



# United States Department of the Interior

## NATIONAL PARK SERVICE

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## WRANGELL-ST. ELIAS NATIONAL PARK AND PRESERVE RESOURCE STEWARDSHIP AND SCIENCE REPORT

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### Successful Project Proposals for Copper River Sockeye Salmon Research

Recent low returns of Copper River (CR) sockeye salmon have raised concerns among Federal subsistence users and others about the status and management of CR sockeye salmon stocks. Given these concerns, and recognizing the complex ecology of CR sockeye, since 2018 Wrangell-St. Elias staff have worked with several collaborators to develop proposals for high-priority research projects that focus on these issues. Three proposals developed in collaboration with ADF&G, the University of Alaska Fairbanks, Prince William Sound Science Center, and the Native Village of Eyak have been selected to receive National Park Service (NPS) funding in years 2022-2025 and are described briefly below.

1. **Apply Genetic Analysis of Copper River Sockeye Salmon Stocks to Inform In-Season Decision Making.** The overall goals of this 3-year (2022-2024) project are to (1) evaluate the use of in-season genetic analysis as a tool for estimating the stock composition of sockeye salmon harvests in Copper River fisheries, and (2) inform real-time fisheries management decisions designed to ensure long-term health and sustainability of Copper River salmon stocks and associated fisheries. In-season stock composition information will aid fishery managers in minimizing the risk of fishery management decisions to small and/or sensitive stocks while maximizing sustainable harvest of

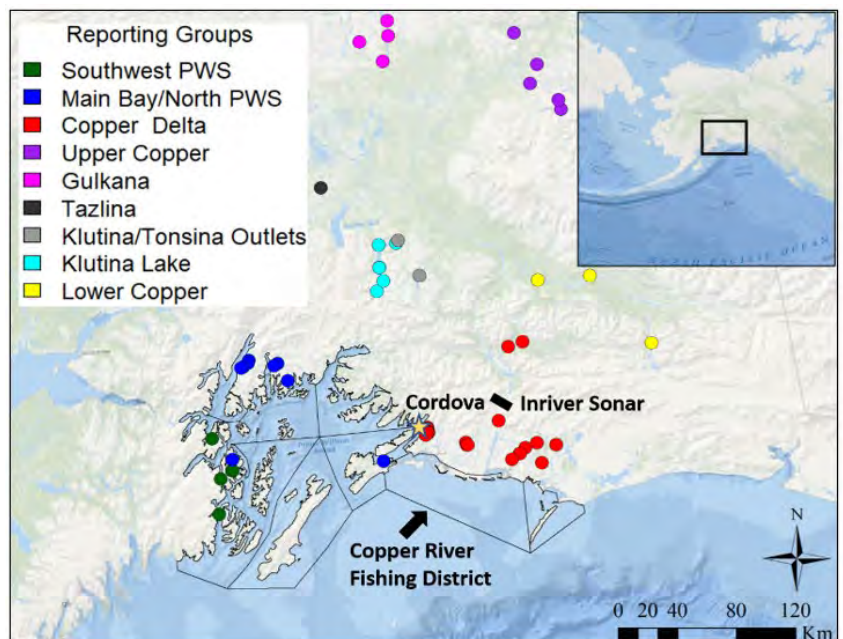


Figure 1. Prince William Sound and the Copper River watershed located in southcentral Alaska. Points indicate sockeye salmon populations in the genetic baseline and associated stock reporting groups. (Figure courtesy of Kyle Shedd and Stormy Haught, ADF&G.)

abundant stocks. Collaborators include the ADF&G Gene Conservation Laboratory, Division of Commercial Fisheries, and Division of Sport Fish; and Wrangell-St. Elias. The Ahtna Intertribal Resource Commission (AITRC) will contribute to project implementation by assisting ADF&G with the collection of samples from fisheries in the Chitina and Glennallen subdistricts. In addition to the research and management components, this project includes an interpretive component involving educational outreach to local communities and subsistence users about the collaborative application of scientific information to inform management decision making.

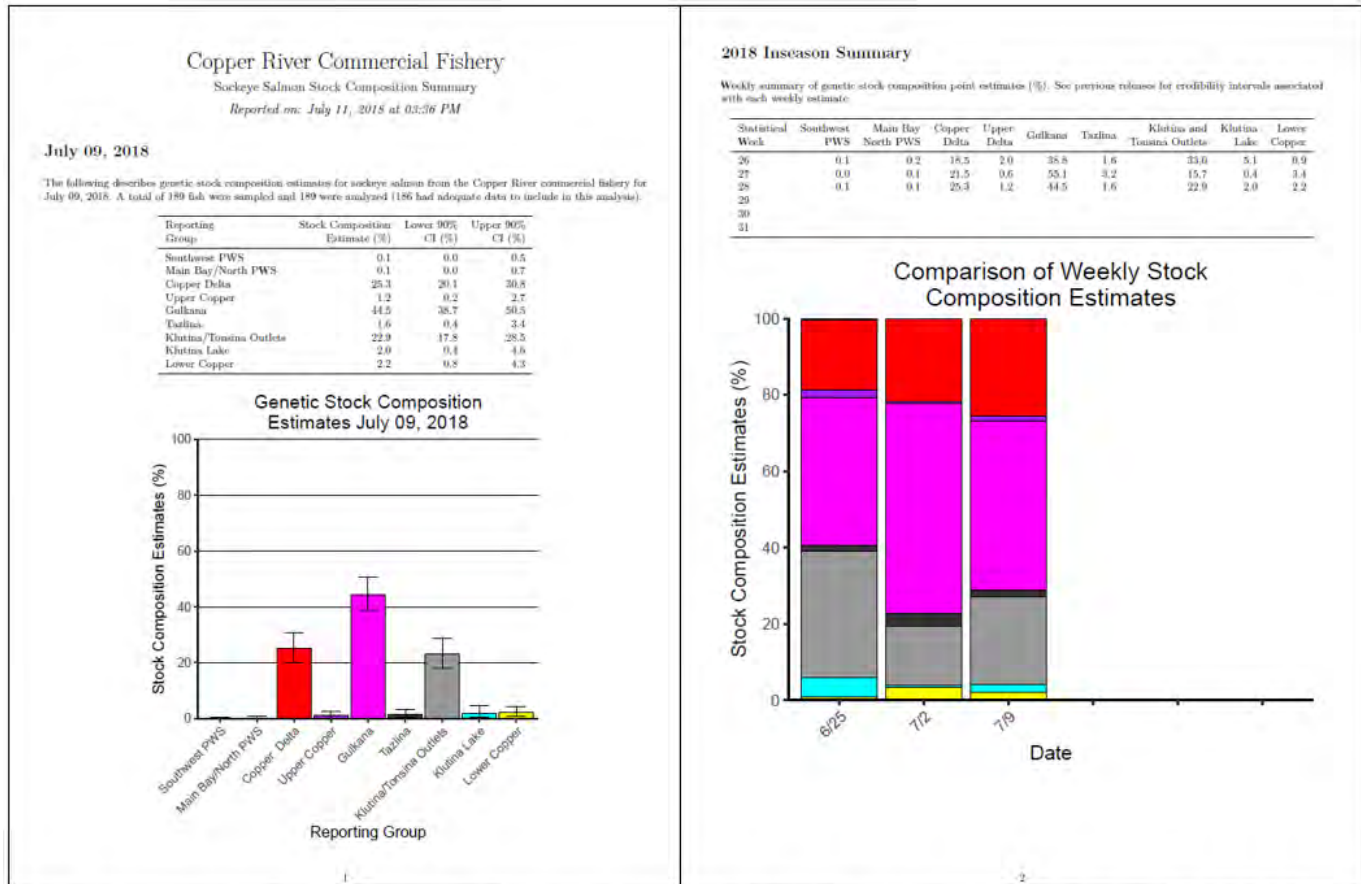


Figure 2. In-season genetic stock composition estimates as reported to ADF&G fisheries managers in 2018. On the left are the stock composition results from samples collected from the commercial harvest on 7/9/2018, while on the right are the results from three separate sampling dates to illustrate differences in stock composition over the course of the season. (Figure courtesy of Kyle Shedd and Stormy Haight, ADF&G.)

- 2. Examine Health Metrics of Copper River Sockeye Stocks to Inform Management Decision Making.** Building upon the stock genetics project (above) and other ongoing research conducted by project collaborators, this 3-year project (2023-2025) will characterize the health and energetic status of genetically determined sockeye salmon stocks to develop a better understanding of *escapement quality*. Aspects of escapement quality include body size and energy content (important factors that affect migratory success), sex ratio, and the appropriate distribution of spawners among different stocks in the watershed. Differential survival of CR sockeye stocks due to changes in body size, energy content, physiological quality, migration difficulty, and harvest pressure may leave some stocks more vulnerable to environmental changes than others, potentially increasing mortality risk. A better understanding of health metrics that correlate with stock-specific vulnerability and mortality risk can help fishery managers mitigate these issues by adjusting gear size, run timing closures, or harvest

limits to ensure all stocks achieve sustainable escapement levels, while also providing adequate harvest opportunities. Collaborators include the University of Alaska Fairbanks (UAF), Prince William Sound Science Center (PWSSC), ADF&G, and Wrangell-St. Elias. AITRC again will contribute to project implementation by assisting ADF&G, PWSSC, and UAF with sample collection. This project also includes an interpretive component that builds upon the educational outreach associated with the stock genetics project.

3. **Describing and Modeling Factors Affecting Migratory Success of Copper River Sockeye Salmon.** This 2-year project (2022-2023) aims to develop a better understanding of how environmental changes in the Gulf of Alaska and the Copper River watershed may impact spawning migration success by sockeye salmon under future ecological scenarios. Researchers will integrate prior and ongoing radio-telemetry data on Copper River sockeye spawning migration with several long-term ADF&G data sets to develop forecasting models for sockeye that will incorporate new information from a recently available hydrological model developed by the U.S. Geological Survey. Collaborators include PWSSC, UAF, ADF&G, the Native Village of Eyak, and Wrangell-St. Elias.

## Contaminated Site Management

The NPS continues to plan for implementation of cleanup activities at the Nabesna Mine Site and the Kennecott Mines and Mill Town Site pursuant to the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA). In conjunction with these planning efforts, in May 2021 Wrangell-St. Elias established web pages for the Nabesna and Kennecott projects. Each web page provides links to a Community Involvement Plan, the project Administrative Record, and other project-related information.

- Nabesna Mine Site Environmental Investigation Project  
<https://www.nps.gov/wrst/learn/management/nabesna-mine-site-environmental-investigation-project.htm>
- Kennecott Mines and Mill Town Site Environmental Investigation Project  
<https://www.nps.gov/wrst/learn/management/kennecott-mines-and-mill-town-site-environmental-investigation-project.htm>

## Strategic Planning

Park staff and collaborators from the NPS Alaska Region, the NPS Inventory and Monitoring Program, the NPS Climate Change Response Program, and the U.S. Geological Survey have initiated a project to develop a *Resource Stewardship Strategy* for the park. Preparatory work was initiated in 2020 and most of the project is to be conducted in 2021 and 2022. A Resource Stewardship Strategy is a long-range dynamic planning tool for a national park unit to set specific goals and track progress in achieving its desired natural, cultural, and subsistence resource conditions. As part of the planning portfolio, the Resource Stewardship Strategy serves as a bridge between the park unit's foundation document, other plans, and everyday management of its natural and cultural resources.

A Resource Stewardship Strategy establishes a framework and a coordinated process for:

1. Evaluating and summarizing existing information about park resources (including key issues, stressors, and threats);
2. Using science and scholarship to establish stewardship goals for park resources and values;

3. Integrating natural and cultural resource management; and
4. Determining the stewardship activities needed to achieve stewardship goals.

This framework provides a basis for informed strategic planning and sets the groundwork for preparing and implementing plans and activities to address resource management needs. Establishing this strategic approach increases management resiliency to staff turnover and guides the park unit to allocate funds and personnel to the most critical resource management needs.

During summer 2021 and continuing this fall, park staff and collaborators have been working with the NPS Climate Change Response Program to evaluate implications of alternative future climate scenarios on key park resources, including subsistence resources. The purpose of this *scenario planning* exercise is to consider the resource implications of a full range of plausible future climate conditions rather than focusing on one single scenario that is considered most likely. This type of planning approach explicitly acknowledges uncertainty and provides a foundation for adaptation.

For more information about the application of climate change scenarios to park planning, see the following link –

Link: <https://escholarship.org/content/qt76p7m8rz/qt76p7m8rz.pdf>