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**AYK SSI 2021 INVITATION TO SUBMIT RESEARCH PROPOSALS**

**RESEARCH PRIORITIES & SUBMISSION INSTRUCTIONS**

**INTRODUCTION:**

The [Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/) (AYK SSI) is pleased to release its 2021 Invitation to Submit Research Proposals. Under the [2021 Invitation](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/), **up to $1.4M** is available for funding of research projects addressing the region’s declined Chinook salmon populations.

**2021 Invitation Overview:**

|  |  |  |
| --- | --- | --- |
| Invitation Release Date: |  | **October 20, 2020** |
| 2021 Funding Level: |  | Up to $1.4M |
| **Proposal Submission Deadline:** |  | **December 16, 2020** |
| Project Start Dates:  |  | May 1, 2021 or later |
| Duration of Projects: |  | **Projects must end on or before June 30, 2024** |
| Final Selection of Proposals for Funding: |  | Early April 2021 |

The [2021 Invitation](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/) has two components:

1. **AYK SSI 2021 Research Priorities &** **Proposal Submission Instructions:** (This MS Word file) Below you will find:
* A list of the five priority “Research Themes” focusing on Chinook salmon as the species of special concern;
* Proposal formatting requirements & template required for submission; and
* Information about our online proposal submission system.
1. [**AYK SSI Budget Forms**](http://www.aykssi.org/wp-content/uploads/AYKSSI-2021-RFP-Budget-Forms.xls)**:** (MS Excel file) provides instructions and required budget forms which must be uploaded to the online proposal submission system, along with your completed proposal narrative.

**AYK SSI 2021 RESEARCH PRIORITIES**

**SPECIES OF SPECIAL CONCERN: AYK Region Chinook Salmon Populations**

The AYK region has experienced disastrous and sustained declines of Chinook salmon over the past decade, resulting in years of region-wide commercial fishing closures, extensive restrictions of subsistence harvests, and some years of unmet escapement targets in the Yukon, Kuskokwim, and Unalakleet Rivers. In response, the 2021 Research Priorities continue our program’s focus on Chinook salmon as the “Species of Special Concern.”

The 2021 Research Priority Themes 1-3 are drawn from the **AYK SSI Chinook Salmon Research Action Plan**, a strategic science plan focused on the most likely causes of the decline of Chinook salmon populations (see <http://www.aykssi.org/aykssi-chinook-salmon-research-action-plan-2013/>). Theme 4 is drawn from the broader **AYK SSI Research and Restoration Plan**, a science-based roadmap that identifies knowledge gaps and establishes research priorities for AYK salmon (see <http://www.aykssi.org/ayk-plan/>). Example research questions for these priority research themes can be found in these two salmon science plans. Theme 5 addresses the need to assess risks to salmon biodiversity and support sustainable management of at-risk stocks by providing robust assessment of the status of vulnerable, less productive Chinook salmon populations.

**THEME 1 – Drivers of Freshwater Mortality:** Have changes in the suitability or productivity of freshwater habitat used for spawning, rearing, and migration contributed to declines in AYK Chinook salmon stocks?

**Description**: This theme examines the way in which productivity and population dynamics of Chinook salmon populations are linked to forcing factors that control growth and survival during the freshwater component of their life cycle. For most salmon populations the freshwater stages sustain over half of the total egg-to-adult mortality. Adult, embryonic, and juvenile stages are all vulnerable to changes in freshwater environmental conditions. For example, incubating embryos can be affected by several variables including winter temperatures, oxygen regimes, and flow-related gravel scouring. Juvenile salmon, prior to ocean entry, may be limited by food resources that affect growth rates and associated survival during smolting, and by mortality losses to freshwater predators. The central question underlying this research hypothesis is whether any specific variable(s) in the freshwater environment could have contributed to the observed trends in AYK Chinook salmon.

**THEME 2 – Drivers of Marine Mortality:** Have changing ocean conditions (physical and biological) in the Bering Sea increased mortality of Chinook salmon and contributed to the decline of AYK stocks?

**Description**: This theme examines the way in which productivity and population dynamics of Chinook salmon populations are linked to environmental conditions that control growth and survival during the marine (including estuarine) component of their life cycle. During their marine life phase, changes in the physical environment (e.g., temperature) could affect salmon directly via physiological processes, or indirectly through changes in the food web. For example, increased upwelling can lead to higher primary and secondary production, leading to increased food availability for juvenile salmon. Changes in the biological environment, such as food web structure (i.e., prey, competitors, predators), can also affect feeding rates and ultimately survival. Additional research is needed to improve our understanding of the role of environmental forcing on salmon population dynamics and, in turn, to develop the capacity to distinguish between freshwater and marine drivers of those dynamics.

**THEME 3 - Escapement Quality:** Has selective fishing or other environmental factors altered the size, sex ratio, and composition of life history types in ways that have contributed to recent declines of AYK Chinook salmon?

**Description:** This theme focuses on the role of genetic selection by fisheries or other environmental factors to change the genetic component that determines age, size, growth, and time to maturity (phenotypic characters). Phenotypic characters are determined both by genetics and the environment. For example, genetics control the potential for growth and the environment provides food that controls the expression of that potential. The genetic changes hypothesized could affect the recruitment of subsequent generations of salmon.

**THEME 4 – Management for sustainability under uncertainty:** What management approaches are likely to be most robust to uncertainties of our mechanistic understanding of AYK Chinook salmon?

**Description**: Scientific understanding of AYK ecosystems will always be incomplete and a mechanistic understanding of the causes of variation in Chinook salmon populations may be sufficiently limited that prescriptive management is not effective. This theme encourages retrospective and simulation studies that assess the performance of different management approaches for maintaining productive Chinook salmon under varying levels of uncertainty. This research could include development and application of modeling approaches that evaluate risk under different management strategies, address critical data uncertainties, and develop alternative schemes for applying adaptive management to AYK Chinook salmon. ­­­­­­­­­­­­­­

**THEME 5 – Assessing Risks to Vulnerable Chinook Salmon Stocks**

**Description**: Chinook salmon stocks in the AYK region are composed of numerous discrete spawning populations, many with varying phenotypes and life histories. This diversity of populations produces a stabilizing effect where unproductive populations are compensated by the most productive populations at any point in time, thereby stabilizing annual returns to the river. However, in these large complex watersheds, highly productive populations are harvested together with low productivity or low abundance stocks, which may be at risk of unsustainable exploitation when part of such mixed-population fisheries. Recovering and managing at-risk stocks requires an understanding of the genetic and demographic thresholds for population viability as well as the best approaches for rebuilding and managing at-risk stocks. Under this theme we will consider funding projects:

1. Assessing the population viability of smaller or currently less productive stocks in the region including the risks of overharvest and extinction;

2. Inform management approaches to reduce these threats through the implementation of rebuilding actions and risk averse harvest strategies.

**AYK SSI 2021 DEADLINE & SUBMISSION INSTRUCTIONS**

**Deadline for submission is December 16, 2020 5:00 PM (AK time).** In the interest of fairness, proposals submitted after the deadline will not be considered.

**All investigators should submit their proposal via the** [**AYK SSI Online Submission System**](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/)(available beginning November 16, 2020 until the proposal deadline on December 16).

**ONLINE SUBMISSION:**

[**Online submission will be available here**](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/) **from November 16, 2020** until the proposal deadline on **December 16, 2020 @ 5:00 PM (AK time).**

Prior to uploading their proposal materials, investigators create an account on the AYK SSI Online Submission System. These investigator accounts will remain active until the submission deadline or until the full proposal package is finalized and formally submitted.  Investigators will be required to use submission forms as well as to upload their proposal file. All proposals must be prepared using the format described below.  Investigators will have the ability to modify any information provided to the system at any time prior to clicking on the final Submit button or until the proposal deadline.

Once all required fields are full, a final submission and confirmation page will appear. Once you click SUBMIT, no further changes or additions can be made to the submission and you will receive an email confirmation.

**EMAIL SUBMISSION:**

If you do not receive an email within two hours at the address you provided in the AYK SSI Online Submission System, you must:

**Email your proposal** to: Karen Gillis, karen@bsfaak.org making sure you save a copy of the email confirmation you will receive.

**Note:** Regardless of your method of submission, **you must ensure you obtain a written confirmation** of the successful submission of your proposal prior to the deadline.

**QUESTIONS ABOUT PROPOSAL CONTENT OR SUBMISSION PROCESS:**

For questions regarding this invitation, please contact the **AYK SSI Research Coordinator** **Dr.** **Joseph Spaeder,** joespaeder@gmail.com, (907) 299-8635.

**GENERAL INSTRUCTIONS:**

* Submit your proposal through the [AYK SSI Online Submission System](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/).
* Proposal and Curriculum Vitae (CV) should be prepared and submitted in MS WORD using 11-point. Include a one-page CV for each project investigator. CVs exceeding one page will not be accepted.
* Total length of the main body of the proposal, (Section II- Objectives and Project Design, excluding proposal summary, introduction, coordination, capacity building, budget pages, references and CV’s), **should not exceed 12 pages**.
* Do not change font styles or sizes of the headings and subheadings of the form.
* Delete all investigator instructions (those comments/descriptions contained in brackets listed after each heading/subheading) from the form prior to submittal of the proposal.
* Rename and save your completed MS Word proposal narrative (using the template provided below) with a new file name which includes the last name of the PI (i.e. "2021 AYK SSI Proposal [PI Last Name here].doc”). When completed, you will be uploading this MS Word file along with your proposal budget and other required documents to the [AYK SSI Online Submission System](https://www.aykssi.org/ayk-ssi-2021-invitation-to-submit-research-proposals/).
* Projects may start no sooner than **May 1, 2021** and end dates no later than **June 30, 2024**, and a Final Report will be due within 60 days of project completion.

**Note to Federal Proposing Agencies:** Federal agencies intending to submit proposals must seek prior written certification through AYK SSI as eligible to receive federal funding, if awarded. Please contact ­­­­­­­­­­­­­­­­­­­­­­­­­­Karen Gillis, karen@bsfaak.org, 907-279-6519.

**AYK SSI PROPOSAL TEMPLATE ­­­ 2021**

**[NOTE:** Delete investigator instructions (those comments/descriptions contained in brackets after each heading/subheading below) from the form prior to submittal of the proposal. Replace these sections with your proposal content.]

**Project Title:** [Limit title to 50 characters or less.]

**Investigator(s):** [Names of individuals proposing the project. Include affiliation and all contact information--address, phone, fax, and email. If there are multiple proposers/principle investigators, indicate which individual will serve as the lead investigator or project manager. Please be aware that email will be the primary method of communication regarding the status of your proposal.]

**Project Period:** [Successful proposals submitted for the 2021 AYK SSI funding cycle will be funded up to three years. Applicants should not request a project start date before **May 1, 2021.** All projects must be completed on or before **June 30, 2024**. Final project reports are due 60 days after the project end date.]

**AYK SSI Funding:** [Total amount of AYK SSI funding requested.]

**Matching Funds:** [Encouraged but not required. List the source and amount of funds which are already secured from non-AYK SSI sources, if any, that will be applied to the proposed project, including in-kind contributions and/or donations.]

**Study Location:** [General geographic area in which field work will be conducted, including the watershed and tributary as appropriate (e.g., Kwethluk River watershed.) If other areas of the state that may be impacted by this study, please list these areas as well.]

**Abstract:** [Provide a brief (300 words or less) summary of the project in language understandable to audiences unfamiliar with your subject area. The abstract may be edited for clarity, brevity, and readability by AYK SSI staff. The abstract should be suitable for reports to Congress, the Alaska state legislature, and the public. The abstract should include a short synopsis of the following:

* + 1. The issue addressed and why the project is needed
		2. Project hypotheses and objectives (see instructions for drafting research project objectives below)
		3. Overview of research methods
		4. Anticipated impacts/ outcomes, and any measurable benefits.]

**[If the above information exceeds one page, please set a page break at the end of the additional page(s).]**

**AYK SSI PROPOSAL FORMAT ­­­ 2021**

**I. INTRODUCTION**

[Provide the background and overview of the proposed work. What problem is the project designed to address? Describe the background and history of the problem. Review the scientific literature covering the most important works related to the project. The purpose of this overview and literature review is to place the proposed research in the larger context of what work has been done, what is known, and what remains to be known.]

**II. PROJECT DESIGN**

**A. Objectives and Project Design:** [Note: Section IIA- Objectives and Project Design (excluding proposal summary, introduction, coordination, capacity building, budget pages, references and CV’s), constituting the main body of the proposal, **should not exceed 12 pages**.]

1. **Rational & Project Research Question:** [Briefly describe the rationale for the project, stating what the project will accomplish and why it is important in helping to restore the Chinook salmon fishery, helping to understand the current drivers of decline and/or helping prevent a similar Chinook salmon failure in the future. State the central research question that will be addressed through the project, along with any related project-specific hypotheses. A good research question should be narrow enough to address specific issues, but not so narrow that it can be addressed with a yes or no answer or the gathering of a few statistics. A well-thought-out and focused research question leads directly into your project hypotheses-- about the nature and direction of the relationship between two or more variables. (Example research questions are found in Chapter 5 of the [AYK SSI Chinook Salmon Research Action Plan (downloadable here](http://www.aykssi.org/aykssi-chinook-salmon-research-action-plan-2013/).) Once research questions and hypotheses are formulated, research objectives can be developed (see below).]

**[Note to PI’s of active or recently completed AYK SSI funded projects:** If you are seeking funding for a project which links to, extends or compliments your active or recently completed (within the last two years) project you must provide, within this section, a clear description of your progress and findings to date and explain how your proposed research will inform and advance your existing or recently completed AYK SSI project.]

1. **Project Objectives:** [Numerically list (in the sequence of their completion) your research objectives. Objectives flow directly from the core research question(s) stated above. Many proposals fail to be recommended for funding because of poorly formulated objectives. Objectives are **not** methodological steps or lists of tasks (e.g., collect data, conduct experiments, analyze data, write report.) Research objectives identify a pattern or process to be described and can be used to evaluate research progress. Objectives should be worded to reflect the research question(s) above to be answered, the hypotheses to be tested, or the processes to be described. Objectives are the fundamental and measurable goals of your proposed work; the project objectives are what AYK SSI uses to evaluate progress and completion of the project. When little information exists to formulate questions and hypotheses then research objectives focused on description are appropriate. See **“Guidelines for Drafting Research Project Objectives”** below.]
2. **Project Responsiveness to AYK SSI 2021 Research Priorities:** [Clearly identify which of the AYK SSI 2021 Priority Research Theme(s) will be addressed through the project and briefly describe how, through implementation of the project objectives, your understanding of one or more of the priority research themes will be advanced.]
3. **Methods:** [Provide a concise overview of proposed methods, including your approach to achieving your objectives? Then, for each objective listed above, include study design, data collection procedures and analytical methods. Clearly identify the specific set of procedures needed to accomplish each objective. As appropriate, describe the statistical or conceptual model that is the basis for your work; including the experimental design, assumptions required, sample size and other relevant information. We encourage limiting this section to approximately three pages. However, this section should contain enough detail to allow a reviewer to understand how the study will be conducted, including how data will be collected and analyzed. Note: to improve clarity, the Methods section may be divided into subsections that represent different objectives of the study.]
4. **Results / Deliverable Products:** [Describe the project results and the products to be provided at the conclusion of the study, as well as their estimated completion date. Depending upon the specific study, deliverables may also include such products as electronic databases, graphics, or meetings. The AYK SSI encourages funded investigators to publish the results of their work in peer-reviewed journals. Note that AYK SSI reporting requirements include: quarterly Financial Status Reports, Semiannual Progress Reports, and a Final Project Report that describes fulfillment of objectives and includes an abstract, introduction, methods, results and discussion. The Final Project Report is due within 60 days of the project end date. Specific details about format, distribution and peer review of final reports can be found on our website ([www.aykssi.org](http://www.aykssi.org)) and will be addressed during development of funding contracts for successful proposals.]
5. **Milestones / Project Timeline:**
	1. [Using the format below specify when each project objective will be completed. Reviewers will use this information along with annual project reports to assess whether PIs are meeting objectives and are eligible for continued funding.

**Example:**

Objective 1. Develop sediment-core chronologies in lake-productivity indicators. To be met by October 2021

Objective 2. Compare sediment data corresponding to the past few decades to salmon population statistics. To be met by February 2022.

Objective 3. Reconstruct time-series of lake productivity, input of marine-derived nutrients, and salmon escapement. To be met by May 2023.]

* 1. [Estimate the beginning and completion dates for critical segments of the study, including all deliverables, and provide this information in tabular form following the examples below.

**Sample Project Schedule (Example project period 5/15/21 through 6/30/22):**

|  |  |  |
| --- | --- | --- |
| **TASKS** [Example only; insert tasks & details appropriate to your project.]  | **2021** | **2022** |
| **Start-up phase** | May-June |  |
| **Data Collection** | June- Sept |  |
| **Data Entry & Analysis** | Sept - Dec |  |
| **Grant Report Due** |  | Jan |
| **Report Writing** |  | April-June |
| **Submission of Final Report** | Final Report due August 30, 2024  |

1. **Performance Ability and Administrative Expertise:** [Briefly summarize the investigator(s) and/or organization’s experience in performing work similar to that proposed here. Past reports or professional journal articles by the investigator(s) relevant to this proposal should be cited, and unpublished work should be briefly described as it relates to the investigator’s or organization’s ability to accomplish the objectives. Describe the field capabilities needed to carry out the study when particular equipment or technologies are essential components to conducting a study (e.g., cultural and community knowledge, sonar equipment, shop facility for weir fabrication, drift gillnet boats). Describe the organizational ability to carry out the administrative aspects of the project. Other evidence of performance ability may be attached as an appendix to the proposal. Investigator’s performance ability and administrative expertise will be evaluated on the following:

a. History of investigator’s performance on past AYK SSI projects (if applicable).

b. Individual qualifications of each investigator (including field capabilities as applicable) and their role in the project.

c. Technical and administrative expertise of the applicant organization to complete the work.

d. Summary of experience.

e. Relevant past reports and articles.]

1. **Coordination and Collaboration with Other Efforts:** [Describe the relationships and links between the proposed project and other relevant projects in progress in the AYK region. Indicate how the proposed project relates to, complements, or includes collaborative efforts with other proposed or existing projects in the same geographic or topical area. Describe any coordination that has taken or will take place and what form the coordination will take (shared field sites, research platforms, sample collection, data management, equipment purchases, etc.). If the proposed project requires collaboration with other agencies, organizations or scientists to accomplish the work, such arrangements should be fully explained. If the relationship with other proposals is unknown, or if your proposal conflicts with another project, note this and explain why.]

**B. Capacity Building:** [The purpose of this section is to ensure that local communities are aware of the proposed work, and where appropriate, opportunities for local or regional capacity building have been designed into the project. Projects must include appropriate partners and contribute, to the maximum degree possible, to the capacities of agencies, local communities, and residents of the region to participate in fishery research. Prior to submission principal investigators must have completed appropriate consultation about their project with local villages and communities in the area where the project is to be conducted (letters of support from local organizations are strongly encouraged and add to the strength of a proposal). As appropriate, investigators and their organizations should be able to demonstrate the ability to create and/or maintain effective relationships with local communities/organizations and a commitment to capacity building.

 Please provide, as applicable:

* List the local communities that may be involved at some level with the project and/or realize benefits from the project.
* Description of consultations that have been conducted as part of planning of the proposed work.
* Present a plan for how this study will develop partnerships and build the capacity of individuals, agencies, and organizations in the region to meaningfully participate in fishery research activities. Indicate whether this study would provide opportunities to develop professional capabilities and administrative skills of agencies and organizations in the region.

For additional detail on this topic, see “**Guidelines for Capacity Building in the AYK SSI Research Program” below.**]

**C. Matching Funds / Partner Contributions:** [Matching funds are encouraged, but not required. What other entities, if any, have committed funding or are likely to fund the project you are proposing? If you have submitted your proposal to other potential funding sources, please describe to which source(s) it has been submitted, when a funding decision will be made, and - in the event other funding is approved - whether or not AYK SSI funds will also be needed.]

**III. BUDGET**

[**NOTE**: You must prepare your budget using the **2021 AYK SSI Budget Forms,** (MS Excel file). Instructions are provided on each budget worksheet. **Keep all worksheets in the same Excel workbook**, rename the Excel workbook with a new file which includes the last name of the PI (e.g. "2021 AYK SSI Budget Forms [PI Last Name here].xls”). When completed, you will be uploading this Excel file along with your proposal narrative and other required documents to the AYK SSI Online Submission System.

1. **Project Costs:** [Describe and justify the budget for each organization or agency requesting funding in this proposal using the mandatory budget categories and forms included in the MS Excel document. **NOTE: 10% of the total project funds will be held back pending submission of the Final Project Report**.

You must include in the proposal detailed narrative below text for each category providing a clear and complete explanation and/or process for how the funds will be used and/or allocated. Narrative totals must equal exactly the figures in the Excel budget form.]

* + **100 - Personnel (including Fringe Benefits):** [Include the salary detail for all employees assigned to this project. Explain the duties for each individual identified by name and position. State the time commitments such as hours and percent of time for each position. List the total charges for each person. Include all fringe benefits in correlation to the employee’s hourly wage and the number of hours to be worked in association with the proposed project. Identify what types of fringe benefits are being covered. Describe the total charges for each person listed along with an explanation of how the charges were calculated.]
* **200 - Travel:** [These costs include lodging, airfare, per diem, ground transportation and other directly-related expenses incurred while traveling for the purpose of the proposed project. Include each traveler’s name, dates of travel, purpose of travel, destination, and itemized costs to include lodging, airfare, per diem, ground transportation, etc. Identify why the requested travel is directly relevant to the successful completion of the project. If there are any actual trip details that remain unknown, please explain what the basis for the proposed travel charges. **NOTE:** During the final year of the project, applicants must include in their travel budget the costs for at least one representative of the project to attend an annual AYK SSI research review/outreach meeting to present their results. The principal investigator(s) shall cooperate with AYK SSI staff in developing materials for interpretation of the project and research results to the public.]
* **300 - Contractual:** [Include all expenditures associated with contractually-related activities that are directly associated with the proposed project. List each contract as a separate item. Describe the applicability to the project for each contract to be acquired.]
* **400 - Supplies:** [Include a description of all equipment that individually costs under $5,000 and miscellaneous supplies and materials that are required for the purpose of the proposed project. Itemize supplies by type of material or nature of expense. Identify how the proposed supplies are necessary for the successful completion of the project.]
* **500 - Equipment:** [Include items that individually cost more than $5,000. For any items of equipment whose costs exceed $5,000, a description of the item and associated costs is required. List each item of equipment being requested. For each item of equipment, please identify the number of units, cost per unit and total cost specified. Explain why each item of equipment is necessary for the successful completion of the project.]
* **600 - Indirect Costs:** [These are costs incurred by the investigating organization as a result of administering the proposed project but not directly associated with project implementation. Indirect costs generally include space rental, utilities, postage, data processing, training, safety management, affirmative action programs, administrative support, and supervisory oversight. **NOTE:**  All proposals must include copy of the approved negotiated indirect cost rate document or similar verifying your indirect rate as part of your proposal package. Our intent is that institutions undertaking research apply funds to expenses directly related to the project and have the ability to complete the project with low indirect cost rates.]
1. **Matching Funds / Funds other than AYK SSI:** [Matching funds or cost-sharing is encouraged but not required for this program. However, proposals must reflect the total budget necessary to accomplish the project, including in-kind contributions and/or donations. List the source and amount of funds already secured from non-AYK SSI sources, if any, which will be applied to the proposed project. See additional information/instruction in the budget forms.]
2. **LITERATURE CITED:** [Provide complete citations for all references cited in the proposal.]

**Guidelines for Drafting Research Project Objectives**

These guidelines are designed to provide direction and assistance for drafting objectives for fishery research proposals. Clear objectives are fundamental to the project design and provide the framework for evaluating project performance.  **Many proposals do not score well due to poorly formulated objectives.**

All research projects begin with either a well-framed research question or hypothesis, from which flows the research objectives. Hypotheses are possible explanations for a phenomenon whereas predictions are what you expect to occur if a hypothesis is true. Hypotheses are not to be interpreted as statements of fact but are propositions about how the salmon system may work – a hypothesis may be true or it may be false.  A good hypothesis or research question should be narrow enough to address specific issues but not so narrow that it can be addressed with a “yes” or “no” answer or the gathering of a few statistics. Once one or more research questions or hypotheses are formulated, research objectives can be developed.

Objectives identify a pattern among a set of variables or a process to be described and can be used to evaluate research progress. Objectives should be worded to reflect or link to the research questions to be answered, the hypotheses to be tested, and the processes to be described. Good research objectives often begin with the phrase “To determine whether …”. A set of objectives are ideally related to each other. Objectives should relate directly to the research question or problem; generally, they address types of information or datasets needed to address the question or problem. They define what will be accomplished by a given point in time. Research objectives should not include descriptions of how they will be accomplished; that is objectives are **not** methodological steps (e.g., collect data, analyze data, write report). This information is presented in the methods section. When little information exists to formulate questions and hypotheses then research objectives focused on description are appropriate.

In the methods section, describe discrete, specific methods or tasks for accomplishing each objective. The methods should clearly articulate and demonstrate that they will yield the information needed to accomplish the research objectives. The figure and examples below illustrate how the methods and objectives relate to the research question or problem.

Objective 1

 Project Specific Research Question or Hypothesis

Objective 2

Objective 3

Method 1

Method 2

Method 1

Method 2

Method 1

**HYPOTHETICAL EXAMPLE #1: HYPOTHESIS-OBJECTIVES-METHODS:**

Hypothesis or Research Question:

Marine survival and growth of salmon varies due to density-dependent processes of competition and predation among salmon species and to climate change.

Objectives:

* To determine whether changes in the abundance of pink salmon and climate change are associated with changes in growth and abundance of Norton Sound chum salmon.
* To determine whether changes in the abundance of pink salmon are positively correlated with growth and abundance Unalakleet River and Kuskokwim River coho salmon.

Methods:

1. Reconstruct annual and seasonal growth indices of Kwiniuk River chum salmon, 1975-2006, based on scale pattern analysis.
2. Reconstruct Norton Sound adult chum salmon returns from each brood year using recently assembled age composition data, predictions of age composition from long-term age composition datasets, and available catch and spawning escapement data for each watershed in Norton Sound.
3. Reconstruct annual and seasonal growth indices of Unalakleet River coho salmon, 1983-2006, and Kuskokwim coho salmon, 1967-2006, based on scale pattern analysis.
4. Assemble indices of Bering Sea climate change (e.g., seasonal SST, Nome seasonal air temperature, date of ice breakup in Bering Sea, Arctic Oscillation Index, PDO, and regime shifts).
5. Etc……

**HYPOTHETICAL EXAMPLE #2: RESEARCH QUESTION-OBJECTIVES-METHODS:**

Hypothesis or Research Question:

How do ecological processes regulate population size and generate annual variability in the abundance of adult Chinook salmon?

Objectives:

* Determine whether density dependent mortality is due to mainly to competition for spawning habitat or to competition between juveniles during summer rearing.
* Determine how seasonal patterns of stream discharge and other environmental variables affect food production and the area and quality of profitable and safe feeding habitat.
* Determine how food abundance and water temperature interact to influence growth rate, energy reserves, and marine survival.

Methods:

1. Survey the longitudinal distribution and density of spawners, fry, and fingerlings to assess and select study reaches.
2. Estimate adult abundance from mark-recapture experiments, plus historic weir and tower counts.
3. Estimate total egg deposition from estimates of adult abundance and redd counts, combined with historic age-sex-length data.
4. Use bioenergetic modeling to investigate the relationship between food intake, water temperature, growth rate, and energy reserves.
5. Assemble existing date, augmented with new data, to assess stream flow, flow history, season, temperature, light intensity, turbidity, and nutrient inputs
6. Test hypotheses about the way ecological processes generate annual variations in the abundance of Chinook salmon using modeling and retrospective analysis.

**AYK SSI PROPOSAL REVIEW PROCESS ­­­ 2021**

Upon receipt, AYK SSI staff will complete an initial review of proposals for missing components and conformance to the formatting requirements below. Applications that do not conform to the requirements may not be considered for further evaluation. We will screen applicants against the federal exclusions database to ensure that proposals from ineligible organizations are not advanced for review.

The AYK SSI Scientific Technical Committee will conduct detailed technical review of proposals supplemented by external peer reviews. The Committee will evaluate proposals using the following evaluation criteria:

**Scientific Evaluation Criteria:**

1. Project Responsiveness to AYK SSI Research Priorities. Proposals will be evaluated to determine if they clearly respond to the research priorities established by the AYK SSI.
2. Soundness of Project Design and Methods. Strengths and/or weaknesses of study design will be evaluated in relation to achieving productive results.

- Has the applicant provided sufficient information to evaluate the project technically?

- Are the proposed methods and experimental design appropriate to accomplishing the objectives?

- Is the project technically feasible? What is the probability that the objectives will be achieved?

1. Capacity Building. Applicants must demonstrate they have made appropriate consultations with local communities and have planned for capacity development. Projects must include appropriate partners and contribute, to the maximum degree possible, to the capacities of local communities, organizations, and residents of the region to participate in fishery research. A plan outlining how this project will contribute to developing partnerships and building the capacity of individuals, agencies, and organizations in the region should be included. Proposers should have completed consultations with local communities or partnering organizations prior to proposal submission.
2. Coordination / Experience and Qualifications of Personnel. The experience and qualifications of the project’s principal investigator and personnel will be evaluated. Applicants must demonstrate that they are aware of other past and ongoing research related to the proposed work and discuss how they will coordinate and collaborate with related projects.
* Are the proposed research personnel and equipment appropriate to achieve the objectives? Are other types of expertise missing?
* To what degree are the investigators qualified by education, training, and/or experience to conduct the proposed research?
* Does the proposal demonstrate awareness of similar work being conducted elsewhere?
1. Project Costs / Timeline. The justification and allocation of the budget in terms of the work to be performed will be evaluated. Unreasonably high or low project costs will be taken into account.
* Is the budget appropriate for the research proposed?
* What is the probability that the objectives will be achieved in the time frame proposed?

**Guidelines for Capacity Building in AYK SSI Research Program**

Within the AYK SSI research program capacity building refers to “*….the process by which rural/ Tribal groups, organizations, and NGO’s expand and develop technical and administrative abilities enabling them to participate in a range of fisheries research activities to the maximum level they desire.”*

Projects must include appropriate partners and contribute, to the maximum degree possible, to the capacities of local communities, organizations, and residents of the region to participate in fishery research. Proposers must list the communities that may be affected by the project or realize benefits from the project and describe consultations have been conducted as part of planning of the proposed work?  A plan should be described for how this project will contribute to developing partnerships and building the capacity of individuals, agencies, and organizations in the region.

The graphic below illustrates a continuum of capacity building as measured by levels of local or regional organizational involvement in research projects and will be used to evaluate the Capacity Building criterion above. Investigators are encouraged to develop the highest level of community and regional involvement that is reasonably practical to their project. Proposals that involve high levels of community involvement will rank high for this component. Not all research methods or projects lend themselves to contributing to regional or local capacity building.

*Capacity Building as Measured by Levels of Community Involvement in AYK SSI Projects 1*



*1. Cannon, R., A. Craver, M. Rearden, T. Roettiger, C. Schleusner, B. Spangler, P. Wheeler, and D. Wiswar.  2005. Capacity Building in the Fisheries Resources Monitoring Program:  A Guiding Document for Project Investigators.  U.S. Fish and Wildlife Service, Office of Subsistence Management, Anchorage, Alaska. 6 p.*