



ANNUAL REPORT 2022

Kodiak Regional Aquaculture Association



Kodiak Regional Aquaculture Association
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KRAA MISSION

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.



A MESSAGE FROM THE EXECUTIVE DIRECTOR

You are invited. Look inside this annual report and you will find a wealth of information, but even though this report can tell you a lot, we know you may still have questions. KRAA welcomes anyone interested in knowing or learning more about the projects and programs we conduct to come down to the office or reach out to myself or other KRAA staff to ask questions about what we do. I often think there are ways we might be able to reach a larger number of permit holders directly or be more effective in getting the word out to the public on just what KRAA does—for permit holders and for the broader community—and then I wonder if everyone is not already bombarded with an excess of information these days and how much desire there is to take in more. Honestly, we want to make it easy for you, so I invite you to tell me about how you would like to be engaged. If you're reading this through, you've already become engaged, but I hope you'll take one more step and take us up on the invitation.

Your voice is welcome. We want your questions, but we want your feedback, too. This is your association, and we are here to provide benefit to all salmon user groups in Kodiak. At KRAA, we can keep doing what we are doing. We make a contribution. We think it matters. But we also aren't so limited in our vision to think that there aren't ways we can do better and, potentially, more. That's where you come in. Who knows our fisheries better than the fishers that utilize the resource? The KRAA Board of Directors is made up of fishers who have taken an interest and can use their voice to help inform the projects we conduct and any new projects we take on. If you know a Board member, you can talk to them, too. Or, we would love to see you at a meeting or hear from you by email. We hope you will let us know what your interests and priorities are.

How can we help you? We are not miracle workers, but we are certainly here to hear your ideas, concerns, questions, and even complaints. KRAA has been a part of the community since 1983. That's nearly 40 years of effort into supporting Kodiak's salmon fisheries and communities. Take a look at our website or visit one of the hatcheries. We'd like to show you what we do and talk about the kinds of projects that are important to all members of our community—commercial salmon permit holders, subsistence users, and sport anglers alike. I hope you will take a look inside, and I hope you'll take us up on these offers. We work for you.



Tina Fairbanks
KRAA Executive Director

AQUACULTURE IN KODIAK



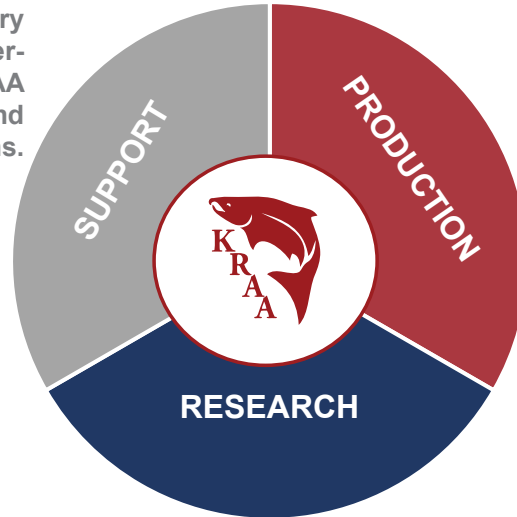
Kevin Viado

AQUACULTURE IN KODIAK

Regional aquaculture associations were originally formed in 1976 through legislative action prompted by Alaskan fishermen who lobbied for the exclusion of private enterprise from salmon fisheries development and enhancement (and the creation of the nonprofit hatchery associations—both the regional aquaculture association for each area, as well as other private nonprofit, or PNP, organizations). The ultimate goal was to give Alaskans a voice in salmon fishery enhancement decisions and a hand in actions, such as rehabilitation of weak salmon stocks or supplemental salmon production, research and educational outreach, and habitat protection and improvement.

Kodiak Regional Aquaculture Association

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 five Pacific salmon species, including rainbow trout.

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

Each association is governed by a board of directors comprised of area salmon permit holders representing each gear group as well as processing, marketing, sport fishing and other interests. The Kodiak Regional Aquaculture Association (KRAA) was officially approved by the commissioner of the Alaska Department of Fish and Game in 1983, and it has been enhancing and rehabilitating salmon runs in the Kodiak area for nearly 40 years. During its formative first decade, KRAA achieved much through lake enrichment projects, and, by 1994, supplemental sockeye production from stocking barren lakes had reached significant levels. Since then, KRAA's contribution to the Kodiak Area salmon harvest has continued to expand.

Currently, the Association is primarily funded through two avenues: cost-recovery fishery licensing revenues and a two percent salmon enhancement tax (SET) on first point-of-sale commercial salmon fisheries harvest revenues. The SET is initially paid to the State of Alaska by Area K salmon permit holders. The tax is calculated from gross revenue at the time of delivery and is held in the State of Alaska General Fund until the time of disbursement each year. SET revenues generated in Area K are disbursed annually to KRAA by the state Department of Commerce, Community, and Economic Development.

HATCHERY OPERATIONS



HATCHERY OVERVIEW

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 in partnership with ADF&G releases rainbow trout for sport fishing opportunity in and around the City of Kodiak.

Kitoi Bay Hatchery

Permitted Capacity

Pink Salmon:

215 million eggs

Chum Salmon:

36 million eggs

Coho Salmon:

2.3 million eggs

Sockeye Salmon:

850,000 eggs

Pillar Creek Hatchery

Permitted Capacity

Sockeye Salmon:

20.0 million eggs

Coho Salmon:

500,000 eggs

King Salmon:

450,000 eggs

Rainbow Trout:

200,000 eggs

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.



Kevin Viado

HATCHERY OPERATIONS



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.

Kitoi Bay Hatchery

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. However, diminished returns of sockeye salmon to Little Kitoi Lake have led to more Kitoi Bay Hatchery egg takes at Saltery Lake.



LOCATION	SPECIES	GREEN
Kitoi Bay	Chum	35,800,000
Kitoi Bay	Pink	214,000,000
Saltery Lake	Sockeye	744,400
Kitoi Bay	Coho	2,400,000

Pillar Creek Hatchery

On the other hand, egg collections at Pillar Creek Hatchery tend to have more variability. The 2022 sockeye salmon egg-take goals were based on the recommended 2023 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.



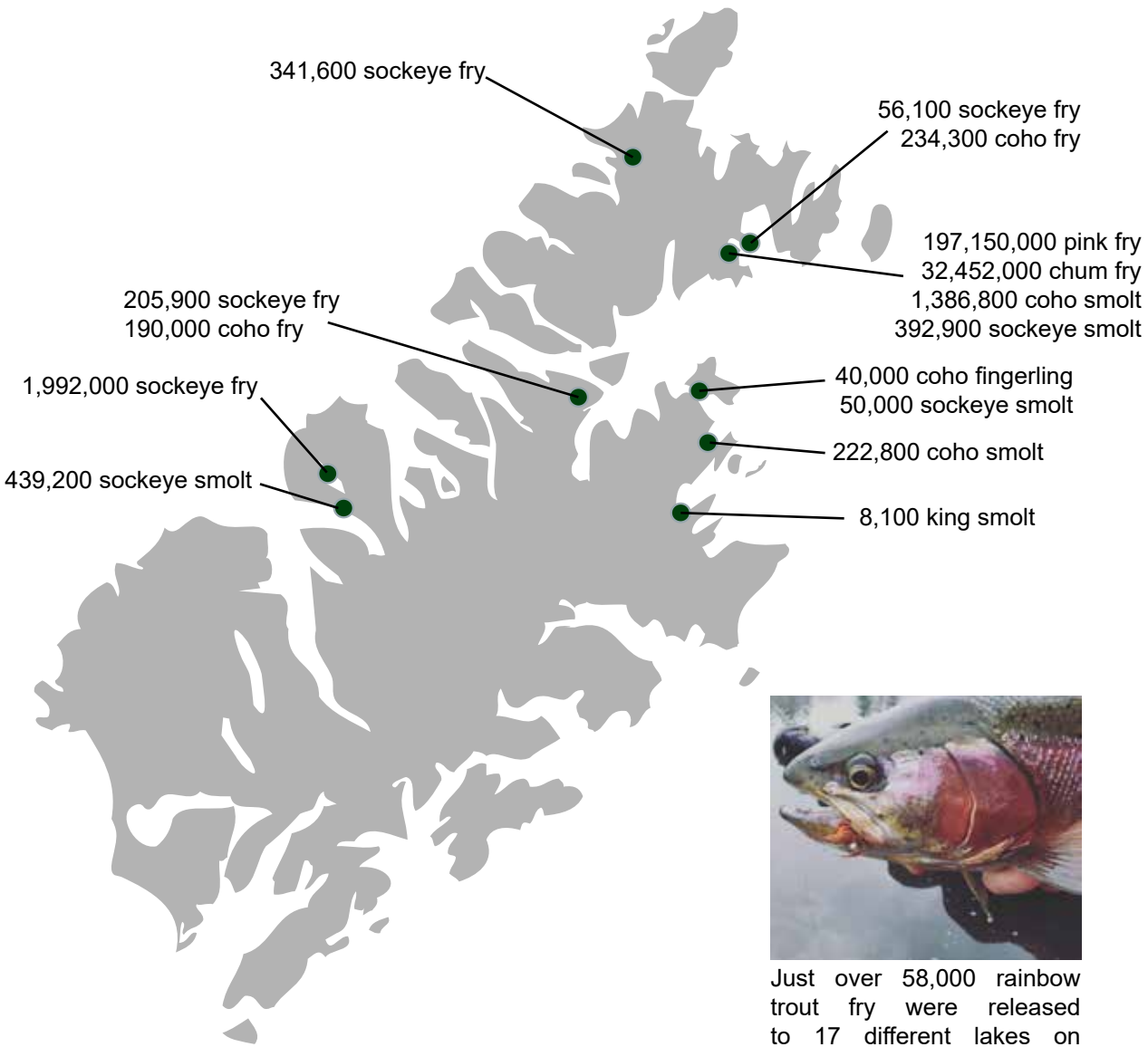
LOCATION	SPECIES	GREEN
Afognak Lake	Sockeye	558,900
Monashka	King	8,200
Saltery Lake	Sockeye	3,600,000
Pillar Creek	Coho	238,000

HATCHERY OPERATIONS



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 from the hatchery.



Just over 58,000 rainbow trout fry were released to 17 different lakes on the Kodiak Road System.



FISHERIES MONITORING

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.

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 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.





LIMNOLOGY LAB

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 2022, 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).

Limnology Program

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*
- Sallery
- Spiridon*
- Thumb
- Upper Jennifer*
- Upper Malina
- Upper Olga
- Thorshiem

*Lake stocked with sockeye fry



RESEARCH & MONITORING



OTOLITH LAB

In 2022, 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.

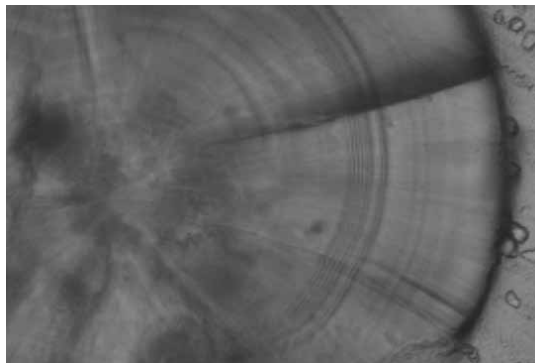
In addition to the sockeye otoliths, chum salmon otoliths were collected at Kitoi Bay Hatchery. Chum salmon otoliths were also collected from various commercial fishing statistical areas and several streams in proximity to the hatchery. This analysis will help evaluate the success of the late-large program as well as identify KRAA-released fish within the commercial harvest.

2022 marked the second year that 100% of KRAA-released pink salmon returned with



an otolith mark and the second year of the Kodiak Pink Otolith Recovery (KPOR) project. As in 2020 and 2021, pink salmon otoliths were collected from hatchery broodstock, the commercial common property harvest, and streams near the City of Kodiak and several in near proximity to Kitoi.

Otoliths collected from pink salmon hatchery broodstock are used to confirm saltwater otolith mark retention. The commercially harvested pink salmon are sampled to acknowledge KRAA's pink salmon contribution to the statistical areas outside of Kitoi Bay. Otoliths from the pink salmon sampled in the streams can indicate if hatchery-released fish have strayed from returning to Kitoi Bay. All otoliths are analyzed by KRAA personnel at the KRAA lab on Near Island.



An otolith is traditionally marked by changing the water temperature during incubation. This induces a "dark ring" in the microstructure of a fish's otolith. Usually these rings are created by a rapid temperature decline of at least 3° Celsius followed by a cold interval of 24 to 48 hours. This disrupts normal otolith growth, and when the otolith is viewed under a microscope using transmitted light, a "dark ring" is visible. This ring contrasts sharply with the adjacent, narrow "white ring," which results from the relatively warm portion of the thermal cycle.

COST RECOVERY



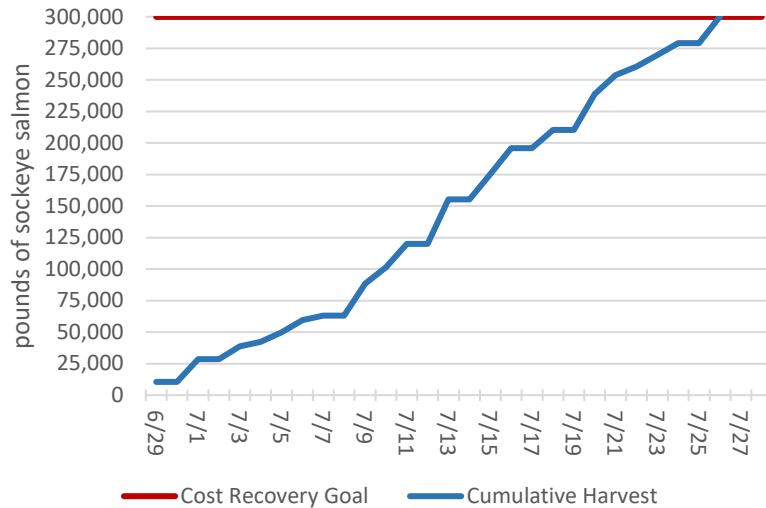
COST RECOVERY

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 2022, the Association concentrated cost recovery efforts at the Spiridon Bay and Kitoi Bay Special Harvest Areas.

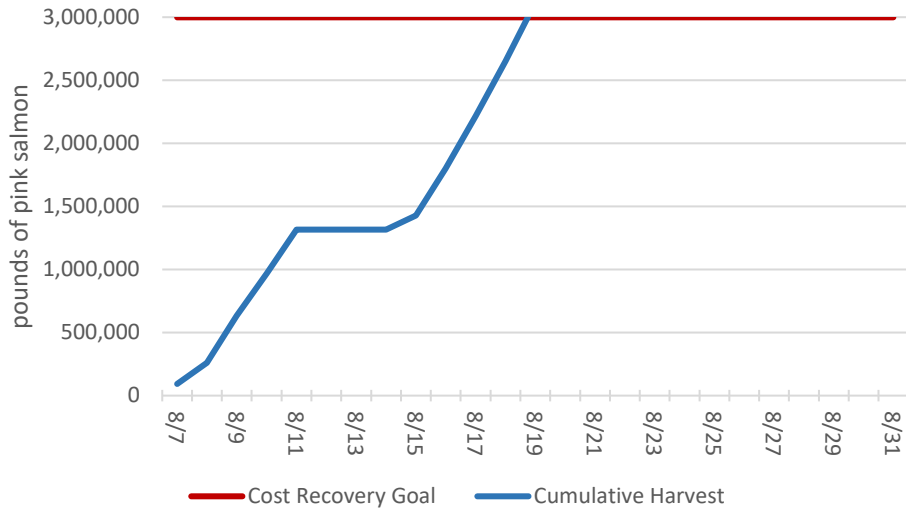
Spiridon Bay SHA

The 2022 Telrod Cove cost recovery goal was set at 300,000 pounds of sockeye salmon resulting from Spiridon Lake and Telrod Cove stocking projects. The Telrod Cove cost recovery harvest began on June 29, 2022 and concluded on July 26, 2022. A total of 300,499 lbs. of sockeye salmon, averaging approximately 4.5 lbs. were harvested during the cost recovery fishery.



Kitoi Bay SHA

The Kitoi Bay cost recovery goal for 2022 was set at 3.0 million pounds of Kitoi Bay Hatchery pink salmon. Cost recovery efforts began on August 7, 2022 and concluded on August 19, 2022 when a total of approximately 3,114,000 lbs. of pink salmon averaging 3.37 lbs. were harvested.



EDUCATION & OUTREACH



CONNECTING WITH OUR COMMUNITY

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 Kodiak ComFish Trade Show. Guests at the trade show had the opportunity to engage with different KRAA staff to discuss KRAA projects and learn more about the Association's mission and goals.

Hatchery Tours

The staff at Pillar Creek Hatchery typically provide 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 leads salmon campers in salmon dissections in most summers. Students are given an anatomy lesson that includes 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 provides an educational opportunity for local students. Following a presentation that includes salmon identification, life cycle, and anatomy, KRAA staff demonstrate to students how hatchery personnel collect eggs and milt from coho salmon. Each participating class is 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 leads fourth grade students in salmon dissections later in the year. It is a great opportunity for the students to get a hands-on physiology and anatomy lesson and to get a little messy as well!



KRAA PERSONNEL

ADMINISTRATION

Tina Fairbanks

Executive Director

Tammy Hulsey

Administrative Office Manager

Megan Holland

Administrative Assistant

Trenten Dodson

Production and Operations

RESEARCH & MONITORING

Nate Weber

Manager

Marina Thomas

Biologist

Shannon Polhemus

Biologist

Kirstin Eaker

Lab Technician

PILLAR CREEK HATCHERY

Al Seale

Manager

James "Hawk" Turman

Assistant Manager

Nick Allen

Fish Culturist

KITOI BAY HATCHERY

Mike Wachter

Manager

Lauren Deal

Assistant Manager

John Vinci

Fish Culturist

Brenden Thompson

Fish Culturist

Niq Medina

Fish Culturist

Kayla Hansch

Fish Culturist

Mike Fairbanks

Maintenance Manager

Nate Vreeland

Assistant Maintenance Manager

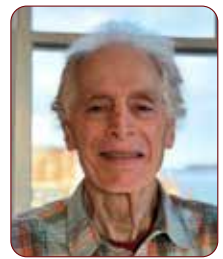
IN MEMORIAM



HARVEY GOODELL

Harvey Goodell joined the KRAA board of directors in 2001. During his tenure, he served as secretary from 2004-2014 and again in 2022. His even temperament and willingness to consider all sides of an issue were welcomed attributes he brought to the table at every board meeting. Though often quiet and reserved, he always beamed with pride with talking about his daughters and their many accomplishments. His more than twenty-year contribution to KRAA will be missed.

BOARD OF DIRECTORS



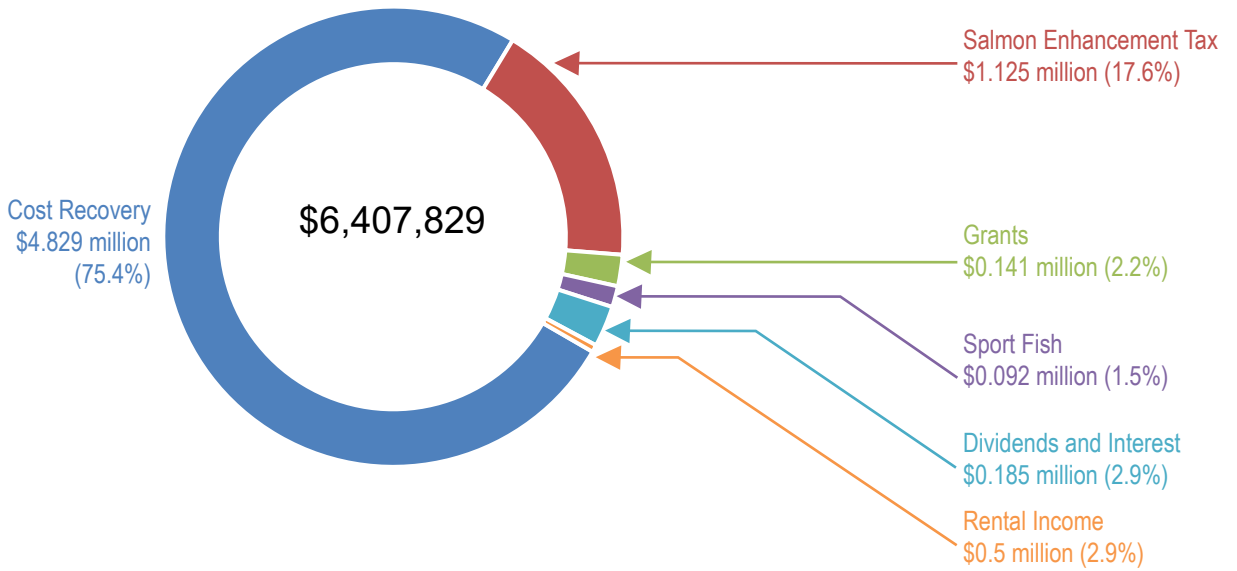
Top Row: Oliver Holm, Wallace Fields, Nate Rose, Garman Squartsoff, Bryan Horn

Second Row: Marko Patitucci, Matt Moir, Rick Berns, Dave Hilty, Jeff Stephan

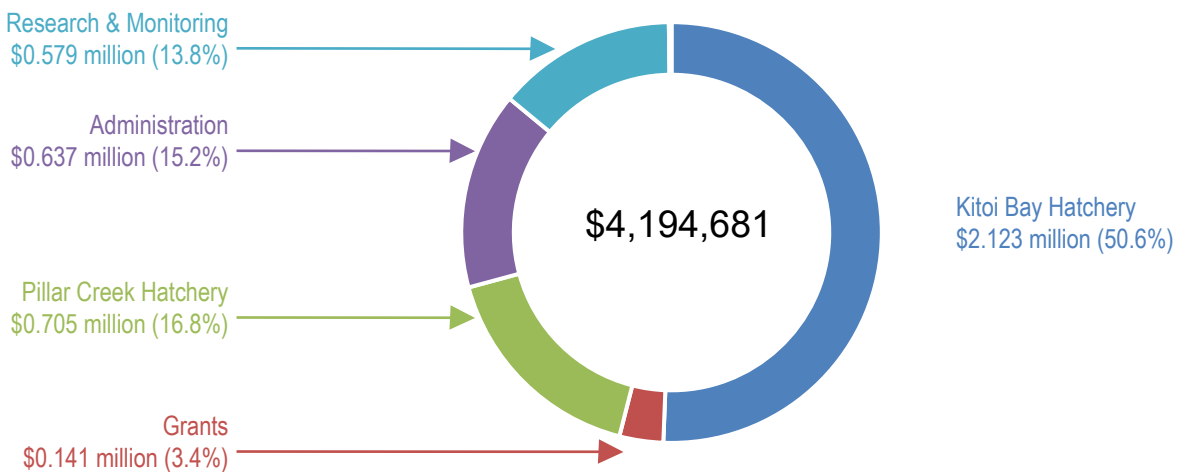
Third Row: Steven Horn, Adam Wischer, Adelia Myrick, Theresa Peterson, Nicholas Hoffman

KRAA FINANCIALS

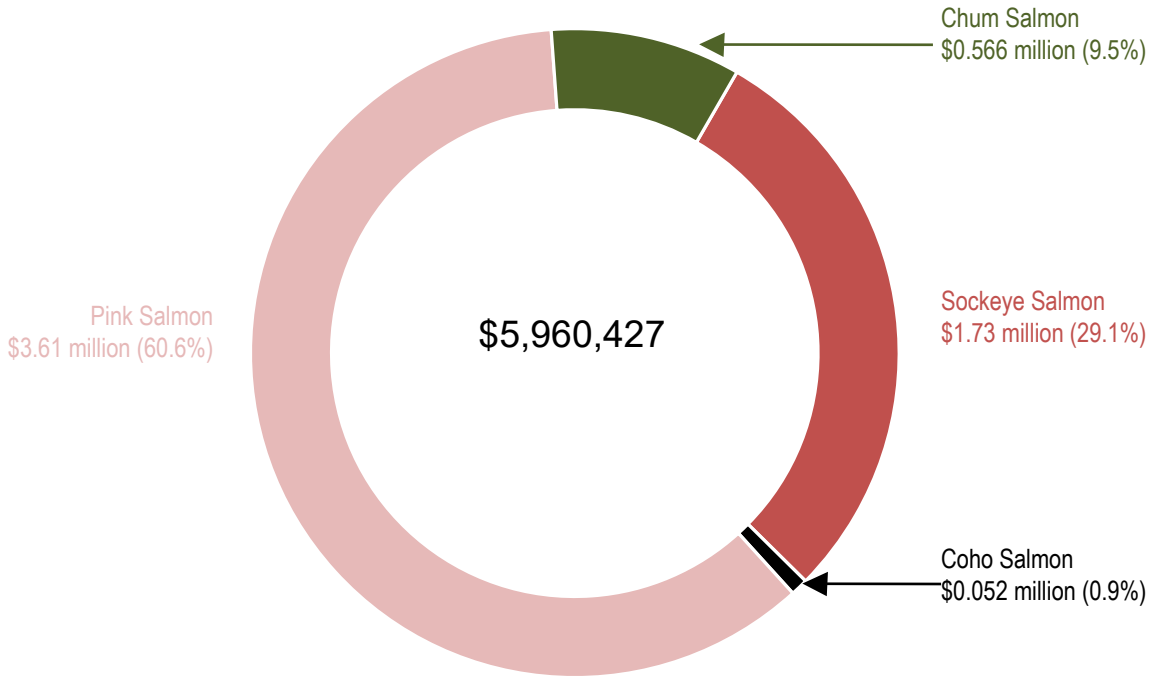
INCOME



EXPENSES



KRAA VALUE TO CCP



About 3.10 million hatchery-produced salmon were harvested in the Kodiak commercial common property (CCP) fishery in 2022, worth an estimated \$5.96 million (15% of total Kodiak CCP value). KRAA-produced pink salmon were valued at \$3.61 million, sockeye were valued at \$1.73 million, chum were valued at \$566,000, and coho were valued at \$51,500.



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