

Kodiak Regional  
Aquaculture Association

Kodiak Regional Aquaculture Association  
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# MESSAGE FROM THE EXECUTIVE DIRECTOR

In recent years, as I've worked to summarize KRAA's achievements and activities for our Annual Report, there has been one consistent theme: the challenges of the season. The last 5 years have been exceptional in many ways, and 2019 did not deliver a return to "normalcy" by any stretch. In fact, 2019 simply provided the latest in exceptional and unprecedented circumstances we have seen in this recent period. It seems that the concept of a "normal" season, "normal" weather, "normal" currents or temperatures or fish size or fish health, have all gone out the window. How do we prepare for the next new challenge or determine if this year's circumstances represent a "new normal" with some level of predictability? Not to be a pessimist, but we can't. What we can do is continue to be adaptable, continue to be inventive, and chalk up each challenge as something we will never have to experience for the first time again.

The challenges of the last several years have certainly brought many firsts. 2019 brought some of those together for a one-two punch and delivered a drought, unprecedented water temperatures, and fish that were often described as "confused" or "disoriented" in addition to being late and reluctant to come in. All over Alaska, it was the stories that did come in: tales of fish dying in the warm water, before they ever got to the spawning grounds. Lack of fresh water, whether warm or cold, was an added factor that had fish pinned to the shorelines at the merest whiff of fresh water seeping out of the rocks or

cliffs. Many rivers and streams simply didn't exist. Runs failed to materialize. Fish turned dark, milling around, occasionally, it appeared, exhausted by the heat, before they could find a place to ripen and spawn. KRAA, too, experienced new challenges in 2019: skewed male-to-female ratio among chums at Kitoi Bay Hatchery; unprecedented water temperatures at Pillar Creek that killed off the early run sockeye; low returns and never-before documented pathogens.

It's a startling array of circumstances, and some of the stories from around Alaska and from Kodiak were disheartening if not downright scary. And yet, there are bright spots, too, as these stories and the challenges they presented also took place among a near-record pink salmon fishery for Kodiak Island. The value of the commercial salmon fishery in Kodiak was among the top 5 in KRAA's history based on the calculation for the Salmon Enhancement Tax contributed by salmon permit holders in 2019. KRAA was able to meet goals for pink and coho, and for some late run sockeye projects. We managed to chill enough water to keep the small number of King salmon eggs alive; for the first time, we were able to implement otolith marking for all of the pink and coho production at Kitoi Bay. In response to the unprecedented temperatures at Pillar Creek, we are working to install infrastructure that will allow us to cool the water enough to allow for egg survival in the next heat wave. We have proven that no matter the circumstances, we adapt, we continue to

make fish, and we move on to the next challenge more prepared and more resilient than we were with the last. These challenges highlight that the role of the aquaculture association remains viable. We provide opportunity in both good times and bad, we offer some level of consistency and resiliency when challenges arise, and we always strive to provide meaningful benefit to the common property fisheries of Kodiak.

Despite the challenges of 2019, staff at KRAA has worked diligently to assure the survival of the eggs they were able to place in the hatcheries and to bring along those fish already in the water. In this manner, KRAA continues to do its part to secure the future of Kodiak's fisheries and contribute to the present. It's a sure thing that 2020 will bring its own unique, new set of challenges, and KRAA will accept those, adapt where necessary,

and bring to bear all the experience these challenging years has provided. No matter the challenge, KRAA's crews and staff remain committed to putting fish in the water and making a contribution to our community and our fisheries.

Wishing all of you the best in the coming season,



Tina Fairbanks

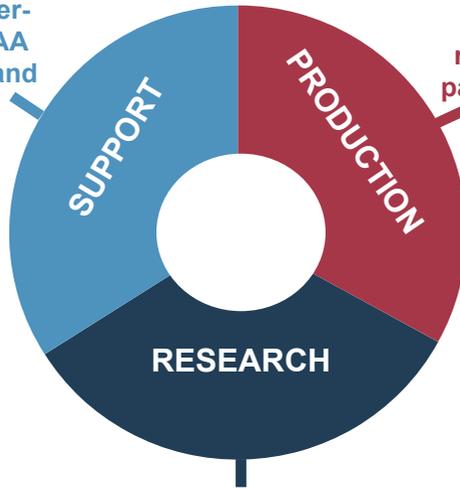
# AQUACULTURE IN KODIAK

KRAA was founded in 1983 as Kodiak's regional aquaculture association. The Association is dedicated to salmon fisheries development in the Area K Management Area for the benefit of all common property users — subsistence, sport, and commercial — through research and management efforts, habitat monitoring and protection, stocking, enhancement and rehabilitation projects. KRAA further promotes respect for Kodiak Area salmon resources through science, education, and partnership programs.

## **KRAA SERVICES**

- Salmon Hatchery Management
- Fisheries Development
- Enhancement and Rehabilitation
- Habitat Monitoring and Protection
- Fishing Opportunity
- Science Education
- Community Outreach
- Fisheries Research

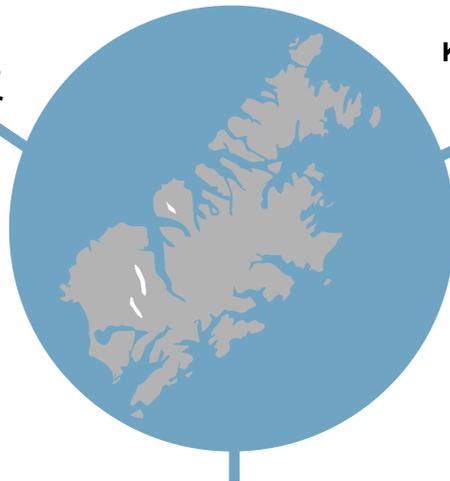
The KRAA Administration handles all of the necessary day to day business operations and ensures KRAA is adhering to all state and federal regulations.



Kitoi Bay and Pillar Creek hatcheries annually collect salmon eggs and rear fry and smolt of all 5 pacific salmon species, including rainbow trout.

Research and Monitoring biologists monitor and evaluate KRAA hatchery programs as well as wild salmon habitats.

KRAA provided educational opportunities for nearly 200 students.

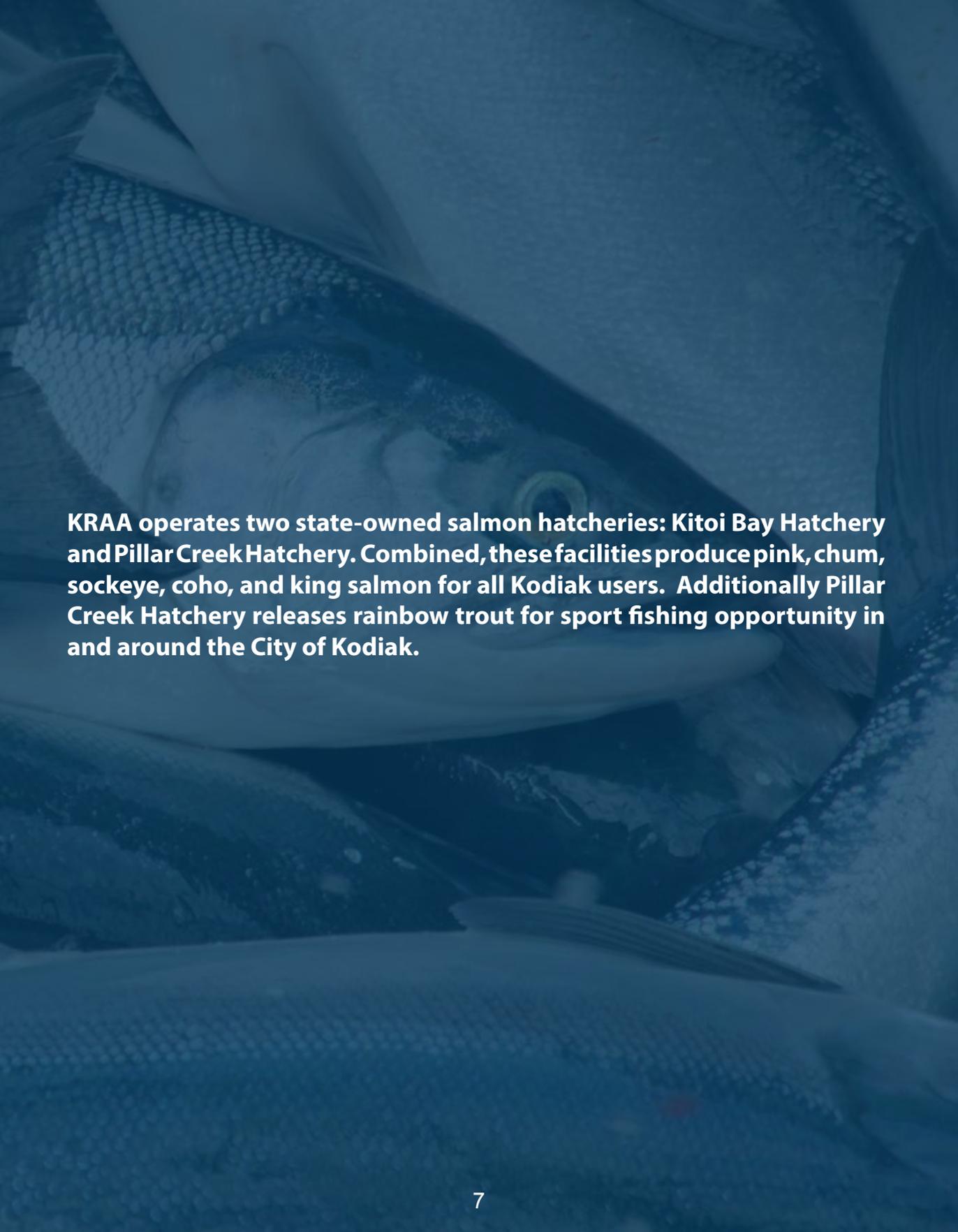


KRAA-produced salmon made up 10% of the 2019 Kodiak common property commercial fishery.

Data at over 25 salmon-producing habitats was collected by KRAA researchers.



# HATCHERY PRODUCTION



**KRAA operates two state-owned salmon hatcheries: Kitoi Bay Hatchery and Pillar Creek Hatchery. Combined, these facilities produce pink, chum, sockeye, coho, and king salmon for all Kodiak users. Additionally Pillar Creek Hatchery releases rainbow trout for sport fishing opportunity in and around the City of Kodiak.**

# KRAA HATCHERIES

Kitoi Bay Hatchery (KBH) is located on Afognak Island on the west side of Izhut Bay approximately 48 km (30 miles) north of the City of Kodiak. The hatchery infrastructure was constructed in 1954 by the U. S. Department of the Interior, Fish and Wildlife Service, but was destroyed in the 1964 earthquake and rebuilt by the Alaska Department of Fish and Game in 1965.

The hatchery was initially designed as a sockeye salmon research facility. By 1976, hatchery production priorities had switched to pink salmon fisheries enhancement. The present goal of the facility is to provide enhanced common property salmon fishing opportunities for Kodiak Management Area (KMA) fishermen by increasing returns of pink, chum, coho, and sockeye salmon through broodstock development, egg takes, incubation, hatching, rearing, and releasing juvenile salmon, primarily to the Kitoi Bay area. KBH’s primary contribution is to KMA commercial fisheries. Secondary

user groups (in terms of the number of salmon harvested) of hatchery production include subsistence and recreational fishermen.

Pillar Creek Hatchery (PCH) was constructed in 1990 as a cooperative project between ADF&G and KRAA. PCH is owned by the State of Alaska and is located on Kodiak Island Borough land that is leased to the State. KRAA operates the facility under an agreement with the State through ADF&G.

PCH was designed as a central incubation facility where salmon eggs needed for production are collected from brood sources located at sites remote from PCH and transported to the facility for incubation, hatching, and rearing of resulting juvenile fish. Most juvenile fish are then transported to and released at stocking sites remote from PCH.

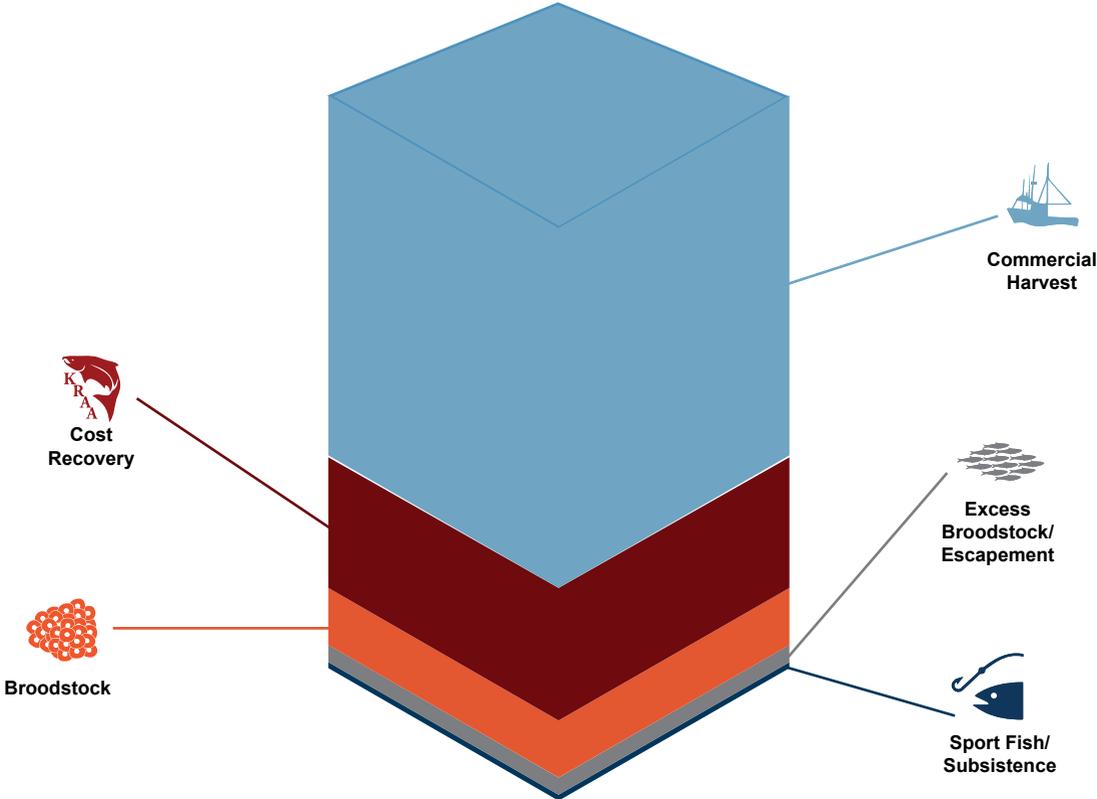
## PERMITTED EGG CAPACITY

|     | King | Sockeye | Coho | Pink   | Chum  | Rainbow | Total  |
|-----|------|---------|------|--------|-------|---------|--------|
| KBH | 0    | 0.85    | 2.30 | 215.00 | 36.0  | 0       | 254.15 |
| PCH | 0.45 | 20.00   | 0.50 | 0.0    | 0.0   | 0.20    | 21.15  |
|     | 0.45 | 20.85   | 2.80 | 215.00 | 36.00 | 0.20    | 275.30 |

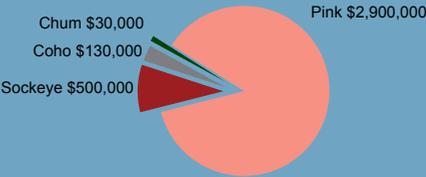
in millions

# KRAA DISTRIBUTION

In 2019, the majority of KRAA-produced salmon (64%) were harvested by the Kodiak common property commercial fisherman.



About 3.4 million hatchery-produced salmon were harvested in the Kodiak common property commercial fishery in 2019, worth an estimated value of \$3.56 million (8.5% of total Kodiak value).



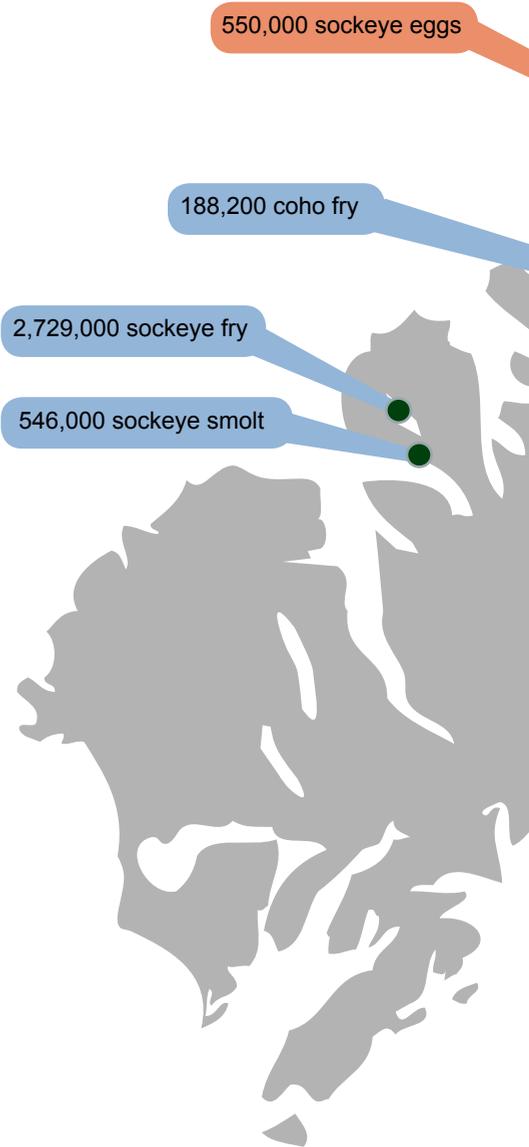
# EGG COLLECTIONS

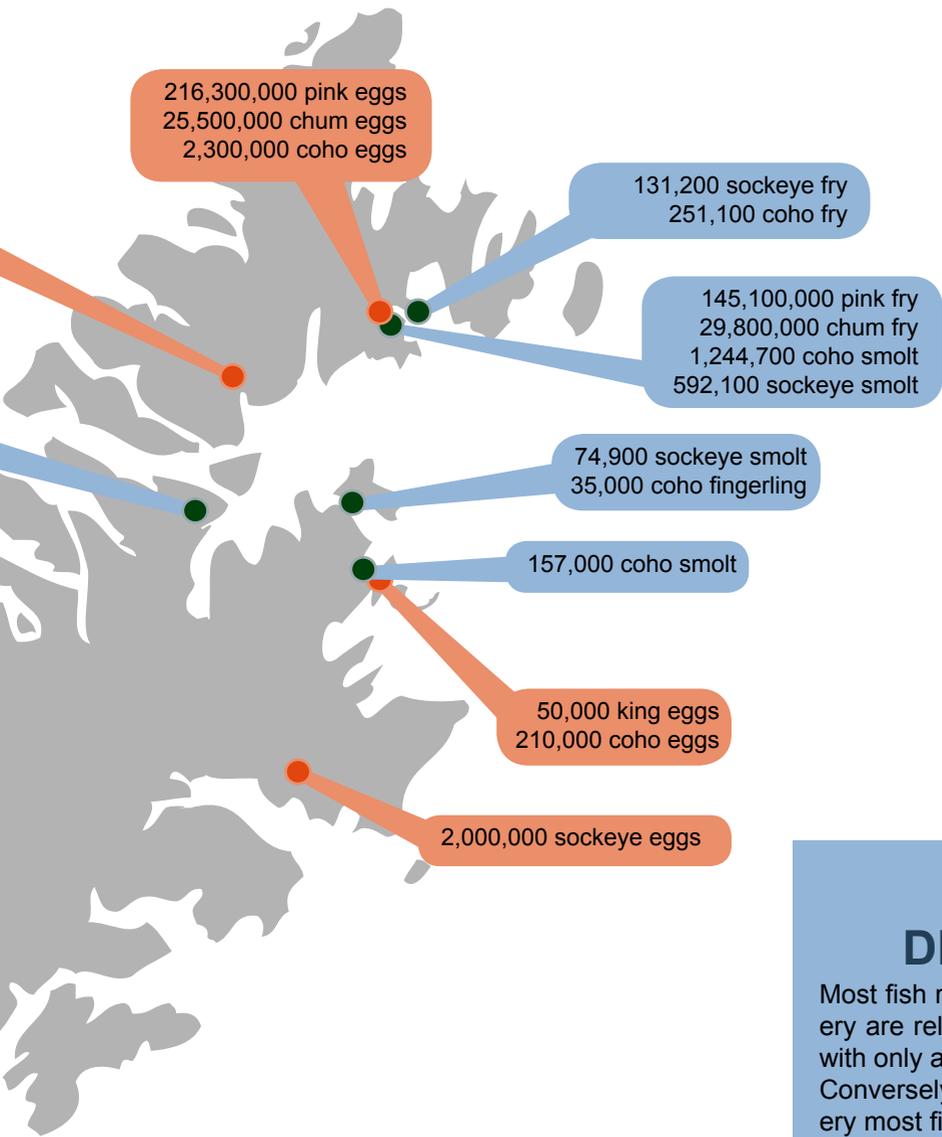


The two hatchery facilities operated by KRAA were designed for very different applications. Kitoi Bay Hatchery releases the bulk of its production directly into Kitoi Bay while Pillar Creek Hatchery was designed primarily as a central incubation facility with the intention that production would originate from places like Afognak and Saltery lakes and be stocked into barren lakes remote from the hatchery facility. The differing concepts behind the facilities create widely different strategies and practices in egg collection.

With returns coming directly to the hatchery and releases in close proximity, production from Kitoi Bay Hatchery can be relatively consistent on an annual basis—provided broodstock is available. On the other hand, sockeye salmon projects at PCH tend to have more variability. Many of the 2019 sockeye egg-take goals were based on the recommended 2020 juvenile release figures for each lake stocking project. Some of the recommended stocking figures are based on an in-season assessment of each lake's zooplankton population. As zooplankton levels vary, so do stocking recommendations.

In 2019, sockeye salmon eggs were successfully collected at Afognak Lake despite the challenging environmental conditions. However, incubation water temperatures at Pillar Creek Hatchery exceeded 17C and the eggs were lost.





## RELEASE DISTRIBUTION

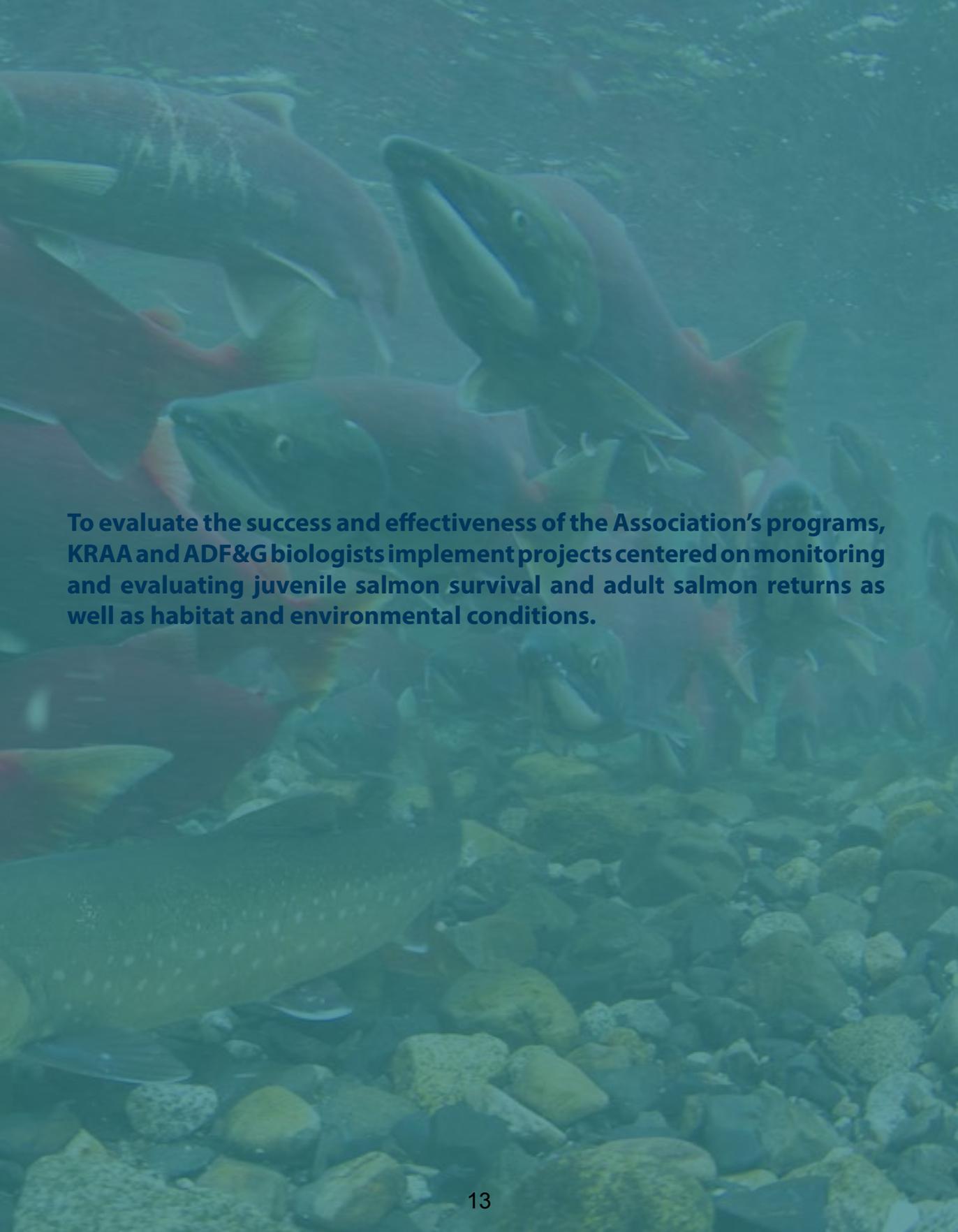
Most fish reared at Kitoi Bay Hatchery are released right at the facility, with only a few outstocking projects. Conversely, at Pillar Creek Hatchery most fish are released remotely, with only some coho smolt released directly into Pillar Creek.



KBH used 370,442 lbs (168,020 kg) of fish food to produce 549,979 lbs (249,466 kg) of pink and chum salmon fry.

An underwater photograph of a school of salmon swimming in a river. The fish are silvery with a pinkish-red hue, typical of salmon during their spawning season. They are swimming over a rocky riverbed. The water is clear, and some green aquatic plants are visible in the upper left corner. The overall scene is captured in a slightly desaturated, teal-green color palette.

# RESEARCH AND MONITORING

An underwater photograph of a large group of salmon swimming in a river. The fish are seen from above, swimming towards the bottom. The water is clear, and the riverbed is composed of many smooth, rounded rocks of various sizes and colors, including shades of grey, brown, and tan. The lighting is natural, creating a slightly dim and blue-tinted atmosphere typical of underwater environments. The salmon have silvery sides and some show hints of pink or red, particularly on their heads and tails.

**To evaluate the success and effectiveness of the Association's programs, KRAA and ADF&G biologists implement projects centered on monitoring and evaluating juvenile salmon survival and adult salmon returns as well as habitat and environmental conditions.**

# FISHERIES MONITORING

## **SPIRIDON LAKE/TELROD COVE**

Annual sockeye salmon smolt emigrations from Spiridon Lake are enumerated and sampled for age and size to assess growth, juvenile survival and smolt-to-adult survival. Additionally, sockeye salmon harvested in the Spiridon Bay Special Harvest Area (SBSHA), located at Telrod Cove, are monitored by KRAA staff from mid-June to early August. Monitoring duties include estimating the build-up of returning sockeye salmon, estimating and sampling the sockeye salmon harvest, and estimating the incidental harvest. KRAA also collects otoliths from sockeye harvested inside Telrod Cove and sockeye harvested in adjacent statistical areas. These collections will continue over the next several years and will allow KRAA to evaluate the success of the sockeye smolt net pen project as well the overall contribution of the Spiridon Lake fry release.

## **HIDDEN LAKE/FOUL BAY**

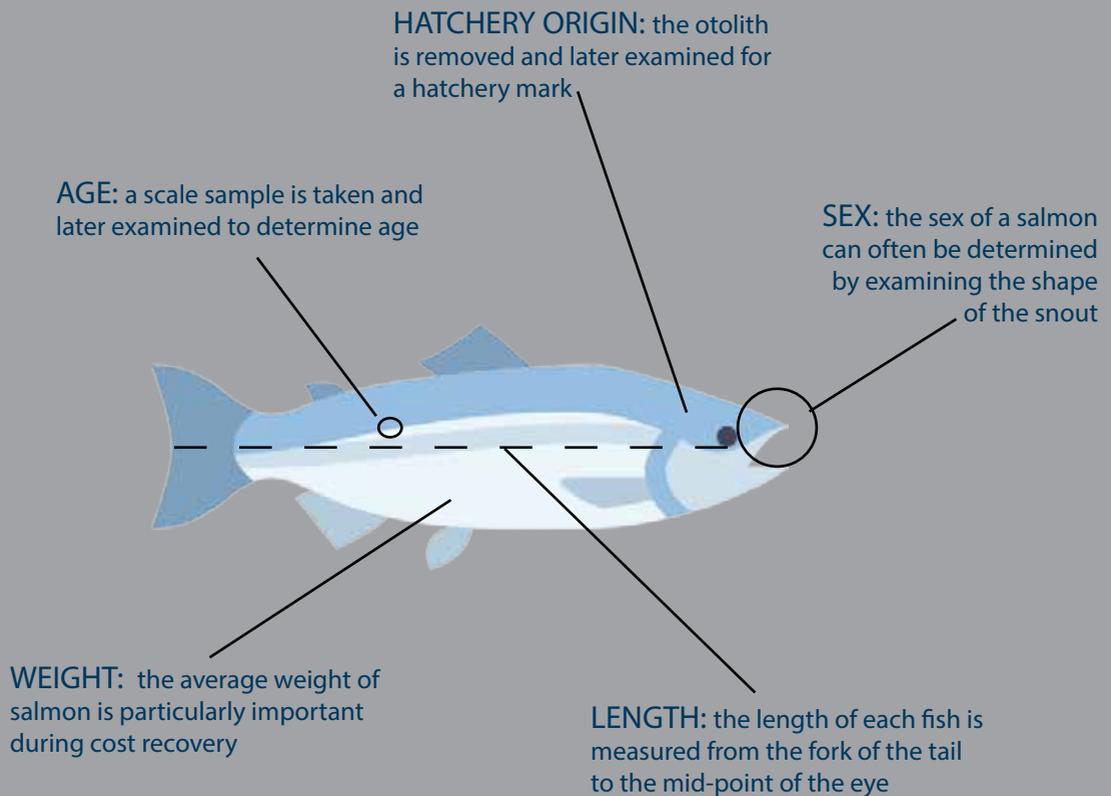
Sockeye salmon returning to Foul Bay are harvested in the Foul Bay Special Harvest Area (FBSHA). Through KRAA funding, ADF&G annually monitors the commercial harvest and collects scale samples. Lake limnology data is collected to evaluate the response of the lake's zooplankton community to predation by stocked juvenile salmon and to determine stocking levels. Additionally, freshwater growth and fry-to-adult survival data are collected and evaluated.

## **SALTERY RIVER**

KRAA provides funding and personnel to ADF&G to install and operate the weir at Saltery Lake on an annual basis. Once escapement goals are met, KRAA can utilize adult sockeye salmon for Pillar Creek Hatchery broodstock. Saltery sockeye are targeted by subsistence, sport and commercial fishermen.

# FISHERIES DATA COLLECTION:

KRAA Field Technicians collect important information from individual salmon that allow biologists to calculate survival rates, create run reconstructions, and estimate future returns.



In 2019, KRAA continued to collect sockeye salmon otoliths from Telrod Cove and various statistical areas on the West side. The analysis of these otoliths will indicate the varying survival between fish released in Spiridon Lake and those released directly from saltwater net pens in Telrod Cove. The ultimate goal is to evaluate the success of the net pen project. In addition to the sockeye otoliths, chum salmon otoliths were collected at Kitoi Bay Hatchery. This analysis will help evaluate the success of the late-large program. All otoliths are analyzed by KRAA personnel at the KRAA lab on Near Island.

# LIMNOLOGY PROGRAM

Limnology data collection from Kodiak lakes began in the early 1980's. KRAA, in a cooperative agreement with ADF&G, has provided the funding for the majority of limnology data collection and processing since 1991. In 2019, KRAA collected samples from over 20 lakes and contracted with ADF&G for water chemistry and zooplankton analysis. Limnological data collected at Buskin Lake is done cooperatively with the Sun'aq Tribe of Kodiak (STK).

Most lakes in the Kodiak area are accessible only by float plane. Samples collected while working off the floats include zooplankton net hauls, water samples, temperature and dissolved oxygen profiles, and light incidence measurements. In the laboratory, zooplankton is measured and enumerated under the microscope

and water samples can be analyzed for pH, alkalinity, chlorophyll a, and nutrient content.

ADF&G uses limnology data to assess lake productivity and changes in the freshwater rearing environment of sockeye salmon. From these analyses, ADF&G provides stocking recommendations to KRAA for sockeye salmon projects.

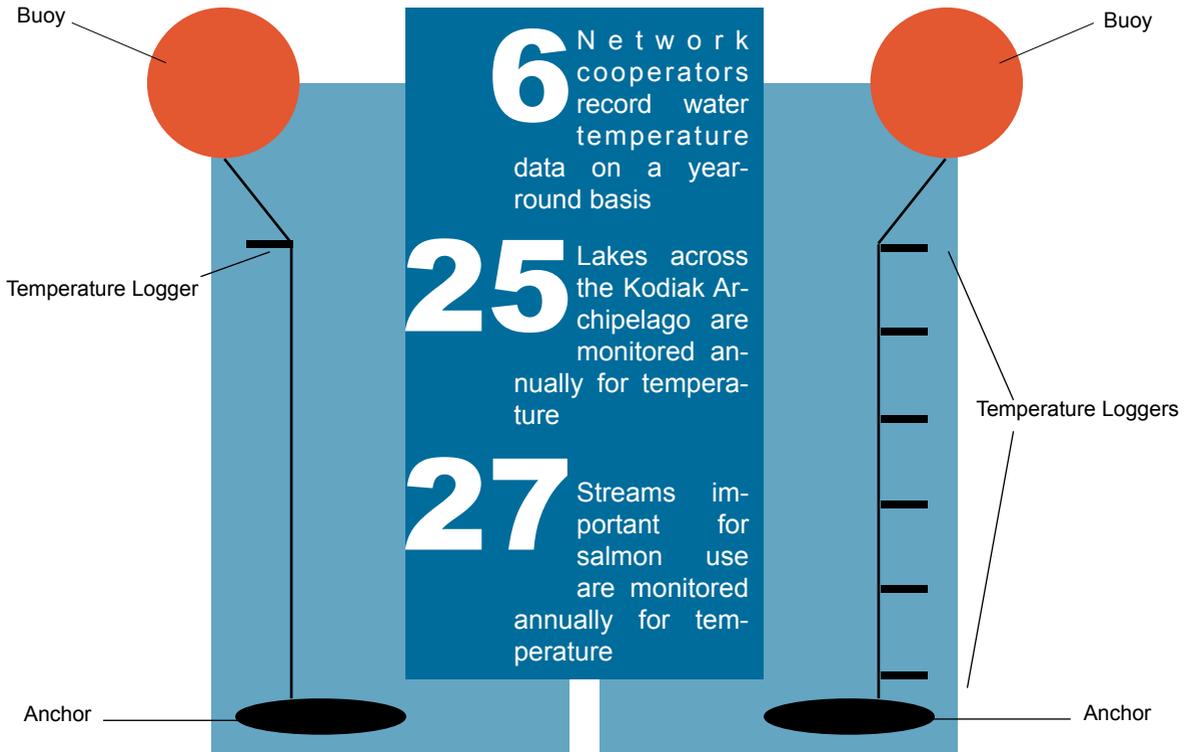
Limnology data collected on sockeye salmon nursery lakes that are not regularly stocked with salmon are archived to provide baseline information. The data is important in instances where sockeye returns begin to dwindle. The baseline limnology and zooplankton data can be used to attribute, or rule out, run failures caused by unfavorable juvenile rearing conditions.

## LIMNOLOGY LAKES

- Big Waterfall
- Buskin
- Crescent
- Dry Spruce
- Frazer
- Hidden
- Karluk
- Laura
- Little Kitoi
- Little Waterfall
- Lower Jennifer
- Lower Olga
- O'malley
- Red
- Ruth
- Saltery
- Spiridon
- Thumb
- Upper Jennifer
- Upper Malina
- Upper Olga

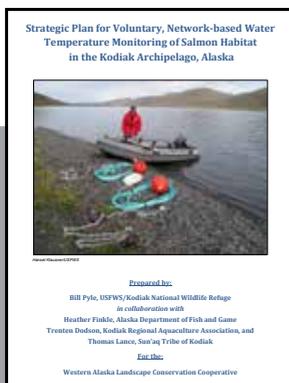
# TEMPERATURE MONITORING

Temperature plays a vital role in salmon habitat use. Over the past several years, critical areas designated as important salmon habitat have been monitored for temperature by a volunteer temperature monitoring network - that includes KRAA.



Most lake water temperature monitoring stations log recordings at 1m below the lake's surface.

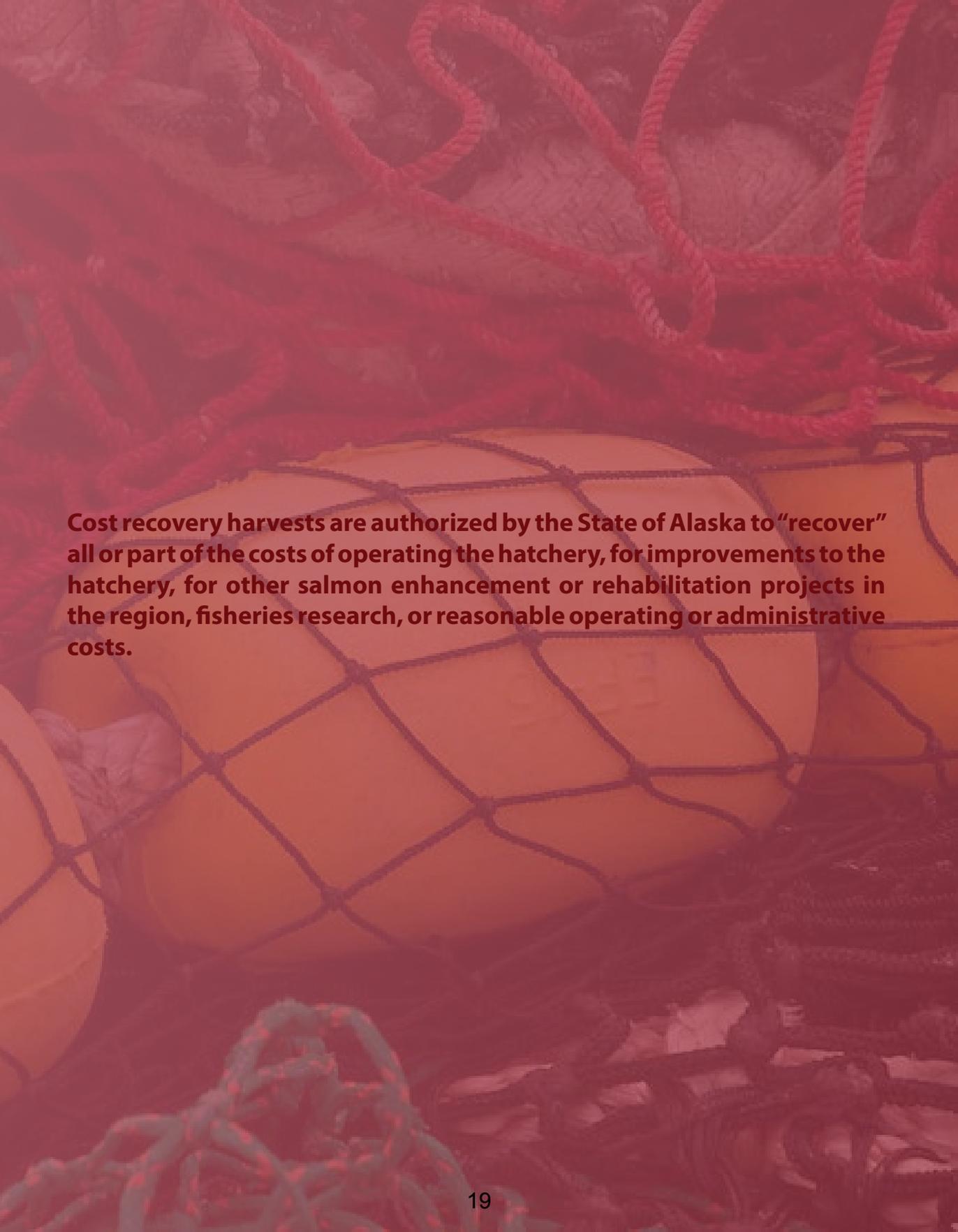
Some lake stations are set up as arrays. Logging temperature and multiple depths.



The Strategic Plan for Voluntary, Network Based-Water Temperature Monitoring of Salmon Habitat in the Kodiak Archipelago was developed jointly by the USF&WS, ADF&G, STK, and KRAA. The plan can be found on the KRAA website in the library section.

The background of the slide features a close-up, slightly blurred view of fishing equipment. In the foreground, a dark-colored fishing net with a prominent diamond-shaped mesh pattern is visible. Behind the net, there are several thick, braided ropes in shades of red and orange, which appear to be part of a larger fishing rig or boat equipment. The overall lighting is somewhat dim, creating a textured and industrial feel.

# **COST RECOVERY**



**Cost recovery harvests are authorized by the State of Alaska to “recover” all or part of the costs of operating the hatchery, for improvements to the hatchery, for other salmon enhancement or rehabilitation projects in the region, fisheries research, or reasonable operating or administrative costs.**

## **COST RECOVERY PROCESS**

Prior to the fishing season, the KRAA Board of Directors establishes cost recovery goals designed, in part, to reach funding objectives while minimizing impact on the common property fishery.

KRAA is authorized by the state to license the harvest of salmon for cost recovery in strategically designated locations called Special Harvest Areas (SHA). These areas, often located in terminal or hatchery locations, allow harvest of salmon with minimal impact on common property openings. Once the hatchery's broodstock and/or cost recovery goals are realized or within reach, salmon fishing in the SHA and associated districts may be opened again to the common property fishery by order of ADF&G area managers and Management Plans. In 2019, the Association concentrated cost recovery efforts at the Spiridon Bay and Kitoi Bay Special Harvest Areas.

### **SPIRIDON BAY SHA**

The 2019 Telrod Cove cost recovery goal was set at 250,000 pounds of sockeye salmon returning from Spiridon Lake and Telrod Cove stocking projects. The goal was not achieved.

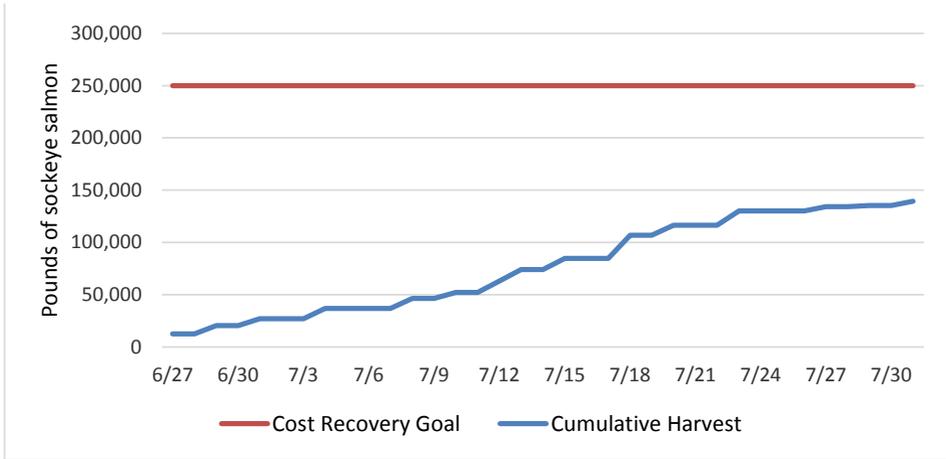
In 2019, the Telrod Cove cost recovery harvest began on June 27, 2019 and concluded on July 31, 2019. A total of 139,000 lbs. of sockeye salmon, averaging approximately 3.85 lbs. were harvested during the cost recovery fishery.

### **KITOI BAY SHA**

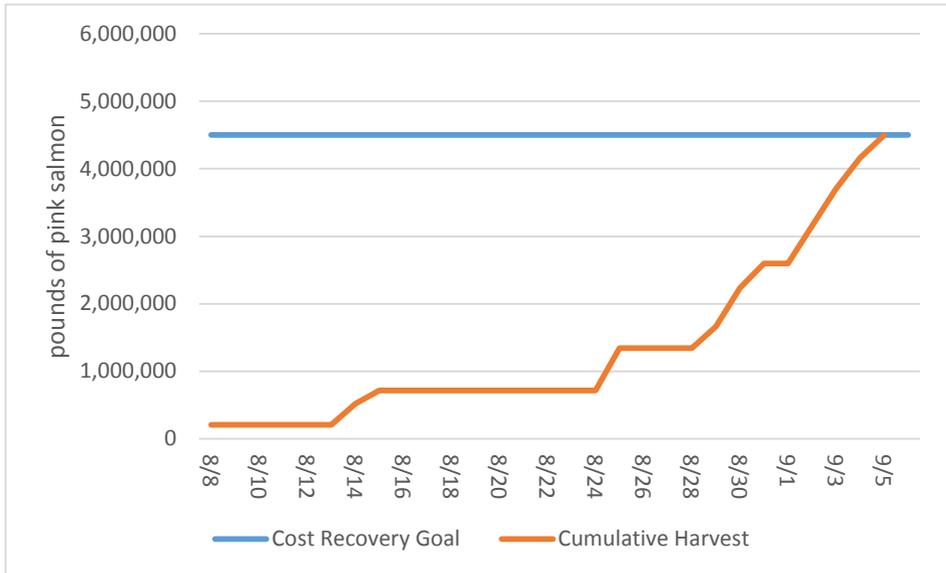
The Kitoi Bay cost recovery goal for 2019 was set at 4.5 million pounds of Kitoi Bay Hatchery pink salmon. The goal was not achieved.

Due to a late return, efforts began on August 14, 2019 and concluded on September 5, 2019 when a total of approximately 1,676,000 pink salmon averaging 2.68 lbs. had been harvested.

## TELROD COVE



## KITOI BAY



Approximately 1.7 million KRAA-produced salmon (sockeye and pink) were harvested for cost recovery.

A woman in a blue shirt is standing and talking to a group of children outdoors. The children are sitting on the ground, and the woman is leaning in towards them. The background shows trees and a body of water. The entire image has a green tint.

# **OUTREACH & EDUCATION**

A photograph showing a man in a red t-shirt and a tan baseball cap, seen from the back, gesturing towards a large fish on a white table. Two children, a girl in a yellow shirt and a boy in a green shirt and camouflage waders, are looking at the fish. The scene is outdoors with a river and trees in the background. The image has a green tint.

**Along with producing salmon, KRAA provides dynamic educational opportunities, events, and resources that advance scientific knowledge and promote stewardship of Kodiak's salmon resource. KRAA's education and outreach efforts strive to foster two-way communication and actively involve the community in salmon enhancement decisions.**

### **KODIAK COMFISH**

KRAA and Pillar Creek Hatchery provided a fish tank display and information booth during the 2019 Kodiak ComFish Trade Show. Guests at the trade show had the opportunity to engage with different KRAA staff and to discuss KRAA projects and learn more about the Association's mission and goals.

### **HATCHERY TOURS**

The staff at Pillar Creek Hatchery provided countless hatchery tours to members of the public, visitors to Kodiak, and classes from our public and private schools. Tours include a brief presentation on annual hatchery operations. Guests are also provided with an opportunity to see the different functions of the facility from incubation to rearing.

### **SALMON CAMP**

KRAA staff led salmon campers in salmon dissections this summer. Students were given an anatomy lesson that included a first-hand look at the external features of salmon as well as a look at the internal organs.

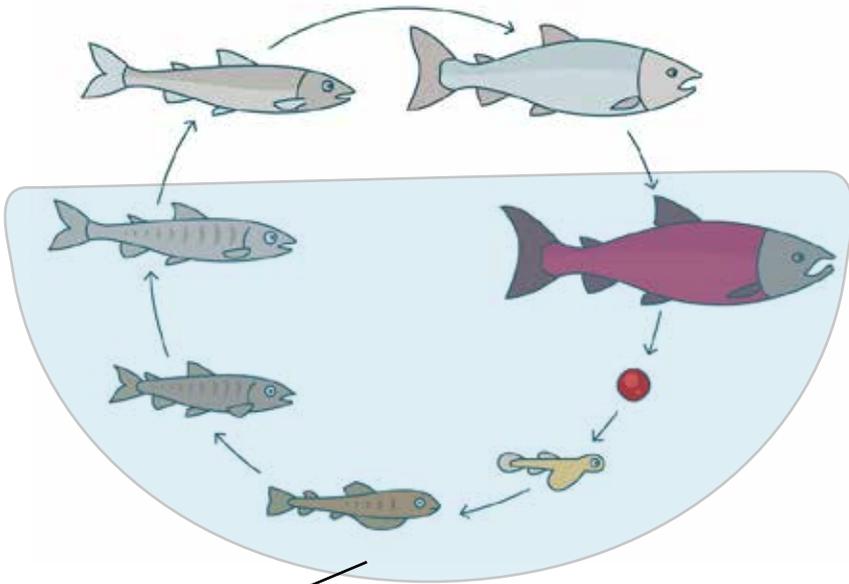
### **SALMON IN THE CLASSROOM**

During the coho egg-take activities at Pillar Creek Hatchery, KRAA staff provided an educational opportunity for local students. Following a presentation that included salmon identification, life cycle, and anatomy, KRAA staff demonstrated to students how hatchery personnel collect eggs and milt from coho salmon. Each participating class was given up to 500 coho salmon eggs to incubate in their classroom over the winter. The students track the development from egg to fry. In the spring, the resultant fry are released at Island Lake.

KRAA staff also led fourth grade students in salmon dissections later in the year. It was a great opportunity for the students to get a hands-on physiology and anatomy lesson and to get a little messy as well!

# SALMON LIFE CYCLE

Many critical steps in a salmon's life take place in fresh water. Students participating in Salmon in the Classroom and are taught the life-cycle stages and the importance of freshwater.



Spawning, incubation and rearing all take place in freshwater

## SHARK DISSECTION

KRAA staff was given the opportunity to lead students from Kodiak Middle School in a salmon shark dissection.



## 2019 KRAA STAFF

### ADMINISTRATION

**Tina Fairbanks**  
Executive Director

**Tammy Hulsey**  
Administrative Office Manager

**Megan Holland**  
Administrative Assistant

**Trenten Dodson**  
Production and Operations

### PILLAR CREEK HATCHERY

**Al Seale**  
Manager

**James "Hawk" Turman**  
Assistant Manager

**Lauren Bailey**  
Fish Culturist

### RESEARCH & MONITORING

**Nathan Weber**  
Manager

**Jodi Estrada\***  
Biologist

**Kaden Buer**  
Biologist

**Marina Thomas**  
Lab Technician

### KITOI BAY HATCHERY

**Mike Wachter**  
Manager

**Chet Thomas**  
Assistant Manager

**John Vinci**  
Fish Culturist

**Adam Ruyle**  
Fish Culturist

**Nick Allen**  
Fish Culturist

**Kayla Hensch**  
Fish Culturist

**Chuck Jorgensen\***  
Maintenance Manager

**Nate Vreeland**  
Assistant Maintenance Manager

# IN MEMORIAM



KIP THOMET

KRAA was fortunate to have the benefit of Kip Thomet's dedicated service for over 15 years. He was well known for his respectful, carefully considered opinions, his even-handed judgements, his sincerity and integrity, and the care and attention he gave to the issues that have faced the organization over the last decade and a half. He spent his final years on the KRAA Board as its Treasurer, and was committed to that added responsibility. Kip was known and loved throughout the community for his contributions to other fishing groups and his efforts to support students and athletes in Kodiak. Kip's contribution and dedication will be missed.

\*Kenny Matson (Biologist) and Mike Fairbanks (KBH Maintenance Mgr.) joined the KRAA staff in 2020 following the departure of Jodi Estrada and Chuck Jorgensen.

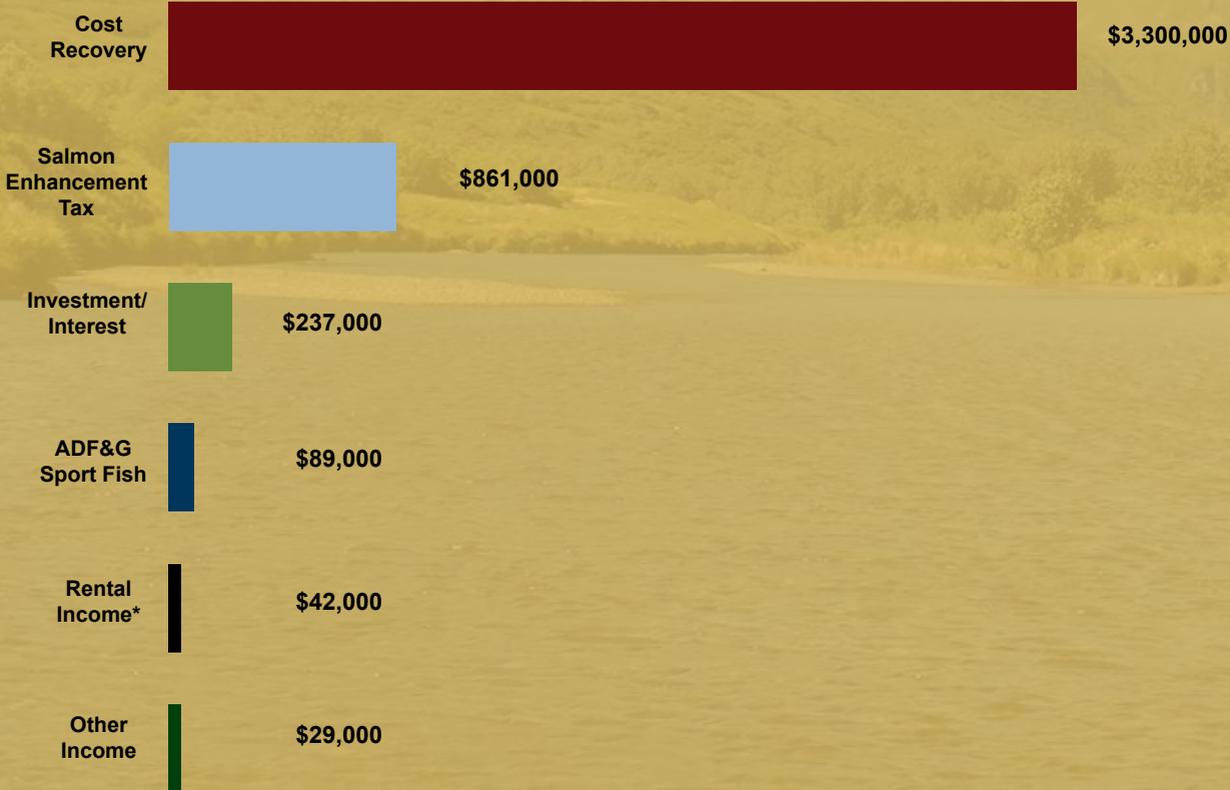
# KRAA BOARD OF DIRECTORS



Top Row: Oliver Holm, Wallace Fields, Nate Rose, Chad Aga (resigned 2020)  
Second Row: Marko Patitucci, Matt Moir, Rick Berns, Dave Hilty, Jeff Stephen  
Third Row: Steven Horn, Bryan Horn, Harvey Goodell, Melissa Berns-Svoboda  
Not Pictured: Theresa Peterson, Adam Wischer (joined 2020), Nicholas Hoffman (joined 2020)

# KRAA FINANCIALS

## INCOME



# EXPENSES

