

**YUKON RIVER JOINT
TECHNICAL COMMITTEE REPORT**

**A SYNOPSIS OF THE YUKON RIVER SALMON
AGREEMENT, PLANS, POLICIES AND
PROTOCOLS RELEVANT TO SALMON
RESEARCH IN THE YUKON RIVER DRAINAGE, 2002**

YUKON JTC (02)-1

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LIST OF ACRONYMS

ADF&G	Alaska Department of Fish and Game
AVCP	Association of Village Council Presidents
BLM	Bureau of Land Management
BSFA	Bering Sea Fishermen’s Association
DFO	Department of Fisheries and Oceans Canada
NMFS	National Marine Fisheries Service
NPS	National Park Service
TCC	Tanana Chiefs Conference
USFWS	U.S. Fish and Wildlife Service
USGS-BRD	U.S. Geological Survey – Biological Resources Division
YR DFA	Yukon River Drainage Fishermen’s Association

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PREFACE

The Yukon River Salmon Agreement recognizes the desire of both the United States and Canada to cooperate in the research of Yukon River salmon stocks and their habitat. In response to this agreement, and various governing plans and policies seeking to maintain and restore sustainable salmon fisheries in the Yukon River, the Joint Technical Committee (JTC) of the Yukon River Panel met in Anchorage on February 21, 2002 to initiate the development of a strategic research plan for salmon in the Yukon River drainage. A working draft of the strategic research plan will be presented to the Yukon River Panel in fall, 2002.

The strategic research plan will be the first basin-wide effort to include all aspects of research including but not limited to restoration and enhancement. This plan will build upon foundations of historical plans developed to address limited research topics or confined to the Alaskan portion of the Yukon River basin, and is subject to the mandates of over-arching plans, policies and protocols of both countries. Opportunities exist for cooperative effort and communication with corollary plans, such as those directing salmon research programs in the Bering Sea.

With these opportunities in mind, a summarization of historical plans and governing plans, policies and protocols was undertaken. This synopsis includes 22 documents totaling more than 650 pages that have been identified to date as relevant to planning for cooperative salmon research in the Yukon River drainage and constitutes a working draft. This synopsis will assist the JTC to:

- define goals and objectives which must be included in the strategic research plan to meet mandates from governing bodies;
- consider ecological, technological and socioeconomic concepts;
- examine the relevancy of issues including information gaps;
- observe ethical principles when collecting information from indigenous cultures; and,
- identify possible options.

The synopsis can serve as a platform from which to launch creative, collaborative ideas that will be unique to addressing complex salmon research issues in the Yukon River drainage. A great deal of scientific expertise and public comment has been captured in documents summarized in this synopsis. The synopsis serves as a resource to the JTC as it begins the process of learning, listening and adapting to meet the challenges of addressing the problem of maintaining and restoring sustainable salmon fisheries through strategic planning.

INTRODUCTION

Mandated international and regional responsibilities and guidelines from numerous plans and policies add complexity to planning for salmon research in the Yukon River. These documents consist of numerous and varying missions, principles, goals, objectives, research needs and issues that direct or suggest action. Protocols for working with indigenous cultures recommend how research actions involving local communities should be conducted. This synopsis condenses 22 documents identified to date by JTC members as relevant to salmon research in the Yukon River into structured frameworks to assist the JTC in focusing on concepts in the documents and how these concepts may be integrated into a comprehensive, basin-wide strategic research plan.

Organization of the Synopsis

Following a summary of the Yukon River Salmon Agreement, plans and policies are grouped into four geographic areas:

- basin-wide (US and Canada combined);
- the North Pacific and Bering Sea;
- the Alaska sub-basin; and,
- the Canadian sub-basin.

Protocols for the conduct of social science research include broad principles developed by academicians as well as those developed by local tribes or communities, and are grouped in a separate category.

The Yukon River Salmon Agreement, plans and policies are summarized as follows: 1) aim; 2) components; and 3) brief thoughts on how the JTC plan can fill gaps and forge linkages with the Yukon River Salmon Agreement, plan or policy. Authors of the documents summarized in this synopsis used at least 15 different terms to characterize elements of their plan or policy, sometimes inappropriately. To assist the JTC in accurately interpreting these terms, a Glossary is included at the end of the synopsis.

Past, Present and Future

The JTC research plan will develop in the context of past planning efforts, existing plans and policies, and future planning exercises. Three historical plans were identified as pertaining to Yukon salmon research; the fourth historical plan addresses other transboundary rivers, however, research goals and proposed projects have some application to the Yukon River:

1. In 1991 a draft plan for conservation, management and enhancement of Yukon salmon was developed by the Alaska Department of Fish and Game (ADF&G) for the Alaska portion of the basin.
2. In 1997 the Yukon River Panel commissioned an interim strategy to assist in guiding allocation of restoration and enhancement funds.
3. In 1998 a plan was cooperatively developed by ADF&G and the Yukon River Drainage Fishermen's Association (YRDFA) in response to interests for restored and expanded salmon production in the Alaska portion of the drainage. The plan was developed through ADF&G's Regional Planning Team (RPT) process.
4. In 1990 a long-term research plan for the Transboundary Rivers was developed for the Pacific Salmon Commission. These plans identify information needs for management, escapement estimation and goals, preseason forecasting and enhancement in the Stikine, Alsek and Taku rivers.

The three historical Yukon River plans incompletely address basin-wide concerns encompassing all research aspects, and do not account for the recent dramatic declines in salmon stock abundance. Therefore, many issues in these plans remain to be addressed and will serve as helpful reminders to the JTC. Changing conditions over time alter or broaden focus – this is why planning is repetitive.

Keep in mind the five present-day plans, with the Alaska Board of Fisheries (BOF) Action Plans of 2000 perhaps having the greatest bearing on research planning. The ADF&G has notified the BOF that ... “the Yukon River does not have a comprehensive research plan...”, and a research plan may be developed, if applicable, to address several conservation concerns raised during testimony before the BOF. The other four plans cover both ends of the geographic extent of the Yukon River basin, from the Bering Sea to the Canadian headwaters. These plans offer opportunities for the JTC to collaborate through communication, and to integrate through the incorporation of common elements. The five present-day plans identified to date are:

1. In 2000 the BOF was presented with Action Plans by the ADF&G to address yield and conservation concerns in Yukon River salmon stocks. The Action Plans call for research to investigate these concerns.
2. In 2000 the Department of Fisheries and Oceans Canada (DFO) developed a plan to guide the department in restoring confidence and credibility, renewal, and management

improvement. This plan has commendable aims to consider such as teamwork, excellence in service delivery to clients, and providing high-quality scientific advice to decision-makers.

3. In 2001 the Bering-Aleutian Salmon International Survey (BASIS) plan was created to detect and monitor changes in salmon and their ecosystem. This plan integrates with other major marine research programs such as PICES, GLOBEC and POST.
4. In 2001 the North Pacific Marine Research Program (NPMR) developed a research strategy to gain understanding of the system dynamics of the Bering Sea with the aim of predicting ecological response to change and human impacts, including contaminants and large-scale fishing.
5. In 2001 the DFO developed a strategy for sustainable development by integrating economic, environmental and social considerations into the conservation, protection and use of aquatic resources.

In addition to the Yukon River Salmon Agreement, which provides clear mandates to the JTC, seven present-day policies are relevant to research planning. Five of these policies arose in Canada, and most are part of the “New Direction” series being formulated by the government. Public policy is made by a complex, interactive political system comprised of governmental institutions and interest groups. Policy is developed in an attempt to solve problems, or, springs from new opportunities (Lindblom and Woodhouse 1993). By establishing principles, policy directs goals and objectives in plans. Plan participants decide how they will interpret policy. The seven policies identified to date are:

1. In 2000 the Policy for Management of Sustainable Salmon Fisheries was cooperatively developed by the ADF&G and the BOF; it was passed into regulation by the BOF (5AAC 39.222). This policy formed the basis for goals stated in strategic salmon research plans in the Copper River (Merritt 2000), Kuskokwim River (Merritt 2001), Southeast (Merritt and Skilbred 2002) and Cook Inlet. A summary of missions and goals from these plans are found in Appendix A.
2. In 2000 the Policy for Statewide Salmon Escapement Goals (5AAC 39.223) was developed by ADF&G and the BOF to manage for sustained yield by establishing escapement goals.
3. In 2002 Canada developed the Monitoring and Reporting Policy to set standards for fishery monitoring and reporting programs and ensure timely and accurate harvest assessment.
4. In 2001 Canada developed the Precautionary Approach Policy to address risk and manage uncertainty. This policy provides a framework for applying the precautionary approach.

5. In 2001 Canada developed the Selective Fishing Policy to ensure that selective fishing practices and technology are adopted in mixed stock fisheries so that harvest may occur on robust stocks while conserving threatened stocks.
6. In 2000 Canada began development of the Wild Salmon Policy to provide a framework for conserving the genetic diversity of wild salmon and to protect their habitat. This developing policy is still in draft form.
7. In 1986 Canada developed the Management of Fish Habitat Policy to achieve an overall net gain in fish habitat supporting productive fisheries.

Future plans include:

1. Yukon Territory community-based watershed plans, focusing on large tributaries with a restoration and enhancement focus.
2. Yukon Territory sub-basin plans, fed by the community-based plans, focusing on larger geographic areas with a restoration and enhancement focus.
3. A basin-wide restoration and enhancement plan, fed by the Yukon Territory sub-basin plans and Alaska's equivalent, the 1998 RPT Comprehensive Plan.
4. A basin-wide stock rebuilding and restoration plan to be developed by the Yukon River Panel.

The JTC's research plan will be a useful guide to the development of the two basin-wide plans.

Common Elements of the Agreement, Plans and Policies

Of the 10 documents with Mission or Vision statements, the concepts that appeared most frequently were:

- Productivity/production – maintaining, increasing, promoting, and understanding changes in (n = 7)
- Benefits to users (n = 4)
- Conservation/conserve (n = 4)
- Sustainable use/sustained yield (n = 3)
- Providing a clear and consistent framework/scientific foundation (n = 3)

Only the Yukon River Salmon Agreement contained the concept, “cooperative research” at the mission level.

As expected, there was greater diversity and detail in concepts at the goal/principle/guideline level. Eighteen of the most frequently appearing concepts at this level are listed below:

- Habitat/environment – maintain, protect, long term conservation of (n = 9)
- Production – ensure, optimum, increase, productive capacity (n = 8)
- Public support/involvement with stakeholders – cooperate with public, communicate, address community concerns (n = 6)
- Scientific knowledge – effective application, sound scientific information, better (n = 4)
- Conservation – sustainable (n = 4)
- Escapement – define goals, meet goals, allow within ranges, distribution of (n = 4)
- Restore/enhance (n = 4)
- Variability – understand its impacts, dynamic factors, variability in abundance (n = 4)
- Benefits – socioeconomic, sustainable (n = 3)
- Harvest – determine, monitor (n = 3)
- Cost-effective (n = 2)
- Precautionary approach/manage conservatively with uncertainty (n = 2)
- Establish standards (n = 2)
- Evaluate performance (n = 2)
- Accuracy and precision/increase consistency (n = 2)
- Prediction – provide predictability (n = 2)
- Abundance – target levels of, determine in-season (n = 2)
- Coordinate among agencies/integrate decision-making (n = 2)

Unique concepts at the goal/principle/guideline level include: managing risk based on public values, meeting provisions of treaties, reducing interception and bycatch, understanding human influences on salmon and their habitat, and genetic and disease guidelines. Some of these concepts may be more appropriately placed at subsidiary levels.

Objectives, research needs and issues become increasingly specialized in scope in lower levels of the hierarchy. The reader is encouraged to examine each summary for these details. Options listed in historical and present-day plans were not included in the synopsis because either they were outdated, or were not well linked to objectives and goals. Some plans began by listing existing projects and then rationalizing objectives for them. The JTC plan will take a top-down approach, where goals and objectives direct the appropriate options, not the other way around.

Summaries

Yukon River Salmon Agreement

Aim of Treaty

The Yukon Annex to the Pacific Salmon Treaty, referred to as the Yukon River Salmon Agreement, aims to provide the framework for co-operative program management, stock conservation and harvest allocation for salmon. Management, conservation and restoration programs are intended to increase productivity, assess habitat capacity and create awareness for salmon stewardship with the ultimate aim of achieving an overall gain in the number of fish harvested in the future.

Components of Treaty

Mission	To cooperate in the management, research and enhancement of Pacific salmon to: ensure the effective conservation of stocks originating in the Yukon River; and, to identify potential restoration and enhancement opportunities.
Principles	<ul style="list-style-type: none"> Parties shall undertake comprehensive co-operative planning. Prevent overfishing to provide for optimum production. Receive benefits equal to production through harvest shares. Reduce interceptions. Avoid disruption of fisheries. Take into account variations in abundance. Reduce marine catch and bycatch. Maintain water quality standards. Maintain productive capacity of habitat.
JTC shall:	<ul style="list-style-type: none"> Assemble data on migratory patterns. Assemble information on exploitation in fisheries harvesting Yukon origin salmon. Review assessment techniques. Investigate new ways for determining total return and escapement. Recommend optimum escapement objectives. Recommend improvement in management regimes. Identify restoration/enhancement opportunities. Evaluate consequences of restoration/enhancement. Evaluate status of Canadian origin chum and chinook salmon. Investigate new ways to evaluate rebuilding. Investigate stock separation to assist in developing specific fishery management programs. Analyze effectiveness of alternate regulations. Undertake assessments of coho salmon originating in the Yukon River. Assess condition of habitat and measures to be taken to protect or enhance salmon habitat. Analysis of socioeconomic characteristics of the fishery. Compile status of Porcupine salmon and benefits of management.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The intent of Treaty Principles pertaining to research activities should be incorporated into goal statements of the JTC research plan. The JTC “shalls” should be re-stated as objectives within the JTC research plan, with associated research projects or actions to accomplish the objectives.

US/Canada Plans

Yukon River Panel Interim Strategic Plan for the Restoration and Enhancement Fund (dated December 1997)

Aim of Plan

In 1996 monies (hereafter called the “Fund”) for restoration and enhancement of Canadian origin salmon became available from US legislation in accordance with an agreement between the US and Canada. This strategic plan provided initial guidance regarding annual solicitation and review of proposals to the Fund. It called for a Yukon River basin-wide stock rebuilding and restoration plan (yet to be developed by the Panel). Consultations with the public and agencies occurred, however ultimately the contractor chose the preferred approach.

Components of Plan

Goal	To provide for prudent guidance for the management of the R & E Fund process and ultimately to restore the Yukon River salmon stocks of Canadian origin to natural levels.
Principles	Protect wild stock and habitats. Large scale enhancement is inappropriate. Artificial propagation shall not substitute for good management.
Objectives	Effective management of the Fund. Develop guidelines for review of R & E proposals by the JTC, Panel and Public: -Accept educational proposals -Allow agencies to compete for funds -Allow small scale artificial propagation Consult with user groups about the proposal solicitation and review process. Serve as a framework for the development of a long term basin-wide R & E plan.
Issues	Public unfamiliarity with the R & E fund and review process. Lack of public understanding of enhancement techniques. Identification of data needs would clarify which proposals to submit and fund. The Panel should adopt a prioritization process to identify: -Specific salmon stocks -Aquatic habitats -Specific issues requiring immediate attention.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The JTC research plan will provide a prioritized list of data needs, thus clarifying what types of projects should be proposed. The JTC’s development of weighted criteria for judging the preference of projects could be adapted by the Panel in their prioritization process. Through research, “natural levels” can be more specifically defined.

**Long-term Research Plan for the Transboundary Rivers, Pacific Salmon Commission
(dated November 1990)**

Aim of Plan

This plan encourages the Parties to cooperate in the development of research strategies and identifies Treaty-related activities that could benefit from improved information. To manage for total allowable catch and achievement of escapement goals requires preseason forecasts, in-season management, spawning enumeration, development of escapement goals, postseason stock assessment to evaluate management effectiveness, enhancement evaluation and interception estimation. This plan addresses these specific data needs by salmon species and river. The plan aims to provide the Pacific Salmon Commission with a sense of direction, and information to assist agencies in funding research activities.

Components of Plan

Goals	Achieve optimum salmon production. Provide benefits to salmon production originating in each Party’s waters -Produce enough sockeye salmon to increase benefits without adverse effects -Develop methods to maximize enhanced fish harvest and no wild stock overharvest -Identify additional enhancement opportunities
Research Categories	Escapement estimation Catch accounting Escapement goals Enhancement

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

This plan can serve as a reference to prompt ideas for JTC plan participants. Research methods for each research category are listed. For example, methods for catch accounting include coded-wire tagging studies (to estimate exploitation rates, harvest distributions, migratory patterns) and stock identification. Radiotelemetry is used to document run timing and spawner distribution, and to assess the reliability of escapement estimation projects.

North Pacific and Bering Sea Plans

Draft Plan for North Pacific Anadromous Fish Commission Bering-Aleutian Salmon International Survey (BASIS) 2002-2006 (dated October 2001)

Aim of Plan

This plan garners international support to detect and monitor changes in salmon and their ecosystem because stocks from most major wild salmon producing nations are distributed in the Bering Sea. The plan calls for seasonal surveys for 5 years to capture, sample and tag salmon, take plankton tows and measure oceanographic conditions. Samples will yield information on when and where salmon migrate and rear, their growth, life history characteristics, relative abundance of regional stock groups and migration, growth and mortality. This data will be used in models to advance understanding of changes in productivity of salmon populations. BASIS is a 5-year program that complements longer-termed research and monitoring programs by PICES and GLOBEC. Archival tags applied by BASIS will complement the Pacific Ocean Salmon Tracking (POST) study.

Components of Plan

Mission	To provide a scientific foundation by which to determine the causes of changes in productivity of Bering Sea salmon populations.
Goal	To understand the mechanisms underlying the effects of environmental variation and density-dependence on salmon carrying capacity in the Bering Sea for sustainable conservation of salmon stocks.
Objectives	Monitor and evaluate oceanographic and biological factors related to salmon production. Determine the role of salmon in nektonic communities and association to ecosystem. Study links between marine survival, climate, ocean change. Predict the potential impacts of global climate change on marine salmon habitat.
Issues	Declines in size in adults returning to Bering Sea river systems. Reductions in growth rate of Asian salmon rearing in the Bering Sea. Reduced growth and production are mirrored in macroplankton biomass declines. Data are lacking on where Yukon salmon rear during their first year at sea; where they migrate.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The JTC could establish goals/objectives as freshwater counterparts to the marine study on productivity and carrying capacity. Tags applied in either the Yukon River or Bering Sea should be noted and communicated as they are recovered - BASIS will tag fish with both archival tags and external disk tags. The JTC could enter an agreement of coordination of scientific information exchange and participate in planned workshops or seminars.

North Pacific Marine Research Plan (dated November 2001)

Aim of Plan

This plan guides decision makers in directing research to further understand the North Pacific and Bering Sea, thereby hastening the development of predictive ability for ecological responses to natural and human-induced impacts. It is important to understand this region's hydrographic and ecological dynamics to assess the role and effects of long term change.

Components of Plan

Goal	Increase understanding of the Bering Sea and adjacent waters with the aim of developing predictive ability of ecological responses to natural and human-induced impacts for use by coastal communities, resource managers and policy makers.
Research Categories	<p>Characterize climate variability and its influence on the physical environment and ecology.</p> <p>Ecology: a process oriented approach to understand and predict ecosystem change.</p> <p>Understand human-induced influences on the ecology and species harvested.</p> <p>Community-based research concerns and needs.</p> <p>Communication needs.</p>
Research Needs	<p>Under climate: characterize the Bering Sea with monitoring; make regional database accessible; exploit paleoclimatic records.</p> <p>Under ecology:</p> <ul style="list-style-type: none"> -Characterize ecological responses in terms of productivity, population dynamics, physiology, community structure, distribution, trophic/food chain dynamics. -Characterize external, internal, land-sea forces. -Consider research at temporal scales of evolutionary, climatic, generational, seasonal, diurnal. -Consider spatial scales: planetary/hemispheric, basin, regional, meso, habitat, individual. -Research components: microbes, primary producers, invertebrates, fish, birds, marine mammals, community (benthic, pelagic, intertidal). <p>Under human influences:</p> <ul style="list-style-type: none"> -Contaminants: inputs, pathways, impact on structure and function of ecosystem, new sources and effects, integrate various contaminants studies. -Large scale commercial fishing: impacts on benthic and pelagic habitats, bycatch monitoring, effects of fishing on recruitment (incidental capture of juveniles). <p>Under community concerns:</p> <ul style="list-style-type: none"> -Research priorities are not currently based on community concerns; continue/expand existing programs; train locals. <p>Under communication needs:</p> <ul style="list-style-type: none"> -Identify audience; collaborate with other funding programs; research different methods for communicating among stakeholders.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Design corollary ecological research addressing dynamic changes in the riverine environment— causes and impacts. Link communications between the two plans by organizing briefing sessions; invited speakers would attend JTC meetings to share their research findings.

Alaskan Plans and Policy

Alaska Board of Fisheries Action Plans (dated December 2000)

Aim of Plans

In response to guidelines established in the Sustainable Salmon Fisheries Policy the Alaska Board of Fisheries classified Yukon chinook and fall chum salmon stocks as yield concerns based on the inability of management to maintain expected harvestable surpluses in recent years. Yukon summer chum and Toklat fall chum salmon were classified as management concerns based on the chronic inability to meet escapement goals. Three Action Plans offer specific actions to reduce fishing mortality for chinook, summer chum and fall chum salmon, and provide means of informing the public about these actions. The Action Plans call for a comprehensive research plan to identify research needs and all possible means to rebuild stocks.

Components of Plans

Goals	<p>Reduce fishing mortality to meet spawning escapement goals.</p> <p>Provide for subsistence levels within the amount necessary for subsistence (ANS) range.</p> <p>Re-establish historic range of harvest levels by other users.</p>
Objectives	<p>With low forecast, reduce harvest early in run; spread the harvest throughout run, spread subsistence opportunity among users.</p> <p>Reduce chinook salmon harvest by restricting nets to 6 in max to provide escapement while allowing harvest of other species.</p> <p>Reduce harvest of large, older chinook salmon females by limiting max mesh size while allowing fishery to proceed.</p> <p>Manage summer chum salmon based on in-river run goals to insure escapement and give ADF&G management guidelines.</p> <p>With low run projections adjust boundary of Norton Sound to decrease harvest of Yukon summer chum salmon.</p> <p>With low run projections reduce commercial harvest time in Norton Sound to decrease harvest of Yukon summer chum salmon.</p> <p>With low run projections, regulate amounts of fall chum salmon fed to dogs.</p>

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The Action Plans list options in the form of existing projects and projects needed. By using a hierarchical structure, plan objectives addressed by existing projects will be clearly delineated, and issues addressed by new projects will be clearly shown. A priority ranking of projects will help the JTC to see which projects are most important to achieving goals of the Action Plans.

Alaska Yukon Regional Planning Team Comprehensive Plan (dated August 1998)

Aim of Plan

The plan was developed cooperatively between ADF&G and YRDFA in response to interests for restored and expanded salmon production. Large-scale hatchery programs garnered little support so increased salmon production was based on restoring or expanding natural stock production. The aim of the plan is to improve the natural productivity of salmon stocks so that escapement goals, subsistence needs and commercial fishing opportunities are maximized. Estimates of commercial harvest expectations were given based on several assumptions including existing levels of productivity. Because of dramatic run declines since 1998, harvest expectations and thus the plan's implementation strategies are significantly out of date. The plan meets the Commissioner's statutory mandate for salmon planning.

Components of Plan

Mission	Promote, using sound biological practices, activities that increase salmon production in a regional area for maximal social and economic benefits of the users consistent with the public interest.
Principles	<p>Ensure the perpetuation and unique characteristics of wild stock salmon production.</p> <p>Impacts to subsistence fisheries from restoration/enhancement will be reviewed.</p> <p>Habitat manipulation will proceed in a careful, conservative manner.</p> <p>Existing habitat must be maintained to ensure salmon productivity.</p> <p>Information gaps on salmon must be addressed.</p> <p>Large-scale enhancement projects are opposed.</p> <p>Restoration projects shall have priority over enhancement of habitat or fish stocks.</p> <p>Fish mortality will be minimized while conducting studies; donate dead fish to local users.</p> <p>All harvests should be monitored for impacts to salmon production.</p> <p>Strict genetics and disease policies shall apply.</p> <p>The introduction of salmon originating outside of the Yukon drainage is opposed.</p> <p>Production goals shall be consistent with natural habitat capacity.</p> <p>Unforeseen dynamic factors influence production goals.</p>
Objectives	<p>Improve management of existing regional salmon fisheries.</p> <p>Improve preseason projections.</p> <p>Investigate rehabilitation/enhancement opportunities.</p> <p>Improve public education and involvement in conservation and restoration activities.</p>
Issues	<p>Concern from mining, timber harvesting, offshore fishery interceptions.</p> <p>Mismanagement of sonar counts by ADF&G.</p> <p>The need for more comprehensive escapement and management projects.</p> <p>Chinook salmon are of mixed stocks, broad distribution in drainage, compressed entry timing.</p> <p>Timely inseason chinook salmon stock assessment in the lower river is difficult because:</p> <ul style="list-style-type: none"> -Relative small size of chinook salmon return compared to chum salmon -Technical limitations of test fisheries and sonar which reduce reliability. <p>Questions about oceanographic regime shifts and fluctuations in freshwater survival.</p> <p>Aerial survey counts of summer chum are less reliable than for chinook salmon.</p> <p>Genetic discrimination continues to lack resolution on a per-stock basis.</p> <p>Cost effective, timely and accurate stock identification needs still exist.</p>

	<p>Basic life history information for some stocks is not well documented.</p> <p>Dynamic environmental conditions and their impacts on freshwater survival are unclear.</p> <p>Indexed tributaries may not accurately represent escapement within an area.</p> <p>Sources and impacts of water pollution and contaminants; urban development.</p> <p>Illegal activities.</p> <p>Ichthyophonous infestation-cause and cure.</p> <p>Beaver dams blocking access to spawning grounds.</p> <p>Information gap on salmon in the Innoko River.</p> <p>Middle Yukon escapement enumeration projects are sparse.</p>
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How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Issues mentioned in the plan remain to be addressed and await future planning efforts. The plan provides comprehensive historical profiles of fisheries, fish stocks, market trends, and management and research methods.

Draft Strategic Plan for the Conservation, Management and Enhancement of Yukon River Salmon Fisheries in the 1990s (dated 1991)

Aim of Plan

Scientists representing the Alaskan and Canadian fisheries agencies responsible for management of Yukon River salmon resources concluded that the existing fisheries research and monitoring programs in both countries are inadequate to deliver sufficient fish stock allocations to the various user groups. Several factors contribute to this limited ability to meet harvest and escapement goals for some stocks: lack of reliable inseason abundance and migratory timing estimates; inadequate harvest reporting; incomplete assessments of escapement; mixed stock and species fisheries; multiple user groups; immense geographic size; and the need to restore habitat in certain areas. This plan provides a “roadmap” for the growth and direction of salmon research to improve management. The draft plan mistakes objectives for some goals, however these objectives remain important to salmon conservation.

Components of Plan

Mission	Conserve and maintain the health and productivity of Yukon River salmon habitats and stocks on a sustained yield basis. In addition, quality and quantity of critical habitats and the genetic diversity of fish populations must be maintained.
*Goals	<p>Determine the total catch of salmon in river commercial, subsistence, sport fisheries.</p> <p>-Maintain/ improve accuracy and timeliness of catch information.</p> <p>Determine inseason abundance and timing of stocks available for harvest and escapement.</p> <p>-Provide inseason information on abundance/timing in the lower, middle, upper, Tanana.</p> <p>Monitor the distribution and magnitude of escapement for salmon stocks.</p> <p>-Increase monitoring in the lower, middle, upper and Tanana.</p> <p>Collect basic biological and ecological data for salmon stocks.</p> <p>-List habitat requirements for spawning, rearing, migration.</p>

	<p>Support and participate in cooperative efforts with the public.</p> <ul style="list-style-type: none"> -Establish a fisheries management planning process. <p>Improve cooperation/coordination among agencies.</p> <ul style="list-style-type: none"> -Establish formal agreements and commitments. -Coordinate/directly participate in other resource planning activities. <p>Rebuild, restore, enhance stocks while protecting wild salmon and other fisheries resources.</p> <ul style="list-style-type: none"> -Develop a comprehensive regional restoration and enhancement plan. -Continue to develop restoration feasibility work for stocks of conservation concern. -Carefully collect and assess environmental and fisheries data on R & E projects. <p>Provide for the long term conservation and management of salmon habitats.</p> <ul style="list-style-type: none"> -Develop a regional habitat management plan that integrates with fisheries management. -Develop a resource planning process. -Ensure uniform statutes, regulations and policies among agencies. -Develop effective habitat mitigation policy. -Document anadromous fish habitats in the Yukon. -Conduct research to provide information/technology for conservation, restoration. -Initiate funding of habitat restoration and development projects. -Promote public awareness and participation on habitat conservation, restoration. -Augment funding through grants and cost-share programs.
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*Only those elements pertinent to research are given.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

This draft plan is 10 years old; it lists tasks, which are actually options to address objectives. These “tasks” could be reviewed for their current relevancy.

Policy for the Management of Sustainable Salmon Fisheries 5AAC 39.222 (dated March 2000)

Aim of Policy

To effectively assure sustained yield and habitat protection from wild salmon stocks, fishery management plans and programs require specific guiding principles and criteria and a framework for their application, as contained in this policy. The policy consists of four sections: an introduction, principles and criteria, implementation through Action, Research and Fishery Management Plans, and definitions of terms. Action plans shall include research plans as necessary to provide information to address concerns. The research plans shall include options to address salmon stock or habitat concerns. This policy was developed by the BOF and ADF&G.

Components of Policy

Goals	<p>To ensure conservation of salmon and their required marine and aquatic habitats.</p> <p>To ensure protection of customary and traditional uses and other uses.</p> <p>To ensure the sustained economic health of Alaska’s fishing communities.</p>
Principles	<p>Wild salmon and their habitats should be maintained within levels of resource productivity.</p> <ul style="list-style-type: none"> -Spawning, rearing and migratory habitats should be protected. -Salmon within spawning, incubating, rearing, migratory habitats should be protected. -Degraded productivity from habitat loss should be considered when making decisions. -Effects of introduced or enhanced stocks on wild salmon should be assessed. -Restore degraded habitats to natural levels of productivity where desirable. -Monitor current status of habitat and effectiveness of restoration. -Depleted stock should be allowed to recover or actively restored. <p>Manage fisheries to allow escapement within ranges to maintain normal ecosystem.</p> <ul style="list-style-type: none"> -Assess spawning escapements appropriate to scale of each stock’s use. -Establish escapement goals consistent with sustained yield. -Escapement goals ranges should allow for uncertainty. -Manage escapement to maintain genetic and phenotypic characteristics. -Impacts of fishing should be assessed. -Protect non-target stocks in management decision-making. -Role of salmon in ecosystem functioning should be evaluated. -Abundance trends should be monitored. <p>*Establish effective management systems.</p> <ul style="list-style-type: none"> -Assure effective harvest monitoring. -Evaluate the effectiveness of management and habitat protection actions. -Consider the best available information on biological, socioeconomic use factors. -Research should be undertaken to improve science and technical knowledge. -Scientific information should be updated and peer reviewed. <p>*Public support and involvement shall be sought and encouraged.</p> <ul style="list-style-type: none"> -Promote understanding of the proportion of mortality on each stock by user group. <p>With uncertainty, fisheries, artificial propagation, habitats will be managed conservatively.</p> <ul style="list-style-type: none"> -Use a precautionary approach.

* Only objectives pertinent to research are listed.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Previous research plans developed for salmon in Alaska have used the goals and principles in this policy as a template for sustainable salmon planning frameworks (see Merritt 2000, 2001 and Merritt and Skilbred *In review*). In response to guidelines established in this policy, the BOF classified chinook and fall chum salmon as yield concerns and summer chum and Toklat River fall chum salmon as management concerns and requested the development of Action Plans. Using the intent language in this policy as a basis for developing a planning framework for salmon research in the Yukon would forge linkages between the JTC plan and this policy.

Policy for Statewide Salmon Escapement Goals 5AAC 39.223 (dated May 2000)

Aim of Policy

This policy addresses Alaska constitution Section 4, Article 8, which mandates ADF&G to manage on the sustained yield principle. A wide range of sustainable yield levels is possible with salmon fisheries. The ADF&G chooses to manage for maximum sustained yield (MSY) where the scientific information and management program exists. In situations lacking sufficient information, fishery management measures will be adopted to ensure that harvests are sustainable. Scientific information to manage for MSY includes escapement enumeration, estimates of salmon carrying capacity of freshwater rearing environments, and inseason management programs to determine the relationship between the number of spawners resulting in a level of return.

Components of Policy

Purposes	Define concepts relating to escapement goals. Specify criteria and procedures for establishing and modifying escapement goals. Establish a process that facilitates public review.
Guidelines	Analysis supporting a new escapement goal will be developed within the region. An inter-divisional review team will technically evaluate the new escapement goal. If the team finds no significant allocative impacts, the new goal's submitted to the director. If the team does not reach consensus, resolution occurs at the director level. With significant allocative impacts, the BOF is asked to establish an optimal goal. The public will be informed.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The return per spawner relationship based on historic data may no longer hold for some stocks because productivity has recently changed. New return models could be developed to account for varying productivity.

Canadian Plans and Policies

Fisheries and Oceans: Action Plan for Sustainable Development (2001-2003)

Aim of Plan

An international plan for sustainable development was endorsed at the “Earth Summit” at Rio de Janeiro in 1992. Sustainable development became part of Canada’s policy in 1995. Since then, DFO is required to develop plans for sustainable development. DFO is committed to sustainable development and to integrate economic, environmental and social considerations into the conservation, protection and use of aquatic resources.

Components of Plan

Vision	Safe, healthy productive waters and aquatic ecosystems by maintaining high standards of service, marine safety, environmental protection, science, conservation, sustainable resource use.
Principles	Integrated decision-making. Accountability for DFO’s role in supporting sustainable development. Science and knowledge play a critical role in making decisions about sustainable use.
Goals	Sustainable use of resources through new forms of governance and shared stewardship. -Collaborative, integrated approaches to mgt and use of marine and freshwater resources. Better knowledge of the nature of marine/freshwater resources/ecosystems and their uses. -Better understanding, more scientific and other knowledge to support decision making. Effective application of knowledge, technologies to support sustainable/safe resource use. -Application of navigation/communication technologies. -Application of science, socioeconomic analyses and technologies for sustainable use. Reduction of negative environmental impacts of development operations. -Operations consistent with international/national environmental management standards Management system to track performance of the Sustainable Development Plan. -Commitments for sustainable development integrated into other resource plans.
Desired Outcomes	Improved stakeholder involvement in stewardship. Improved scientific research. More accurate, timely in-season information to fisheries managers. A cohesive, cross-sectional data management system. Better understanding and impacts of aquaculture and how to minimize/mitigate negative effects. More effective management strategies based on the precautionary approach. Guidelines in place to support sustainable aquaculture. Strengthened conservation and protection of ecosystems. Environmental performance baselines established. Environmental management programs developed and their effective implementation. Review and measurement of progress towards meeting goals, objectives.
Issues	Northern fisheries face pressure from climate changes, pollution, mining, oil development. Unintended introduction of exotic species. Need to better understand and map submerged lands and ecosystems. Increasing the role of local groups in fisheries research and management.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Research results from the JTC plan could contribute to meeting selected goals and desired outcomes in this international plan.

Fisheries and Oceans Report on Plans and Priorities (2000-2001)

Aim of Plan

The DFO strategic plan will guide the department over the next 3-5 years to restore confidence and credibility, mandate renewal, and continue management improvement. In pursuit of goals, the department is committed to improving relations, achieving effective participation and sharing information with clients; promoting teamwork and excellence in service delivery; and, achieving results that benefit clients and society at large.

Components of Plan

Vision	Safe, healthy, productive waters and aquatic ecosystems, for the benefit of users by maintaining the highest possible standards of marine safety and environmental protection, scientific excellence and conservation and sustainable resource use.
Goals	Manage and protect fisheries resources. Protect marine and freshwater environments. Understand oceans and aquatic resources. Maintain maritime safety. Facilitate maritime commerce and ocean development.
Categories	Status of fish stocks and fish management plans. State of ecosystems and habitat management practices. Scientific research and understanding. Environmental protection and response. Socio-economic benefits. Public awareness and client satisfaction.
Objectives	Provide high quality scientific advice. Improved protection of fish stocks by applying the precautionary approach. Review and develop policy. Integrate into other plans. Negotiate co-management agreements to shift stewardship responsibilities. Improve efficiency of Habitat Program through early intervention. Increase habitat quality through habitat restoration. Support community-based projects. Understand ecosystem dynamics: causes and impacts. Promote partnering and leveraging opportunities to enhance research alliances. Encourage local involvement, voluntary compliance, shared accountability.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The JTC plan could provide research results that contribute to objectives in this Canadian plan. The JTC plan could design research to promote the understanding of freshwater ecosystem dynamics, and to promote partnering opportunities to enhance research alliances.

Monitoring and Reporting Policy (dated January 2002)

Aim of Policy

Timely and accurate information on harvest and means is essential to assess the status of fish stocks and to ensure the conservation and long-term sustainability of fish resources. Effective fishery monitoring is integral to resource management and the enforcement of regulations. This policy aims to assist in: identifying gaps and other deficiencies (such as duplication) in present monitoring and reporting programs; to establish appropriate monitoring and reporting standards; and, requirements to meet those standards. Specific activities supported by fishery monitoring and reporting include stock assessment, management, and socioeconomic analysis. Monitoring and reporting supports objectives for the Precautionary Approach Policy and the Selective Fishing Policy.

Components of Policy

Mission	To provide a framework and set of principles to guide the review, and where necessary the reform, of fishery monitoring and catch reporting programs.
Principles	<p>All fisheries must have monitoring and reporting programs of sufficient accuracy and precision.</p> <p>Monitoring and reporting must be adequate to meet provisions of international treaties.</p> <p>Monitoring and reporting must address known ecosystem concerns including information on discards, by-catch and habitat impacts.</p> <p>Standards will be established to assess the biological impact of the fishery on the stock:</p> <ul style="list-style-type: none"> -Types of data (e.g., effort, value, etc) and level of detail (e.g., daily, weekly activity). -Precision/accuracy of estimates if subsampling. -Timeliness of data. -Uniform coding schemes. -Data and software formats. <p>Data will be collected in the most cost-effective manner to meet required standards.</p> <p>Harvesters are responsible for providing catch monitoring data to the department.</p> <p>All catch data is owned by the department and is confidential.</p>
Issues	<p>How can catch reporting for 1st Nation's salmon fisheries become more timely and accurate?</p> <p>How can catch reporting for sport salmon fisheries become more timely and accurate?</p> <p>How can catch reporting for commercial salmon fisheries become more timely and accurate?</p> <p>Should the economic value (including nonmarket) of aboriginal harvests be estimated?</p> <p>How can information on the economic value of sport fisheries be best captured?</p> <p>How can information on the economic value of commercial fisheries be best captured?</p>

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Design and implement research to address data gaps in timely assessment of harvests.

Precautionary Approach Policy (dated September 2001)

Aim of Policy

Governments must address new or emerging risks and manage issues where a lack of scientific certainty exists. This discussion paper outlines broad principles to support consistent, credible and predictable policy and regulatory decision making when applying the precautionary approach. The precautionary approach is a distinctive approach within risk management that primarily affects the development of options; it is guided by judgment, and based on values and priorities. The precautionary approach will be applied to protect the environment. Lack of scientific certainty will not be used as a reason for postponing cost-effective measures to prevent environmental degradation. This policy supports the 1992 Rio Declaration on Environment and Development.

Components of Policy

Mission	To provide a clear and consistent framework for applying the precautionary approach.
Goals	Increase coherence and consistency of the risk-managing process. Provide an appropriate balance of flexibility and predictability. Be adaptable to various functional areas. Be value-laden as a complement to tools for risk management.
Purposes	Improve predictability, credibility, consistency to ensure policy is adequate, reasonable. Support decision making while minimizing crises, controversies. Increase confidence of the public that decision making is rigorous, sound and credible. Increase Canada's ability to influence international standards.
Principles	The precautionary approach is a legitimate and distinctive tool in risk management. It's legitimate for decisions to be guided by society's chosen level of protection against risk. Sound scientific information must be the basis for applying the precautionary approach. Scientific evidence required should be established relative to the level of protection. Mechanisms should exist to re-evaluate the basis for decisions. Greater degree of transparency, clear accountability, increased public involvement. Precautionary measures should be subject to re-consideration. Precautionary measures should be proportional to severity of risk being addressed. Precautionary measures should be nondiscriminatory. Precautionary measures should be cost-effective. Where more than one option meets the characteristics, apply the least trade-restrictive.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The JTC plan could incorporate the concept of using caution in the face of uncertainty.

Selective Fishing Policy (dated January 2001)

Aim of Policy

This policy aims to develop a strategy to harvest available abundances of large, healthy stocks while ensuring conservation of smaller, threatened stocks. Selective fishing is a requisite element of conservation-based fisheries. In meeting conservation objectives, fishing opportunities and resource allocations will be shaped by the ability of all harvesters to fish selectively. To encourage selective fishing, a portion of the available commercial catch will be set aside for fishers to test alternative fishing gear and technology; and, commercial allocations will favor those who can demonstrate their ability to fish selectively. This policy is part of the “New Direction for Canada’s Pacific Salmon Fisheries” initiative. This policy meets objectives of the federal Oceans Act, requirements of the Species at Risk Act, and the United Nations FAO International Plan of Action for the reduction in bycatch. Selective fishing standards will be established for all fisheries by January 2003.

Components of Policy

Mission	To ensure that selective fishing technology and practices are adopted where appropriate in all fisheries of the Pacific region, and there are continuing improvements in harvesting gear and related practices.
Principles	Conservation of fish stocks is the primary objective and takes precedence. All sport and commercial fisheries will adhere to selective fishing standards. Where standards are not met and bycatches prevent conservation, fishing will be curtailed. Four fundamental strategies for selective fishing to minimize mortalities will be adopted: -Avoid non-target species through time and area restrictions -Avoid through gear designs -Release fish unharmed before being brought on board or ashore -Or, release fish unharmed from vessel or landing site. First Nations, sport, commercial sectors are responsible for learning selective fishing skills.

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Conduct research into the best methods to avoid non-target species or release catches unharmed.

Wild Salmon Policy (dated March 2000)

Aim of Policy

This policy is part of the “New Direction for Canada’s Pacific Salmon Fisheries” initiative and provides an explicit conservation framework to conserve the genetic diversity of wild salmon and to protect their habitat from irreversible depletion. This policy is consistent with the UN Convention on Biological Diversity, and addresses responsibilities stated in the Canadian Fisheries Act.

Components of Policy

Goal	To ensure the long-term viability of Pacific salmon populations in natural surroundings and the maintenance of fish habitat for all life stages for the sustainable benefit of the people of Canada.
Principles	<p>Conserve wild salmon by maintaining diversity of local populations and their habitat.</p> <p>Manage wild salmon as aggregates of local populations called conservation units.</p> <p>Determine minimum and target levels of abundance for each conservation unit.</p> <p>Manage to conserve wild salmon and optimize sustainable benefits.</p> <p>Cultivation methods may be used to preserve populations at greatest risk of extirpation.</p> <p>Conservation of wild salmon takes precedence over production involving cultivated salmon.</p>
Factors; issues	<p>Environmental uncertainty; natural variability.</p> <p>Loss and degradation of freshwater habitat.</p> <p>Values of MSY from historical fisheries data may not apply to current situation.</p> <p>There is no correct answer to precisely how much biological diversity should be maintained.</p> <p>Harvest rate must be reduced to conserve the least productive population.</p> <p>Linkages to the ecosystem from nutrients in salmon carcasses not fully understood.</p> <p>There are possible genetic diversity risks from salmon cultivation.</p>

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

The limit reference point (LRP) and target reference points (TRP) specified for each conservation unit are based on estimates of productive capacity. Abundance between the LRP and TRP implies that the conservation unit requires rebuilding. Abundance below the LRP implies a stock collapse and the conservation unit is at risk. The policy gives examples of how to estimate productive capacity. Following definition and identification of conservation units, the JTC could explore and discuss these concepts, seeking corollaries in Alaska. Many issues apply to the entire Yukon River drainage, such as: to what extent the LRP and TRP have been established per conservation unit in the Yukon Territory; and how estimates of productive capacity can be improved.

Management of Fish Habitat Policy (dated October 1986)

Aim of Policy

The wise management of fish habitat supporting productive fisheries will ensure continued socioeconomic benefits generated by the fisheries. Through this policy the DFO hopes to achieve an overall net gain in the productive capacity of fish habitats by active conservation of current habitat and the restoration of damaged habitats. Fish habitat needs will be integrated with fish management objectives. This policy fulfills Canada's commitment to the UN World Conservation Strategy, and the World Commission on Environment and Development.

Components of Policy

Mission	Increase the natural productive capacity of habitats for the nation's fisheries resources to benefit present and future generations of Canadians.
Principle	<p>No net loss of the productive capacity of habitats.</p> <ul style="list-style-type: none"> -Will strive to balance unavoidable losses with replacement of habitat. - The Principle serves as a guide and not a statutory requirement. - The Principle can be applied on a stock- or geographic-area basis. - The Principle offers flexibility in the search for solutions.
Goals	<p>Maintain productive capacity of habitat so that fish are produced for human consumption.</p> <ul style="list-style-type: none"> -The level of protection takes into account the contribution to sustaining fisheries. -Will strive to prevent losses of natural production areas. -Negative impacts of projects will be controlled through enforcement. - DFO will cooperate with agencies to implement procedures on an ecosystem basis. - Will cooperate to identify unique and productive habitat. - Will consider establishing sanctuaries consistent with fish management objectives. <p>Rehabilitate fish habitat in selective areas where socioeconomic benefits can be achieved.</p> <ul style="list-style-type: none"> -Productive capacity may be increased by restoration. -This goal requires scientific research to test new methods for restoring habitat. <p>Improve and create habitat in selected areas where fish production can be increased.</p> <ul style="list-style-type: none"> -Productivity may be increased by manipulating chemical, physical, biological factors. -This goal requires scientific research to test new methods for increasing productivity.
Implementation Strategy	<p>Enforce compliance with habitat protection requirements.</p> <p>Integrate habitat priorities into other resource plans.</p> <p>Conduct research to provide information and technology for conservation, restoration.</p> <p>Consult the public.</p> <p>Promote public awareness.</p> <p>Encourage and support cooperative involvement with agencies, interest groups.</p> <p>Provide advice for other agencies and public interest groups.</p> <p>Evaluate the effectiveness of decisions and measures taken to conserve, restore and develop.</p>

How the JTC Yukon Plan Could Fill Gaps and Forge Linkages

Conducting scientific research to provide the information and technology necessary for the conservation, restoration and development of fish habitats meets goals of this policy. Discussing and establishing the priority rating for salmon habitat objectives and issues in the Yukon River research plan meets an objective of the policy.

Protocols for Social Science Research

In Alaska, the ADF&G and U.S. Fish and Wildlife Service research programs involving the collection of information from indigenous cultures observe guidelines in the document, “Ethical Principles for the Conduct of Research in the North”, produced by the Association of Canadian Universities for Northern Studies in 1981. The National Science Foundation’s Interagency Arctic Research Policy Committee built upon this policy and in 1990 developed “Principles for the Conduct of Research in the Arctic” which the agencies also observe. Some tribes developed their own protocols for conducting work in specific regions, such as the Teslin Tlingit. Recognizing additional aspects involved in collection of traditional knowledge, the U.S. Fish and Wildlife Service is in the process of developing specific protocols for disposition of materials, analysis of information, and intellectual property rights.

This synopsis serves as a starting point for the collection of protocols, and three documents currently available are printed in their entirety in Appendix B.

GLOSSARY

Category	A division of a system of classification.
Factor	A cause that contributes to producing a result.
Goal	Long term achievement that contributes to accomplishing of mission. Goal is a metaphor for “aim”.
Guideline	A suggestion or rule that gives directions or sets standards.
Issue	Problem, impediment to overcome, uncertainty, lack, data gap.
Mission	A responsibility to fulfill. A mission has more import than a vision.
Objective	Measurable statement of purpose; a secondary or intermediary step.
Option	Possible solution or course of action (e.g., research project) to take to address an issue.
Outcome	Potential state or condition derived from a plan or policy.
Plan	Specified framework for achieving goals.
Policy	Authorized means of achieving goals. When a plan has been officially adopted it becomes a policy.
Principle	A general truth or fundamental concept; an established mode of operation. A principle has more import than a guideline.
Purpose	Something particular to be obtained; a fixed determination. Purpose is a metaphor for “goal”, however connotes a stronger usage, such as applying a strong will or desire.
Strategic planning	Repetitive decision-making activity involving thinking and social processes that help to design what is perceived as a desirable outcome.
Vision	Foresight; something imagined or anticipated.

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APPENDIX A

Appendix A.1. Missions of strategic research plans for Alaska salmon and their habitats by region.

Copper River (revised)	Kuskokwim	Southeast	Cook Inlet
<p>Manage, protect, maintain and improve chinook, sockeye and coho salmon stocks and their habitats for the maximum benefit to the economy of the state, consistent with the sustained yield principle and subject to allocations through public regulatory processes.</p>	<p>Develop a strategic research plan for chinook, chum, coho and sockeye salmon in the Kuskokwim River drainage so that stock assessment funds made available through various sources [...] are directed towards meeting the information needs and thus the goals of the Sustainable Salmon Policy.</p>	<p>Develop a strategic research plan for salmon research, monitoring, restoration and stewardship in southeast Alaska so that funds made available through various sources [...] are directed towards meeting the information needs and thus the goals of the Sustainable Salmon Policy.</p>	<p>Manage, protect maintain and improve salmon stocks and their habitats in upper Cook Inlet for the maximum benefit to the economy of the state, consistent with sustained yield principle and subject to allocations through public regulatory processes.</p>

Appendix A.2. Goals of strategic research plans for Alaska salmon and their habitats by region.

Subject	Copper River (revised)	Kuskokwim	Southeast	Cook Inlet
Wild stock escapement	1. Maintain wild salmon stock escapements within ranges to sustain salmon production, diversity, human uses and a functioning ecosystem.	1. Maintain wild salmon stock escapements within ranges to sustain salmon production, diversity and normal ecosystem functioning.	1. Maintain and restore wild salmon stocks at levels of high potential productivity.	1. Maintain wild salmon escapements within ranges to sustain salmon production, diversity, and a functioning ecosystem to provide for human use.
Harvest management	2. Harvest in a manner consistent with regulatory and departmental management plans.	2. Harvest with caution commensurate with uncertainty.	2. Maintain effective salmon management systems to regulate human activities that affect salmon.	2. Develop and improve information to regulate harvest consistent with achieving biological and management objectives.
Habitat	3. Protect and restore coastal and watershed habitat for salmon migration, spawning, and rearing.	3. Protect marine, coastal and watershed habitat for wild salmon migration, spawning and rearing.	3. Protect and restore freshwater, estuarine and marine salmon habitats to maintain resource productivity.	3. Protect and restore coastal and watershed habitat for salmon migration, spawning, and rearing.
Public	4. Promote public support and involvement for sustained use and protection of salmon resources.	4. Promote public involvement for sustained use and protection of salmon resources.	4. Promote public involvement and support for sustained use and protection of salmon.	4. Educate and involve the public to promote sustained use and protection of salmon resources.
Enhanced production	5. Manage enhanced production in a manner to provide for human needs while not compromising wild stock integrity and sustainability.	(included in goal #2 at objective level)	(included in goal #2 at objective level)	5. Manage enhanced production to provide for human needs while not compromising wild stock integrity.
Net benefits	(included in goal #2 at objective level)	5. Consider net social and economic benefits from the fisheries to users.	(included in goal #2 at objective level)	--

APPENDIX B

INTRODUCTION

In too many cases, researchers have worked in isolated communities without regard for the people who live there. Communities have been disrupted, and essential local resources used without consultation. Privacy is difficult in small communities, creating additional problems for participants. Guidelines, or principles, are needed so that research may be carried on with a minimum of friction and social disruption. The principles proposed here are intended to promote co-operation and mutual respect between researchers and the people of the North.

Northerners are involved with research in several different ways:

1. As research subjects.
2. Providing information.
3. As part of a research team.
4. Using the completed research.
5. Identifying research needs.

If research is to be explained clearly, conducted ethically, and used constructively, it must be guided by principles that consider all of the above mentioned ways in which Northerners are likely to be involved in research activities.

PRINCIPLES

1. The research must respect the privacy and dignity of the people.
2. The research should take into account the knowledge and experience of the people.
3. The research should respect the language, traditions, and standards of the community.
4. The person in charge of the research is accountable for all decisions on the project, including the decisions of subordinates.
5. No research should begin before being fully explained to those who might be affected.
6. No research should begin without the consent of those who might be affected.
7. In seeking informed consent, researchers should clearly identify sponsors, purposes of the research, sources of financial support, and investigators responsible for the research.
8. In seeking informed consent, researchers should explain the potential effects of the research on the community and the environment, and should explain the use and value of the research to the community.

-Continued-

9. Informed consent should be obtained from each participant in the research, as well as from the community at large.
 10. On an on-going basis, participants should be fully informed of any data gathering techniques developed and used during the course of the research (such as tape recordings, photographs, physiological measurements, etc.), and the use to which they will be put.
 11. No undue pressure should be applied to get consent for participation in a research project.
 12. Research subjects should remain anonymous unless they have agreed to be identified; if anonymity cannot be guaranteed, the subject must be informed of the possible consequences of this before becoming involved in the research.
 13. If, during the research, the community decides that the research is unacceptable to the community, the researcher and the sponsor should suspend the study.
 14. On-going explanations of research activities, methods, findings, and their interpretation should be made available to the community, with the opportunity for the people to comment before publication. Summaries also should be made available in the local language.
 15. Subject to requirements for anonymity, descriptions of the data should be left on file in the communities from which they were gathered along with descriptions of the methods used and the place of data storage.
 16. All research reports should be sent to the communities involved.
 17. All research publications should refer to informed consent and community participation, and acknowledge community contributions to the research project.
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Appendix B.2. Principles for the Conduct of Research in the Arctic (NSF/IARP Guidelines).

All scientific investigations in the Arctic should be assessed in terms of potential human impact and interest. Social science research, particularly studies of human subjects, requires special consideration, as do studies of resources of economic, cultural, and social value to Native people. In all instances, it is the responsibility of the principal investigator on each project to implement the following recommendations:

1. The researcher should inform appropriate community authorities of planned research on lands, waters, or territories used or occupied by them. Research directly involving northern people or communities should not proceed without their clear and informed consent. When informing the community and or obtaining informed consent, the researcher should identify:
 - a. all sponsors and sources of financial support;
 - b. the person in charge and all investigators involved in the research as well as any anticipated need for consultants, guides, or interpreters;
 - c. the purposes, goals, and time frame of the research;
 - d. data-gathering techniques (tape and video recordings, photographs, physiological measurements, and so on) and the uses to which they will be put; and
 - e. foreseeable positive and negative implications and impacts of the research.
2. The duty of researchers to inform communities continues after approval has been obtained. Ongoing projects should be explained in terms understandable to the local community.
3. Research should consult with and, where applicable, include northern communities in project planning and implementation. Reasonable opportunities should be provided for the communities to express their interests and to participate in the research.
4. Research results should be explained in non-technical terms and, where feasible, should be communicated by means of study materials that can be used by local teachers or displays that can be shown in local community centers or museums.
5. Copies of research reports, data descriptions, and other relevant materials should be provided to the local community. Special efforts must be made to communicate results that are responsive to local concerns.
6. Subject to the requirements for anonymity, publications should always refer to the informed consent of participants and give credit to those contributing to the research project.
7. The researcher must respect local cultural traditions, languages, and values. The researcher should, where practicable, incorporate the following elements in the research design:
 - a. Use of local and traditional knowledge and experience
 - b. Use of the languages of the local people.
 - c. Translation of research results, particularly those of local concern, into the languages of the people affected by the research.

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8. When possible, research projects should anticipate and provide meaningful experience and training for young people.
9. In cases where individuals or groups provide information of a confidential nature, their anonymity must be guaranteed in both the original use of data and in its deposition for future use.
10. Research on humans should only be undertaken in a manner that respects their privacy and dignity:
 - a. Research subjects must remain anonymous unless they have agreed to be identified. In anonymity cannot be guaranteed, the subject must be informed of the possible consequences of becoming involved in the research.
 - b. In cases where individuals or groups provide information of a confidential or personal nature, this confidentiality must be guaranteed in both the original use of data in its deposition for future use.
 - c. The rights of children must be respected. All research involving children must be fully justified in terms of goals and objectives and never undertaken without the consent of the children and their parents or legal guardians.
 - d. Participation of subjects, including the use of photography in research, should always be based on informed consent.
 - e. The use and disposition of human tissue samples should always be based on the informed consent of the subjects or next of kin.
11. The researcher is accountable for all project decisions that affect the community, including decisions made by subordinates.
12. All relevant Federal, State, and local regulations and policies pertaining to cultural, environmental and health protections must be strictly observed.
13. Sacred sites, cultural materials, and cultural property cannot be disturbed or removed without community and/or individual consent and in accordance with Federal and State laws and regulations.

Appendix B.3. Protocol on the conduct of research and on the use of traditional knowledge of the Teslin Tlingit (Teslin document scanned).

PROTOCOL ON THE USE OF TRADITIONAL KNOWLEDGE OF THE TESLIN TLINGIT

REVISED JUNE 27, 2000

PROTOCOL ON THE CONDUCT OF RESEARCH AND ON THE USE OF TRADITIONAL KNOWLEDGE
OF THE TESLIN TLINGIT

This research protocol was adopted by Executive Council of the Teslin Tlingit Council and shall apply to any research proposed to be undertaken in the Teslin Tlingit Traditional Territory and/or affecting Citizens of the Teslin Tlingit Council

DEFINITIONS

1. The following definitions apply in this protocol.

'Citizen' means a Citizen of the Teslin Tlingit Council,

'confidential information' means traditional knowledge, whether presented orally or in writing, which is usually treated as information confidential to the Teslin Tlingit or to a clan of the Teslin Tlingit and may include, without limitation, information regarding sites of cultural or heritage significance and value to the Teslin Tlingit,

'Council' means the Teslin Tlingit Council,

'Researcher' means a person or agency who proposes to undertake research involving or affecting Citizens or the Council, and

'traditional knowledge' means the existing Tlingit knowledge system of land, water, climate, seasons and related animal behaviours in the Teslin Tlingit Traditional Territory, based on ancestral experiences, oral history, subsistence harvesting and traditional use of plants and animals, as well as the use of historical waterways, trails and other nomadic travel paths.

PURPOSE

2. The protocol is intended to clarify the roles and responsibilities of the Council and Researchers in conducting research and, in particular, acquiring, using and reporting on traditional knowledge obtained from the Council and Citizens.

3. All research must

- (a) show respect to the land and to Citizens and to the traditional knowledge held by Citizens;
- (b) ensure protection of the cultural and personal importance of traditional knowledge to Citizens and the Teslin Tlingit;
- (c) promote connections and linkages between traditional knowledge and other forms of knowledge and understanding between the Researcher, the Council, Citizens and other members of society.

RESEARCH DESIGN

4. A Researcher must submit an outline of the research design for his or her work to the Council no later than three months before the work is to be initiated. The outline must describe the following.

- (a) The nature, scope and intent of the research to be undertaken.

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PROTOCOL ON THE USE OF TRADITIONAL KNOWLEDGE OF THE TESLIN TLINGIT

- (b) Whether the research will involve the use or collection of traditional knowledge and if so, how the Researcher proposes to obtain traditional knowledge. If the Researcher intends to interview Citizens, by any means or method, the Researcher must indicate
 - (i) how s/he will identify the people to be interviewed,
 - (ii) the questions to be posed to Citizens,
 - (iii) the methods to be used by the Researcher to ensure that all Citizens to be interviewed are fully informed of the nature, scope and intent of the research, of how the Citizen's information will be used by the Researcher and how the Researcher will initially obtain, and subsequently reconfirm, that the Citizen gives their informed consent to participate in the research, and
 - (iv) what arrangements will be put in place to ensure that an interpreter is available to the Researcher, where necessary.
 - (c) The methodology of the study overall, including a description of how traditional knowledge will be used in the research and analyzed or otherwise included in coming to the conclusions of the research.
 - (d) How traditional knowledge collected will be protected from subsequent release and, if appropriate, how the anonymity of those providing information will be assured in documenting and reporting on the research.
 - (e) Remuneration, in the form of honoraria or salary, that may be available to Citizens who participate or assist in conducting the research.
 - (f) How the information gathered and generated by the research will be of use, and be reported, to Citizens participating in the research, as well as other Citizens.
5. The Council agrees to review the outline submitted by the Researcher and to provide comments on the research design within sixty days of receipt of the outline. If the Council does not support the research design or has concerns with specific aspects of the design, the Council shall inform the Researcher of these concerns as soon as possible within the sixty day period.
 5. The Researcher must give full and fair consideration to the comments and concerns of the Council and, if necessary, modify the research design to address these comments and concerns. As appropriate, the Researcher will travel to the offices of the Council and meet with representatives of the Council to ensure that the research design is acceptable to the Council.
 7. Researchers are advised that the Council will support only research projects that employ at least one Citizen who is to work with the Researcher in conducting the research.
 8. No research shall be undertaken until and unless the research design is acceptable to the Council.
 9. The Council shall ensure that research for which the Council is to make recommendations to the Teslin Renewable Resources Council (i.e. wildlife surveys and research permits for government surveys and research within Settlement Land) and research for which a permit must be obtained under the *Fish and Wildlife Act*, S.T.T.C. 1998, c.1 is reviewed in accordance with this protocol before any recommendations are made or permits issued. For greater certainty, the research design for a project for which a permit is required under the *Fish and Wildlife Act* must be submitted by a Researcher and reviewed in accordance with this protocol before a formal application is made for the permit to General Council by the Researcher.

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PROTOCOL ON THE USE OF TRADITIONAL KNOWLEDGE OF THE TESLIN TLINGIT

USE OF CONFIDENTIAL INFORMATION

10. Research designed to collect and use confidential information shall only be undertaken in exceptional circumstances and with the approval of the Executive Council. Prior to giving its approval, the Executive Council shall seek, and fully consider, the advice and wisdom of the Elcer's Council.
11. A Researcher must sign an undertaking with the Council confirming that any confidential information collected or used by the Researcher will be used only for the purposes of the research. The Researcher must further undertake to ensure that any confidential information to be included in any report or document pertaining to the research will be conveyed in such a fashion as to protect the identity of any Citizens about whom the information pertains and/or to protect the geographic location of any site about which the information pertains.

OWNERSHIP AND USE OF TRADITIONAL KNOWLEDGE

12. Notwithstanding that a Researcher may collect and use traditional knowledge in undertaking research, ownership of the traditional knowledge remains with the Citizen and/or Council, whichever provided the information.
13. A Researcher must provide to the Council all original notes, video or audio tapes or other form of recording used by the Researcher to collect and document traditional knowledge. Only in exceptional circumstances, and with the approval of the Council and if the information is obtained from a Citizen, with that Citizen's approval, may a Researcher keep a copy of the notes, video or audio tapes or other form of recording of traditional knowledge. In giving its approval, the Council and the Citizen may attach any terms and conditions it determines to be appropriate in the circumstances.
14. A Researcher must confirm, in writing and before undertaking any research, that any copyright matters that may arise in relation to the collection and use of traditional knowledge will be resolved in favour of the Citizen or Council, whichever provided the information. The Researcher agrees that no copyrights will transfer from the person from whom the information is received to the Researcher or any agency or organization associated with the Researcher.
15. Unless the Council and every Citizen from whom the Researcher collects traditional knowledge consents, in writing, a Researcher may only use traditional knowledge obtained from the Council and/or Citizens for the purpose for which it was originally collected by, or provided to, him or her.

DISPUTE RESOLUTION

16. The Council and the Researcher shall meet regularly to review the progress of the research and to address any problems that may arise before such concerns become significant. If the Council believes it is appropriate in the circumstances, it will establish a Community Advisory Committee to work with the Researcher on behalf of the Council and Citizens who are involved in the research.
17. If any disputes arise that cannot be resolved by the Community Advisory Committee and the Researcher, the Council may establish a three-person Dispute Resolution Committee. The

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Dispute Resolution Committee will be composed of one person appointed by the Council, one person appointed by the Researcher and one person appointed with the support of both the Council and the Researcher, who shall act as chair of the Committee. The Committee will review all issues in dispute and make recommendations to the Council and the Researcher as to their resolution. The Council and Researcher will give full and fair consideration to the recommendations of the Dispute Resolution Committee, however the recommendations are not binding upon either the Council or the Researcher. If at the end of this process the matters are not resolved, the Council shall take steps to bring Tlingit involvement in the research project to an end and advise Citizens of their position on the research.

COMMUNICATIONS

19. The Researcher shall provide the Council with a communication plan that describes how and with what frequency the Researcher will make progress reports on the research to the Council and Citizens before starting his/her research.
20. The Researcher shall work with the Council to determine how the results of the research can best be presented to Citizens and how Citizens may comment upon and have input into the analysis involved in the research and on the conclusions to be drawn by the Researcher before any final conclusions are drawn by the Researcher. Discussions on this point may be ongoing throughout the research, but the Researcher and Council must ensure that Citizens have an opportunity to learn of the draft results and conclusions of the research before the results are finalized and communicated to any other body, person or institution.
21. The Researcher and the Council shall determine if communications with the media are appropriate in the circumstances of the research and shall determine who shall be the media spokesperson.

RELEASE OF REPORTS AND RELATED INFORMATION

22. A Researcher must obtain the written consent of the Council to release a report or any other document or material obtained by the Researcher as a result of conducting the research before the report, document or other material is released by the Researcher. The Council may refuse to give its consent to the release or it may permit the unlimited or limited release of a report, document or other material and obtain the assurances of the Researcher that the report, document or other material will only be released as permitted by the Council.
23. In determining whether the report, document or other material should be released, the Council shall give due consideration to the purpose of the research and shall not unreasonably withhold its consent to the release.
24. If the Council determines that it will not consent to the release of the report, document or other material, it shall provide written reasons to the Researcher. Where consent is refused, a Researcher may request, in writing, that the Council reconsider its decision and the Council shall reconsider its decision and provide written reasons for its final decision on the matter.
25. If the Council determines that a report or any other document or material obtained by a Researcher should be released only on a limited basis and either the Researcher or the Council receives a request for a copy of the report, document or other material

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- (a) the Researcher may only release the report, document or other material with the written consent of the Council; and
- (b) the Council may only release the report, document or other material if the release is permitted by the attached Access to Information Policy.

DELEGATION

- 26. The Council may delegate any or all of its responsibilities under this protocol to a Community Advisory Committee established for the research or to any other person. A delegate is responsible for making regular progress reports to the Council on the research.

This protocol was adopted by Executive Council on _____ day of _____, 2000.

Eric Morris, Chief
Teslin Tlingit Council

Recording Secretary