 Henshaw Creek weir	1,2	O
14 East Fork Andreafsky River weir	4,1,2	O
59 Tozitna weir	1,2	O
74 Fishing Branch Weir	3,4	O
75 Whitehorse Rapids Fishway	1,3	O
76 Chandindu River Weir	1,3	S
68 Spawning surveys of Anvik coho salmon	4	O
31 Beaver Creek Weir	1,2	P
35 Kateel River Weir	1,2	P
185 Tatchun Creek Weir	1	P
101 Aerial surveys of Swift and Morley Rivers	1	P
104 Blind Creek aerial survey	1	P
118 Klondike River Sampling & Redd Mapping	1	O
141 Hess River spawning area assessment	1	P
143 Chum spawning sites - upper Teslin River	3	O
146 Teslin River Chinook spawning location	1	P
151 Investigation spawning chum - Kluane Lake	3	P
1.1.2 Estimate the stock biological or other composition of escapements (for example: scales at a weir)		
161 Chum spawning ground recoveries – Minto Canada	3	O
76 Chandindu River weir	1,3	S

Appendix C Table 2 (Page 2 of 15) Species Status

165 Blind Creek Chinook salmon enumeration weir	1	O
19 Anvik River sonar	2	O
25 Chandalar River sonar	3	O
26 Sheenjek River sonar	3	O
22 Gisasa River weir	1,2	O
21 Nulato tower	1,2	P
32 Toklat River ground survey (vertebrae)	3,4	O
2 Salcha River Chinook and chum counting project	1,2	O
3 Chena River Chinook/chum salmon counting tower	1,2	O
9 Yukon River salmon escapement surveys & sampling	1,2,3,4	O
24 Henshaw Creek weir	1,2	O
74 Fishing Branch weir	3,4	O
75 Whitehorse Rapids Fishway	1	O
77 Escapement Sampling	1,3,4	O
110 Chum Spawning Ground Recoveries/Educ & Stewardship	1,3	O
185 Tatchun Creek Weir	1	P
35 Kateel River Weir	1,2	P
23 Clear Creek weir	1,2	O
59 Tozitna weir	1,2	O
14 East Fork Weir, Andreafsky River	4,1,2	O

1.2 Assess abundance in season (run timing and relative abundance – test fishing)

1.2.1 Estimate or index abundance

93 Yukon Chinook mark-recapture	1	O
94 Yukon fall chum mark-recapture	3	O
132 Chinook test fishery – Dawson	1	O
18 Marshall, drift gillnet test fishing	1	P
131 Chum salmon test fishing in live captive fish wheel	3	O
160 Chum tagging test fishery - Porcupine River	3	O
1 Rampart-Rapids fall CPUE video monitoring	3	O
10 Hooper Bay subsistence fishing monitor	1,2	S
29 Tanana River fish wheel test fishing (Nenana wheel)	3,4	S
30 Tanana River tagging	3,4	O
13 Mountain Village drift gillnet test fishing	3,4	S
28 Tanana Village south bank fall season fish wheel test fishery	1,2	O
11 Lower Yukon River set gillnet test fishing	1,2	O
12 Lower Yukon River drift test fishing	1,2,3,4	O
15 Yukon River sonar	1,2,3,4	O
50 Rampart Rapids tagging study	3	O
54 Kantishna River tributary assessment	3	O
51 Rampart Rapids summer CPUE video monitoring	1,2	O
80 DFO commercial catch monitoring	1,3,4	O
45 Kaltag Village Drift Gillnet Test Fisheries	3,4	O

1.2.2 Estimate CMU composition of abundance

17 Yukon River Chinook salmon tagging and telemetry study	1	S
177 Aerial Telemetry Survey - L. Stewart, Pelly Systems	1	S

	Species	Status
178 Chinook telemetry - Canadian Section YR Basin	1	S
41 Radio tag recovery, Lower Yukon River	1	S
156 Chinook radio tracking/telemetry pilot project (VGFN)	1	S
16 Lower Yukon chum salmon, genetic sampling	2,3	O
34 Upper Yukon River chum salmon genetic stock identification	3	O
179 MHC variation and stock ID of YR chum salmon	3,2	S
44 Chinook Salmon Capture for Radio Telemetry Study	1	S
49 Aerial Survey for Radio Telemetry Study	1	S
69 Phenotypic Identification of Chinook Salmon Stocks	1	S
78 Upper Yukon R. and Porcupine R. Chinook radio tag tracking	1	S
79 Chinook Radio Tag Tracking	1	S
184 GSI Laboratory	3,1,2	O
1.2.3 Estimate characteristics of run timing (Age comp, stock ID)		
8 Yukon River salmon stock identification	1	S
93 Yukon Chinook mark-recapture	1	O
94 Yukon chum mark-recapture	3	O
132 Chinook test fishery – Dawson	1	O
16 Lower Yukon River chum salmon, genetic sampling	2,3	O
228 Chum test fishery – Dawson	3	O
160 Chum tagging test fishery - Porcupine River	3	O
11 Lower Yukon River set gillnet test fishing	1,2	O
12 Lower Yukon River drift test fishing	1,2,3,4	O
47 Middle Yukon River Chinook Sampling Project	1	O
69 Phenotypic Identification of Chinook Salmon Stocks	1	S
118 Klondike River Sampling & Redd Mapping	1	O
131 Chum salmon test fishery in live capture fish wheels	3	O
45 Kaltag Test Fishery	3,4	O
25 Chandalar River Sonar	3	O
79 Chinook Radio Tag Tracking	1	S
1.3 Establish management objectives		
1.3.1 Establish escapement goals and/or reference points by CMU		
93 Yukon Chinook mark-recapture	1	O
94 Yukon fall chum mark-recapture	3	O
19 Anvik River sonar	2	O
25 Chandalar River sonar	3	O
26 Sheenjek River sonar	3	O
20 Kaltag Creek tower	1,2	O
21 Nulato weir	1,2	P
22 Gisasa River weir	1,2	O
2 Salcha River Chinook and chum salmon tower	1,2	O
3 Chena River Chinook/chum salmon counting tower	1,2	O
14 East Fork Andreafsky River weir	4,1,2	O
15 Yukon River sonar	2	O
23 Clear Creek weir	1,2	O

	Species	Status
24 Henshaw Creek weir	1,2	O
30 Tanana River tagging	3,4	O
32 Toklat River ground survey	3,4	O
50 Rampart Rapids tagging study	3	O
54 Kantishna River mark-recapture	3	O
74 Fishing Branch Weir	3,4	O
73 Yukon River panel meetings	1,2,3,4	O
72 JTC meetings	1,2,3,4	O
1.3.2 Define CMU		
1.3.3 Identify CMUs		
184 GSI Laboratory	3,1,2	O
179 MHC variation and stock ID of YR chum salmon	3,2	S
34 Upper Yukon River Chum Salmon Genetic Stock Identification	3	O
1.3.4 Establish or improve harvest strategies		
183 Chum Fishery Substitution	3	O
46 Eagle Substitution Project	3	O
1.3.5 Establish rebuilding plans as necessary (short-term, part of rebuilding strategy)		
46 and 183 Fisheries substitution Projects	1,3	O
73 Yukon River panel meetings- communication subcommittee	1,2,3,4	O
72 JTC meetings	1,2,3,4	O
1.4 Improve management and research capability		
1.4.1 Improve run assessment capability (mainstem projects)		
132 Chinook test fishery – Dawson	1	O
17 Yukon River Chinook salmon tagging and telemetry study	1	S
178 Chinook telemetry - Canadian Section YR Basin	1	S
179 MHC variation and stock ID of YR chum salmon	3,2	S
131Chum salmon test fishery in live capture fishwheels	3	O
160 Chum tagging test fishery - Porcupine River	3	O
34 Upper Yukon River chum salmon genetic stock identification	3	O
50 Rampart Rapids tagging study	3	O
29 Tanana River fish wheel test fishing	3,4	O
58 Border sonar feasibility	1,3,4	O
15 Yukon River sonar	1,2,3,4	O
44 Chinook Salmon Capture for Radio Telemetry Study	1	S
49 Aerial Survey for Radio Telemetry Study	1	S
51 Rampart Rapids summer CPUE video monitoring	1,2	O
1 Rampart-Rapids fall catch-per-unit-effort video monitoring	3	O
78 Upper Yukon R. and Porcupine R. Chinook radio tag tracking	1	S
79 Chinook Radio Tag Tracking	1	S
146 Teslin River Chinook spawning location	1	P
184 GSI Laboratory	3,1,2	O

	Species	Status
52 Abundance and handling mortality of fall chum salmon in the Yukon River above the Tanana River	3	S
216 CRE-55-04 Upper Nordenskiold River Stewardship	1	O
1.4.2 Improve escapement assessment capability		
127 Radio tag recovery, Tr'ondek Hwech'in FN Trad. Terr.	1	S
156 Chinook radio tracking/telemetry pilot project (VGFN)	1	S
165 Blind Creek Chinook salmon enumeration weir	1	O
171 Telemetry Tracking Chinook KFN TT and weir feasibility	1	S
177 Aerial Telemetry Survey - L. Stewart, Pelly Systems	1	S
178 Chinook telemetry - Canadian Section YR Basin	1	S
159 Stewart River weir feasibility study	1	P
161 Chum spawning ground recoveries – Minto Canada	3	O
58 Border Sonar Feasibility	1,3,4	O
1.4.3 Investigate new technology, methods and models		
52 Abundance and handling mortality of fall chum salmon in the Yukon River above the Tanana River	3	S
55 Ichthyophonus **feasibility study**	1	S
175 Commercial fish plant upgrades value added proc	1,3	S
58 Border Sonar	1,3...	O
1.4.4 Investigate harvesting methods		
91 DFO Yukon conservation catch card	1, 3	O
1.4.5 Improve forecasting ability		
1.5 Monitor harvest (by CMU)		
1.5.1 Estimate harvest by fishery		
4 Commercial catch and effort assessment (fish tickets or processors' reports)	1,2,3,4	O
6 Subsistence and personal use catch and effort assessment	1,2,3,4	O
7 Sport catch, harvest and effort assessment	1,2,3,4	O
80 DFO commercial catch monitoring	1,3,4	O
81 Yukon FN catch monitoring	1,3,4	O
91 D FO Yukon conservation catch card	1,3,4	O
63 Interception of Salmon in Marine Trawl Fisheries	1,2,3,4	S
57 Scale Pattern Analysis (SPA - Chinook)	1	O
5 Commercial Catch Sampling and Monitoring	1,2,3,4	O
1.5.2 Estimate the stock biological or other composition of harvest		
8 Yukon River salmon stock identification (GSI)	1	S
47 Middle Yukon River Chinook salmon sampling project	1	O
57 Scale Pattern Analysis (SPA - Chinook)	1	O
82 DFO commercial harvest sampling	1,3,4	O
90 Yukon FN catch sampling	1,3,4	O

	Species	Status
179 MHC variation and stock ID of YR chum salmon	3,2	S
5 Commercial catch sampling and monitoring	1,2,3,4	O
1.6 Maintain and improve harvest management consultation		
1.6.1 Improve drainagewide consultation (US/Canada coordinating management plans)		
42 Inseason management teleconferences	1,2,3,4	O
73 Yukon River panel meetings	1,2,3,4	O
92 Inseason fishery updates	1,3,4	O
96 DFO/YSC community consultations	1,3,4	O
48 Yukon River Educational Exchanges	1,2,3,4	O
1.6.2 Coordinate management plans		
73 Yukon River panel meetings	1,2,3,4	O
92 Inseason fishery updates	1,3,4	O
72 JTC meetings	1,2,3,4	O
42 Inseason management teleconferences	1,2,3,4	O
1.7 Investigate and implement precautionary management		
1.7.1 Assess limitations of management tools		
1.7.2 Incorporate uncertainty into decision making		
1.7.3 Define precautionary approach		
2. Assess, conserve and restore salmon habitats		
2.1 Identify, characterize and catalog salmon habitats		
2.1.1 ...Identify important features of habitat		
126 Juvenile Chinook and chum salmon outmigration timing and characteristics	1	O
39 Salmon production habitat assessment in the Yukon River drainage	1,2,3,4	O
61 Southside Tanana/Delta Creek Salmon Habitat Survey	1,4	O
62 Seventy-Mile River Chum Salmon Spawner Survey	3,4	O
66 Survey and Reclamation of Salmon Streams – Using Traditional Ecological Knowledge to Identify Streams for Inclusion into the Anadromous Waters Catalog	1,2,3,4	O
67 Andreafsky River Juvenile Salmon Study	1,4	O
63 Interception of Salmon in Marine Trawl Fisheries	1,2,3,4	S
186 Juvenile salmon studies, Lower Yukon R, marine freshwater interface, all species	1,2,3,4	O
187 Chena River juvenile Chinook overwintering study	1	P
189 Fish Distribution System	1,2,3,4	O
193 Fish Information Summary System	1,2,3,4	O

	Species	Status
2.1.2 ...Develop habitat assessment protocols		
2.1.3 ...Define boundaries of use over time		
126 Juvenile Chinook and chum salmon outmigration timing and characteristics	1	O
127 Radio Tag Recovery, Tr'ondek Hwech'in FN Trad. Terr.	1	S
156 Chinook radio tracking/telemetry pilot project	1	S
171 Telemetry Tracking Chinook KFN TT and weir feasibility	1	S
177 Aerial Telemetry Survey - L. Stewart, Pelly Systems	1	S
170 CRE-59-03 Beaver Mgmt - chum spawning sloughs Kluane	3	O
164 CRE-35-03 Klusha Creek and Tatchun Creek Beaver Management	3	O
63 Interception of Salmon in Marine Trawl Fisheries	1,2,3,4	S
64 Interactions Between Wild Yukon River Chum Salmon and Hatchery Salmon Relative to Growth and Survival	2,3	O
143 Chum spawning sites - upper Teslin River	3	O
166 Compilation and mapping fisheries data	1,3	O
36 Chum salmon spawning & freshwater ecology & habitat:	3	O
187 Chena River juvenile Chinook overwintering study	1	P
186 Juvenile salmon studies, Lower Yukon R, marine freshwater interface, all species	1,2,3,4	O
189 FDS	1,2,3,4	O
193 FISS	1,2,3,4	O
170 CRE-59-03 Beaver Mngmt - Chum Spawning Sloughs - Kluane	3	O
214 Teslin River Sub-basin Stewardship	1,3	O
148 McClintock River Watershed Salmon Management Plan	1	O
216 Upper Nordenskiold River Stewardship	1	O
2.1.4 ...Develop models of habitat suitability and use		
145 Teslin River watershed salmon information gathering	1,3	P
209 CRE-14N-04 Juvenile Chinook Migration Patterns – Prel. Assess...		
2.2 Minimize future impacts to habitat		
2.2.1 Identify activities with potential to impact habitat		
158 CRE-23-03 McQuesten River water quality monitoring	1	O
162 CRE-33-03 Big Creek investigations	1,3	P
174 CRE-71-03 Dev of Fisheries Mngmt Plan City of Whitehorse	1	O
180 CRE-114-03 Yukon Queen II investigations	1,3	S
2.2.2 Identify and promote opportunities to develop more effective regulations		
174 CRE-71-03 Dev of Fisheries Mngmt Plan City of Whitehorse	1	O
2.2.3 Identify and participate in available planning processes		
73 Yukon River panel meetings	1,2,3,4	O
97 Yukon River Panel R&E strategic planning	1,3,4	O
163 CRE-34N-03 LSCFN Salmon Habitat Surveys	1	O

Species Status

2.2.4 Assess regulations with the potential to affect habitat

2.3 Identify and implement restoration opportunities

2.3.1 Identify negatively affected habitats

97 Yukon River Panel R&E strategic planning ..... 1,3,4 O

158 CRE-23-03 McQuesten River water quality monitoring ..... 1 O
174 CRE-71-03 Dev of Fisheries Mngmt Plan City of Whitehorse ..... 1 O
62 Seventy-Mile River Chum Salmon Spawner Survey ..... 3,4 O
137 Pelly River tributary Chinook habitat and use survey ..... 1 O
144 Preliminary assessment of Chinook salmon incubation/distribution Swift River B.C. ..... 1 P
166 Compilation and mapping fisheries data ..... 1,3 O
214 Teslin River Sub-basin Stewardship ..... 1 O

2.3.2 Develop, evaluate and implement restoration plans

85 Whitehorse Rapids Hatchery ..... 1 O
73 Yukon River panel meetings ..... 1,2,3,4 O
97 Yukon River Panel R&E strategic planning ..... 1,3,4 O
183 Chum Fishery Substitution ..... 3 O
157 CRE-19N-03 Lower Mayo River Fisheries and Channel Assessment ..... 1 O
37 Chatanika River Dam Removal ..... 1,2,3,4 P
60 Survey and Reclamation of Salmon Streams - Chatanika River Stock Monitoring ..... 1,2 O
46 Project to enhance mainstem salmon escapement ..... 3 O
102 TEK collection and compilation of data from upper Teslin Lake tributaries ..... 1,3 P
113 Klusha creek Habitat Monitoring Program ..... 1 O
114 Restoration Fish Passage/Highway Culverts ..... 1 O
115 Salmon Research Training & Coho/Chinook Hab. Asses. ..... 1,4 O
138 Mica Creek salmon habitat monitoring and restoration ..... 1 O
120 Chinook Salmon Habitat Assessment–Pelly Lakes Region ..... 1 P
121 Inventory Chinook Habitat – Tincup Creek Drainage ..... 1 P
122 Beaver Management – Deadman Creek ..... 1 P
123 Beaver Mitigation – Swift River ..... 1 P
124 Wolf Creek Restoration and Enhancement Project ..... 1 P
129 First Fish 2002, youth camp ..... 1,3 P
130 Coal Creek stream study-spawning/rearing ..... 1 P
134 McQuesten River watershed assessment-restoration plan ..... 1 O
141 Hess River spawning area assessment ..... 1 P
143 Chum spawning sites - upper Teslin River ..... 3 O
147 Teslin Tributary beaver management ..... 1 O
148 McClintock River watershed salmon management plan ..... 1 O
149 Upper Takhini River restoration plan and Chinook investigations ... 1 O
152 Conserve - Restore Chinook habitat, Tincup Creek ..... 1 P

	Species	Status
153 Chinook utilization of upper White River watershed	1	P
167 Salmon Planning White River TT	1,3	S
172 Wolf Creek Monitoring	1	O
215 McClintock River Watershed Sal. Management Plan	1	O
216 Upper Nordenskiold River Stewardship	1	O
145 Teslin River Watershed information gathering	1,3	P
211 CRE-19-04 Lower Mayo River Fisheries R&E – Phase 2	1	O
220 CRE-87-04 Germaine Creek Restoration Assessment	1	O
216 Upper Nordenskiold River Stewardship	1	O

2.3.3 Develop and evaluate restoration techniques

60 Survey and Reclamation of Salmon Streams - Chatanika River Stock Monitoring	1,2	O
85 Whitehorse Rapids Hatchery	1	O
86 Whitehorse Rapids hatchery coded wire tagging	1	O
87 MacIntyre incubation box	1	O
88 MacIntyre Creek coded wire tagging	1	O
89 Mayo Area Pilot Incubation Projects	1	P
100 DFO disease sampling/screening	1,3,4	O
157 CRE-19N-03 Lower Mayo River Fisheries and Channel Assessment	1	O
180 CRE-114-03 Yukon Queen II investigations	1,3	S
109 Feasibility Study – Measurement Suspended Solids	1,3	P
114 Restoration Fish Passage/Highway Culverts	1	O
117 Wolf Creek Riparian Re-vegetation & Mine Reclamation	1	P
125 Ibex River Enhancement	1	P
119 McQueston River Logjam Diversion Completion	1	S
128 Klondike - incubation/outplanting facility feasibility	1	O
136 Lower Stewart River habitat classification and mpg. Pilot	1,3	P
139 Groundwater ID and investigating - Upper Yukon R.	1,3	P
155 Develop protocol restore fish habitat in placer mining streams	1,3	P
144 Preliminary assessment of Chinook salmon incubation/distribution Swift River B.C.	1	P
211 CRE-19-04 Lower Mayo River Fisheries R&E – Phase 2	1	O
218 CRE-65-04 McIntyre Creek Salmon Incubation Project	1	O
220 CRE-87-04 Germaine Creek Restoration Assessment	1	O

3 Build and maintain public support of, and meaningful participation in, salmon resource management

3.1 Develop mutual understandings between agencies and the public

3.1.1 Promote understanding and participation in the development of management plans, methods and strategies

42 Inseason management teleconferences	1,2,3,4	O
36 Canada/Yukon River salmon information and education program	1,2,3,4	O
40 Public policy program support --- annual meeting support	1,2,3,4	O

	Species	Status
73 Yukon River panel meeting-Communication Subcommittee	1,2,3,4	O
96 DFO/YSC community consultations	1,3,4	O
111 Pelly Salmon Information Workshop	1,3	P
112 Carmacks Salmon Information Workshop	1,3	P
190 Board of Fish Advisory Committees AC	1,2,3,4	O
191 OSM RACs	1,2,3,4	O
72 JTC meetings	1,2,3,4	O
210 CRE-15-04 Juvenile Chinook/Coho Habitat Assessment	1,4	O
223 CRE-98-04 Yukon Stewardship Program	1,2,3,4	O
163 CRE 34N-03 LSCFN Salmon Habitat Surveys	1	P
3.1.2 Develop inclusive communication strategy		
73 Yukon River Panel-Communications Subcommittee	1,2,3,4	O
48 Yukon River Educational Exchanges	1,2,3,4	O
96 DFO/YSC communications and consultation	1,2,3,4	O
3.1.3 Document and utilize traditional and local knowledge following protocols		
38 TEK -Interview elders regarding Traditional Ecological Knowledge of salmon species	1,2,3,4	S
133 Traditional/Local knowledge salmon survey (VGFN)	1,3,4	P
169 Traditional/Local knowledge salmon survey –Kluane	1,3	P
102 Compilation of TEK and Scientific knowledge in Teslin Area	1,3	P
103 Hutshi Lake/upper Nordenskiold Chinook utilization and Restoration study	1	O
105 Compilation of existing TEK/scientific data for upper Pelly R.	1,3	P
111 Pelly Salmon Information Workshop	1,3	P
112 Carmacks Salmon Information Workshop	1,3	P
194 Local and Traditional knowledge - Mayo Area	1,3	P
195 YRDFA TEK Project	1,2,3,4	P
221 CRE-93N-04 Salmon Info Workshop Ta'an Kwach'an TT	1,3	P
3.1.4 Educate the public on agency missions and mandates		
73 Yukon River panel meetings	1,2,3,4	O
92 Inseason fishery updates	1,3,4	O
96 DFO/YSC community consultations	1,3,4	O
98 Salmon in the classroom	1,3	O
162 CRE-33-03 Big Creek investigations	1,3	P
111 Pelly Salmon Information Workshop	1,3	P
112 Carmacks Salmon Information Workshop	1,3	P
181 Yukon Fisheries Field Assistant program	1,3	O
190 Board of Fish Advisory Committees	1,2,3,4	O
191 OSM RACs	1,2,3,4	O
192Yukon RRCs	1,2,3,4	O
196 YRDFA Annual meetings	1,2,3,4	O
219 CRE-67-04 Yukon Schools Fry Releases & Habitat studies	1,3	O
223 CRE 98-04 Yukon Stewardship Program	1,2,3,4	O

	Species	Status
3.2 Build and maintain community capacity		
3.2.1 Utilize capabilities of communities		
41 Radio tag recovery, Lower Yukon River	1	S
81 Yukon FN catch monitoring	1,3,4	O
90 Yukon FN catch sampling	1,3,4	O
87 MacIntyre incubation box	1	O
88 MacIntyre Creek coded wire tagging	1	O
89 Mayo Area Pilot Incubation Projects	1	P
127 Radio Tag Recovery, Tr'ondek Hwech'in FN Trad. Terr.	1	S
161 Chum spawning ground recoveries – Minto Canada	3	O
171 Telemetry Tracking Chinook KFN TT and weir feasibility	1	O
169 Traditional/Local knowledge salmon survey –Kluane	1,3	P
164 CRE-35-03 Klusha Creek and Tatchun Creek Beaver Management	1	O
110 Chum Spawning Ground Recoveries/Educ & Stewardship	1,3	O
223 Yukon Stewardship Program	1,2,3,4	O
164 CRE-35-03 Klusha Creek & Tatchun Creek Beaver Mngmnt.	1	P
3.2.2 Identify capabilities and needs of communities		
197 HCSP	1,2,3,4	P
182 Yukon Stewardship Program	1,2,3,4	O
96 DFO/YSC community consultations	1,2,3,4	O
190 Board of Fish Advisory Committees	1,2,3,4	O
191 OSM RACs	1,2,3,4	O
192 Yukon RRCs	1,2,3,4	O
196 YRDFA Annual Meetings	1,2,3,4	O
198 Partners Program	1,2,3,4	O
221 CRE-93N-04 Salmon Info Workshop Ta'an Kwach'an TT	1,3	P
3.2.3 Increase capabilities of communities		
175 Commercial fish plant upgrades value added proc	1,3	S
176 Commercial salmon fishery feasibility study	1,3	S
157 CRE-19N-03 Lower Mayo River Fisheries and Channel Assessment	1	O
163 CRE-34-03 Little Salmon Carmacks FN salmon habitat surveys	1	O
164 CRE-35-03 Klusha Creek and Tatchun Creek Beaver Management	1	O
70 Youth Opportunity - sample taking training	1,2,3,4	O
71 Tribal Civilian Community Corps-fisheries biology training	1,2,3,4	O
56 YRDFA, biotechnician training	1,2,3,4	O
106 Augmentation of R&E program through training of personnel	1	P
107 Augmentation of R&E program through training of personnel	1,3	P
108 Training of personnel	1,3	O
110 Chum Spawning Ground Recoveries/Educ & Stewardship	1,3	O
113 Klusha creek Habitat Monitoring Program	1	O
115 Salmon Research Training & Coho/Chinook Hab. Asses.	1,4	O
116 Snag Creek Inventory & Assessment – Training Project	1	P
128 Klondike - incubation/outplanting facility feasibility	1	O
129 First Fish 2002, youth camp	1,3	O

Appendix C Table 2 (Page 12 of 15)

	Species	Status
140 Carmacks watershed camp	1,3	O
152 Conserve - Restore Chinook habitat, Tincup Creek	1	P
147 Teslin Tributary beaver management	1	O
181 Yukon Fisheries Field Assistant Program	1,3,4	P
166 Compilation and mapping fisheries data	1,3	O
167 Salmon Planning White River TT	1,3	S
168 Kluane River chum freshwater ecology	3	P
172 Wolf Creek Monitoring	1	O
198 Partners Program USFWS	1,2,3,4	O
197 HCSP	1,2,3,4	P
223 Yukon Stewardship Program	1,2,3,4	O
193 FISS	1,3,4..	O
189 Fish Distribution System Anadromous Catalogue	1,2,3,4	O
200 Andreafsky Science Camp	1,2,4..	O
210 CRE-15-04 Juvenile Chinook/Coho Habitat Assessment	1,4	O
211 CRE-19-04 Lower Mayo River Fisheries R&E – Phase 2	1..	O
164 CRE-35-03 Klusha Creek & Tatchun Creek Beaver Mngmnt.	1..	P
218 CRE-65-04 McIntyre Creek Salmon Incubation Project	1..	O
220 CRE-87-04 Germaine Creek Restoration Assessment	1..	O
154 CRE 68-02 FN's Fisheries technician and stewardship capacity building course development	1,3,4	P
214 Teslin River Sub-basin Stewardship	1..	O

3.3 Encourage stewardship of the resource

3.3.1 Educate industries with impact potential

180 CRE-114-03 Yukon Queen II investigations	1,3	S
182 CRE-149N-03 Yukon Stewardship Program	1,3,4	O
114 Restoration Fish Passage/Highway Culverts	1	O
189 Fish Distribution System – Anadromous Stream Catalogue	1,2,3,4	O
197 HCSP	1,2,3,4	P
157 Lower Mayo River Salmon restoration	1	O
199 Germaine Creek	1	O

3.3.2 Participate in planning initiatives

182 CRE-149N-03 Yukon Stewardship Program	1,3,4	O
188 Federal Contaminated Sites Action Plan CDN	1,3	O
197 HCSP	1,2,3,4	P
148 McClintock River watershed salmon management plan	1	O
216 Upper Nordenskiold River Stewardship	1	O

3.3.3 Recognize and promote responsible use of the resource

98 Salmon in the classroom	1,3	O
96 DFO/YSC community consultations	1,3,4	O
182 CRE-149N-03 Yukon Stewardship Program	1,3,4	O

48 Yukon River Educational Exchanges	1,2,3,4	O
129 First Fish, youth camp	1,3	O
135 Salmon habitat signs at Fraser Falls	1	P
140 Carmacks watershed camp	1,3	O
142 Salmon rearing stream signage	1	P
73 Yukon River panel meetings	1,2,3,4	O
190 Board of Fish Advisory Committees	1,2,3,4	O
191 OSM RACs	1,2,3,4	O
192 Yukon RRCs	1,2,3,4	O
196YRDFA Annual Meetings	1,2,3,4	O
189 Fish Distribution System	1,2,3,4	O
197 HCSP	1,2,3,4	P
200 Andreafsky Science Camp	1,2,4	O

3.4 Promote public values of the salmon resource

3.4.1 Educate public on the values of salmon and salmon habitat

51 Rampart Rapids summer CPUE video monitoring	1	O
96 DFO/YSC community consultations	1,3,4	O
98 Salmon in the classroom	1,3	O
173 CRE-67-03 Yukon Schools fry releases and habitat studies	1,3	O
48 Yukon River Educational Exchanges	1,2,3,4	O
129 First Fish 2002, youth camp	1,3	O
140 Carmacks watershed camp	1,3	O
142 Salmon rearing stream signage	1	P
181 Yukon Fisheries Field Assistant program	1,3,4	O
135 Fraser Falls	1	P
200 Andreafsky Science Camp	1,2,4	O
196 YRDFA Annual Meetings	1,2,3,4	O
218 CRE-65-04 McIntyre Creek salmon incubation project	1,3	O
219 CRE-67-04Yukon Schools Fry Releases & Habitat studies	1,3	O
223 CRE-98-04 Yukon Stewardship Program	1,3,4	O

3.4.2 Document cultural values of salmon resources by

38 Interview elders regarding TEK of salmon species	1,2,3,4	S
133 Traditional/Local knowledge salmon survey (VGFN)	1,3,4	P
169 Traditional/Local knowledge salmon survey –Kluane	1,3	P
66 Survey and Reclamation of Salmon Streams – Using Traditional Ecological Knowledge to Identify Streams for Inclusion into the Anadromous Waters Catalog	1,2,3,4	O
102 Compilation of TEK and Scientific knowledge in Teslin area	1,3	P
105 Compilation of existing TEK/scientific data for upper Pelly R.	1,3	P
195 YRDFA TEK Project	1,2,3,4	P
223 Yukon Stewardship	1,2,3,4	O
197 HCSP	1,2,3,4	P
221 CRE-93N-04 Salmon Info Workshop Ta'an Kwach'an TT	1,3	P

3.4.3 Identify values of salmon and opportunities to increase that value

	Species	Status
175 Commercial fish plant upgrades value added proc	1,3	S
176 Commercial salmon fishery feasibility study	1,3	S
4.0 Improve understanding of salmon biology and ecology		
4.1 ..Investigate relationships between salmon and their physical environment		
4.1.1 ...Assess the influence of environment on productivity		
53 Sex ratios of juvenile & adult Chinook salmon in Kuskokwim and Yukon Rivers	1	S
86 Whitehorse Rapids hatchery coded wire tagging	1	O
126 Juvenile Chinook and chum salmon outmigration timing and characteristics	1,3	O
65 Ocean Carrying Capacity Juvenile Salmon Survey	1,2,3,4	S
118 Klondike River Sampling & Redd Mapping	1	O
148 McClintock River watershed salmon management plan	1	O
150 Beaver dams upwelling ground water, chum salmon	3	P
151 Investigation spawning chum - Kluane Lake	3	O
168 Kluane River chum freshwater ecology	3	P
187 Chena River juvenile Chinook overwintering study	1	P
201 Yukon River Tributaries juvenile Chinook salmon utilization	1	P
202 Croucher Creek juvenile Chinook salmon studies	1	O
203 Overwinter ecology of juvenile Chinook salmon	1	P
204 Streambed profiling and the importance of large woody debris for juvenile Chinook habitat	1	P
61 Southside Tanana/Delta Creek Salmon Habitat Survey	4	P
60 Survey and reclamation salmon streams Chatanika River stock monitoring	1	O
62 Seventy mile chum salmon spawner survey	3	O
67 Andreafsky juvenile salmon study	1,4	S
205 Affects of suspended sediments on food webs of juvenile Chinook salmon	1	P
1.1.2 Assess the influence of salmon on environment		
1.1.3 Describe contaminant dynamics		
99 Yukon contaminants program	1,3,4	O
158 CRE-23-03 McQuesten River water quality monitoring	1	O
188 Federal Contaminated Sites Action Plan CDN	1,3	O
206 Contaminants Study	1,2,3,4	O
207 Yukon River Intertribal Watershed Council	1,2,3,4	O
208 Characterization of food web structure and organochlorine accumulation in lakes in the Yukon	1	P
4.2 Investigate relationships between salmon and other organisms		
4.2.1 Evaluate impacts of disease and parasites		
53 Influence of *Ichthyophonus* infection on increased mortality in Yukon River Chinook salmon	1	S
55 *Ichthyophonus* feasibility study	1,2,3	O

	Species	Status
100 DFO disease sampling/screening	1,3,4	O
77 Escapement Sampling	1,3,4	O
4.2.2 Assess and monitor ecosystem structure and health		
99 Yukon contaminants program	1,3,4	O
208 Characterization of food web structure and organochlorine accumulation in lakes in the Yukon	1	P
148 McClintock River Watershed salmon management plan	1	O
103 Hutshi Lake/upper Nordenskiold Chinook utilization and restoration study	1	O
4.2.3 Investigate effects of competition		
86 Whitehorse Rapids hatchery coded wire tagging	1	O
64 Interactions Between Wild Yukon River Chum Salmon and Hatchery Salmon Relative to Growth and Survival	2,3	S
148 McClintock River watershed salmon management plan	1	O
4.2.4 Determine predator-prey relationships