



OUR MISSION

The Kodiak Regional Aquaculture 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.



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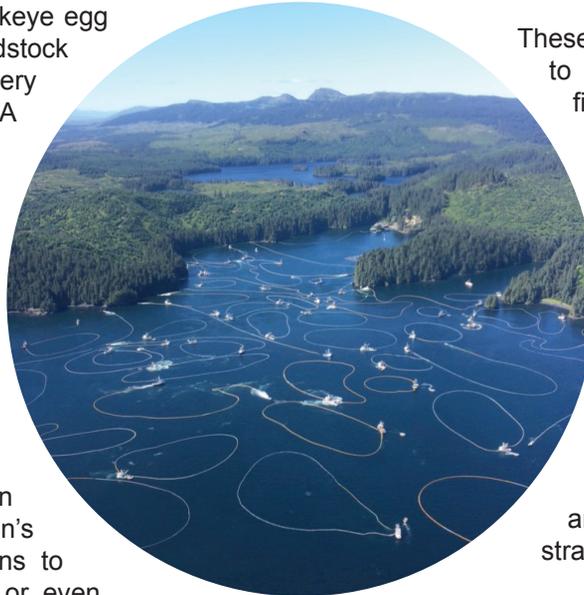
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Message from the Executive Director

Challenges. Every year we think we've seen everything that weather, fish culture, or fisheries issues can throw at us, and every year we are gifted with a surprise. In 2018, KRAA saw its fair share of challenges. Whether it was low sockeye escapement at Afognak Lake which prevented Pillar Creek Hatchery's early-run sockeye egg take, coming up short on Coho broodstock at Kitoi Bay, or challenges to hatchery production at the Board of Fish, KRAA continues to push forward to make a contribution to Kodiak's salmon fisheries in a sustainable manner.

Notably, it wasn't all challenges. KRAA had numerous successes in 2018 as well. In anticipation of low pink returns, KRAA was able to assess our financial resources and forgo cost recovery activities for pink salmon at Kitoi Bay. Additionally, a stronger than forecast hatchery return put over 3.2 million pinks into fishermen's nets around Kitoi Bay. Contributions to the fishery weren't limited to pinks or even to commercial fisheries. The sockeye return to Ouzinkie was stronger than expected and put several thousand fish on tables in that community and added to subsistence harvests for other communities as well.



Many sport fishing anglers in salt and freshwater were also delighted by the coho return to Monashka Bay and Pillar Creek. Releases from the hatchery in recent years have certainly made an impact on the opportunities for fishing on the Road System!

These and our other projects help contribute to maintaining vibrant, sustainable fisheries for all of Kodiak. Meeting challenges and finding ways to claim success is a common theme for any effort that relies on nature, climate, a natural resource, or any combination of those elements.

This year, our challenges came on other fronts as well. Many of you are likely aware that KRAA and other hatchery operators have been participating in a long-term study designed to look at hatchery straying and the reproductive fitness of hatchery strays when they spawn in natural streams.

This year concerns were voiced to the Board of Fisheries by members of the public related to the numbers of hatchery strays from Cook Inlet and Prince William Sound hatchery pink salmon which were observed

in Lower Cook Inlet streams in 2017. Challenges were made to the foundation and basis for the hatchery programs on a statewide level. There was even an emergency meeting held by the Board of Fisheries in July to consider two emergency petitions to reduce permitted hatchery production. Those petitions failed thanks to major efforts and support from fishermen, members of the public (from Kodiak and especially our villages), ADF&G, the processing sector, and, thankfully, real science that could dispel and counter much of the misinformation and propaganda that had been spread by hatchery opponents.

Much of the discussion and concern surrounding hatcheries continued through the winter and culminated in a public meeting centered around the ongoing Hatchery-Wild Interaction Study (HWI), which is a part of the Alaska Hatchery Research Project (AHRP), and a Hatchery Committee meeting of the full Board of Fisheries the day prior to their spring statewide meeting. Members of the Alaska Department of Fish & Game gave detailed presentations on the HWI and AHRP. While the AHRP is an ongoing project, and there are many avenues of investigation still open to inquiry on straying and other topics,

KRAA feels strongly that the programs we have here in Kodiak are both defensible and sustainable. We are committed to continuing with the research projects in which we're involved on both a local and statewide level, and we're committed to pursuing new projects where science indicates they can be supportable.



In the meantime, we are also committed to sustaining our current projects and contributions to the fisheries. We will continue to work to get out the message about our programs, and as ever, invite you to visit our offices and our facilities and to approach us with questions if you have them. We consider ourselves available to all members of the public and would like to thank the many salmon permit holders, sport and subsistence users, community members, and local organizations that continue to support KRAA and the work we do in our community.

Good luck to all of you in the coming season!

Tina Fairbanks

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.

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 over 30 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 funded primarily 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.

REGIONAL PLANNING TEAM

The Kodiak Regional Planning Team (KRPT) is comprised of six voting members: three positions are held by representatives of KRAA, and representatives of ADF&G hold three seats. The team currently has a non-voting chairman and several non-voting ex-officio members. The KRPT is tasked with preparing a regional comprehensive salmon plan (updated in 2010) to rehabilitate natural stocks and supplement natural production with provisions for both public and private nonprofit hatcheries.

2018 KRPT MEMBERS

Tyler Polum - KRPT Chair (ADF&G)
Oliver Holm (KRAA)
Wallace Fields (KRAA)
Melissa Berns (KRAA)
Sam Rabung (ADF&G - FMPD)
Kevin Schaberg (ADF&G -CF)
Dan Bosch (ADF&G - SF)



2018 Releases

The production priorities at each of KRAA's hatchery facilities differ primarily based on location and design. Kitoi Bay Hatchery (KBH) remotely located on Afognak Island, focuses primarily on pink and chum salmon fisheries enhancement, but also provides enhanced common property salmon fishing opportunities by increasing coho and sockeye salmon to the Kitoi Bay area. A smaller portion of coho and sockeye production are out-stocked and provide harvest opportunity for other user groups like subsistence and sport fishermen.

While release goals for KBH are static and based on production/return goals, most release goals at Pillar Creek Hatchery (PCH) fluctuate based on ADF&G stocking recommendations.

PCH is designed to produce juvenile sockeye salmon for stocking barren-lake systems to enhance adult salmon production and for stocking anadromous lakes to rehabilitate weak sockeye salmon stocks. These stocking projects were

developed to increase sockeye salmon harvest opportunities for common property fisheries, available to all Kodiak commercial, subsistence, personal use, and sport fishermen. PCH functions primarily 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 to release sites remote from PCH.

On a smaller scale, KRAA continues to work cooperatively with the ADF&G Division of Sport Fish to produce coho salmon, king salmon, and rainbow trout to enhance fishing opportunities on the Kodiak road system. These fish are reared at PCH and then released by ADF&G in the spring/summer.



Release numbers, locations, and sizes are shown on page 7 and listed by species.

PINK

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Big Kitoi Bay	KBH	1.09	191,952,100	5H*

*10% of pinks released were otolith marked
Numbers rounded to nearest 100

CHUM

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Big Kitoi Bay	KBH	1.39	9,712,500	3,4,2H
Big Kitoi Bay	KBH	2.46	13,222,900	3n,2H

Numbers rounded to nearest 100

CHINOOK

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Salonie Creek	PCH	15.0	46,000	none
Olds River	PCH	16.0	45,000	none
American River	PCH	15.0	36,600	none

Numbers rounded to nearest 100



SOCKEYE

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Hidden Lake	PCH	0.29-0.73	204,300	none
Crescent Lake	PCH	0.34	101,500	none
L. Waterfall Lake	PCH	0.73	75,000	none
B. Waterfall Lake	PCH	0.73	50,200	none
Spiridon Lake	PCH	0.40	3,252,800	3,3,3H
L. Jennifer Lake	PCH	0.40	49,900	3,3,3H
U. Jennifer Lake	PCH	0.40	102,200	3,3,3H
Ruth Lake	PCH	0.40	74,500	3,3,3H
Telrod Cove	PCH	13.0	230,500	4,3,2H
Little Kitoi Lake	KBH	6.2	76,600	5,4H
Ouzinkie	KBH	23.1	55,300	none
Little Kitoi Bay	KBH	21.0	399,600	none

Numbers rounded to nearest 100

COHO

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Pillar Creek	PCH	8.7	43,300	3,2H
Monashka Creek	PCH	8.5	46,100	3,2H
Big Kitoi Bay	KBH	19.3	373,100	none
Ruth Lake	KBH	1.5	30,000	none
L. Jennifer Lake	KBH	1.5	50,000	none
U. Jennifer Lake	KBH	1.5	90,000	none
Katmai Lake	KBH	5.8	30,000	none
Crescent Lake	KBH	0.40	165,000	none

Numbers rounded to nearest 100

TROUT

LOCATION	FACILITY	SIZE (g)	NUMBER	MARK
Various Lakes*	PCH	1.09	55,000	none

*Rainbow trout were released at 16 lakes within the Kodiak Road System
Numbers rounded to nearest 100

2018 KRAA Contribution and Distribution

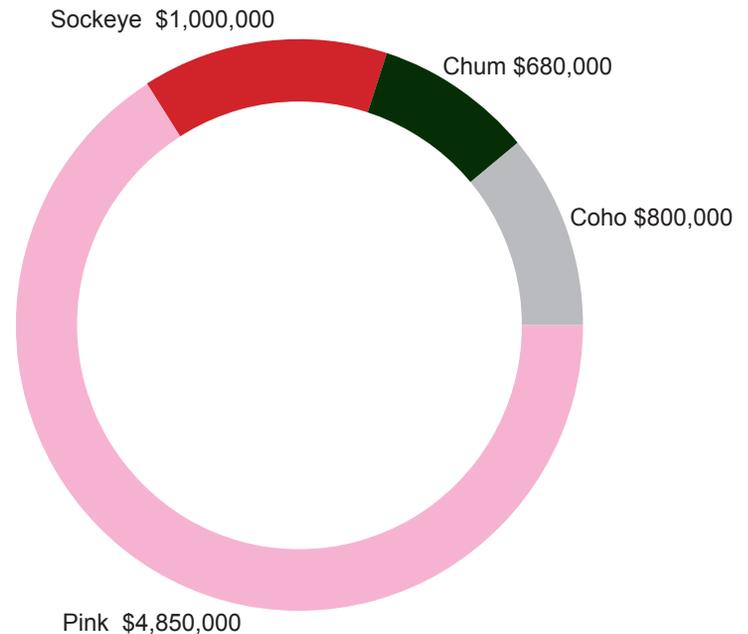
In 2018, approximately 4.1 million adult salmon were attributed to KRAA hatcheries. Just over 3.6 million of the KRAA-produced salmon were harvested in the common property commercial fishery and contributed a value of approximately \$7.33 million (25% of the total Kodiak commercial harvest value). KRAA pink salmon contributed nearly 73% of the total value of hatchery returns followed by sockeye, coho, and chum salmon (see graph).

KITOI BAY HATCHERY (KBH)

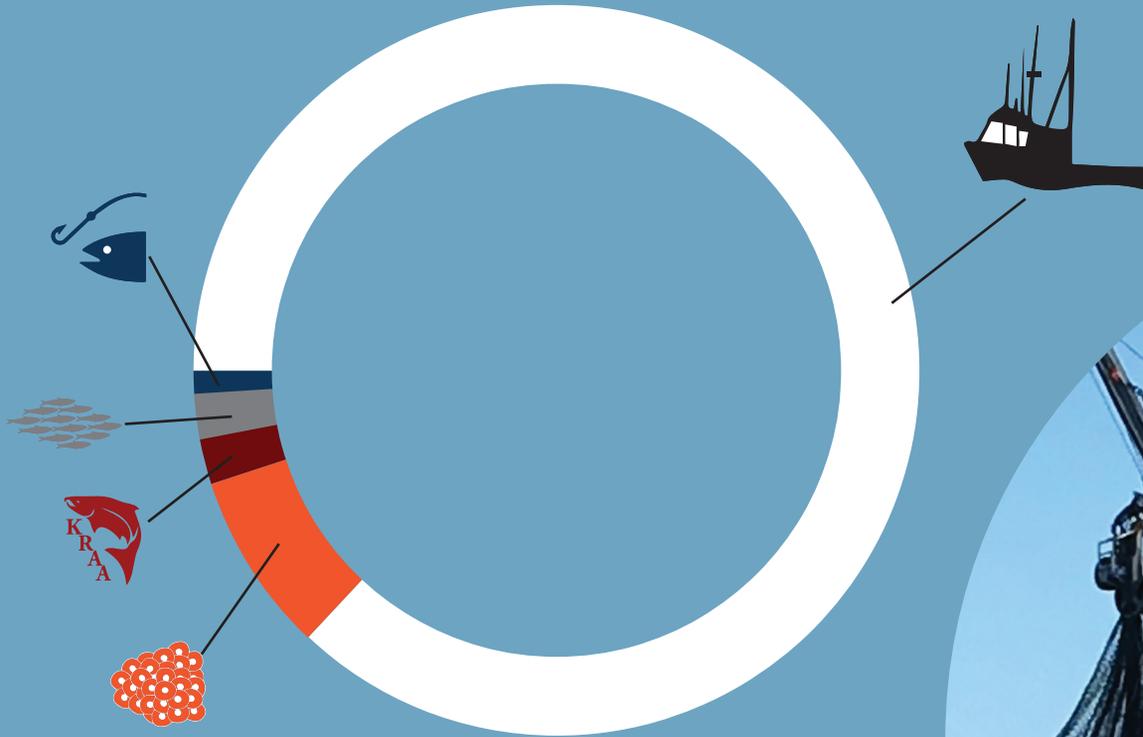
In 2018, just over 207,000 chum salmon returned to KBH. Pinks salmon exceeded the 2018 forecast with a return of 3.517 million. Around 25,800 sockeye salmon returned to Kitoi Bay from direct releases at Little Kitoi Lake. Over 147,000 coho salmon returned to Kitoi Bay and provided commercial fishing opportunity for area seiners.

PILLAR CREEK HATCHERY

In 2018, approximately 151,600 sockeye salmon were attributed to the Spiridon Lake/Telrod Cove project. Estimates for sockeye salmon returning to Foul Bay were 6,300. Coho salmon harvested in the sport fishery returning to Kodiak road system releases were estimated to be approximately 9,400. Just over 1,100 Chinook salmon returned to Salonie Creek and the American and Olds rivers.



DISTRIBUTION OF THE TOTAL KRAA CONTRIBUTION ALL SPECIES (4.1 million fish)



Eighty-nine percent of KRAA-produced salmon were harvested in the common property commercial fishery. KRAA fish used for broodstock represented 8 percent, while both cost recovery and excess/escapement represented 1 percent each. Sport caught and subsistence combine to represent less than 1 percent.





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.

The bulk of adult returns to Kitoi Bay are intercepted in many of the districts of the KMA and largely in Duck, Izhut and Kitoi bays. However, the hatchery collects its broodstock from those fish that make their way through the common property fisheries and return directly to the hatchery. Egg collection, or egg takes, are collected at Kitoi Bay under fairly controlled circumstances. Eggs collected at KBH are placed directly into the incubation facility. By contrast, Pillar Creek Hatchery releases its production to remote locations like Spiridon, Hidden, and Crescent lakes and therefore, crews from PCH must travel to locations such as Afognak and Saltery lakes in order to collect broodstock.

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 2018

sockeye egg-take goals were based on the recommended 2019 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 2018, sockeye salmon at Afognak Lake did not meet the minimum escapement goal, therefore eggs for Pillar Creek Hatchery's early-run sockeye salmon project were not collected. Likewise, due to minimum escapement at Little Kitoi Lake, sockeye salmon eggs for Kitoi Bay Hatchery were collected at Saltery Lake.

2018 Egg Collections

LOCATION	FACILITY	SPECIES	GREEN
Kitoi Bay	KBH	Chum	36,070,000
Monashka	PCH	King	92,000
Kitoi Bay	KBH	Pink	184,864,000
Saltery Lake	PCH/KBH	Sockeye	4,704,000
Pillar Creek	PCH	Coho	244,000
Kitoi Bay	KBH	Coho	1,575,000

Numbers rounded to nearest 1,000

Monitoring Programs

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. Projects for 2018 included:

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, 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.

WATERFALL LAKES/PERENOSA BAY

Due to diminished zooplankton abundance, sockeye salmon fry releases were suspended at Big and Little Waterfall lakes from 2011 to 2014. Therefore, few enhanced fish were expected to return to Perenosa Bay in 2018. The barrier net was not installed and minimal commercial salmon harvest occurred.

HIDDEN LAKE/FOUL BAY

Sockeye salmon returning to Foul Bay are harvested in the Foul Bay Special Harvest Area. 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.

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 2018, 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.



WATER TEMPERATURE MONITORING

In 2018, KRAA, US Fish and Wildlife Service, ADF&G, STK, Old Harbor, and Larsen Bay continued the archipelago-wide volunteer water temperature monitoring program. Network cooperators record temperature data on a year-round basis at 27 stream sites and 25 lakes sites.

OTOLITH EVALUATIONS

In 2018, KRAA collected 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 various chum salmon release strategies employed by Kitoi Bay Hatchery staff. All otoliths are analyzed by KRAA personnel at the KRAA lab on Near Island.



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. 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 2018, the Association concentrated cost recovery efforts at the Spiridon Bay and Kitoi Bay Special Harvest Areas.

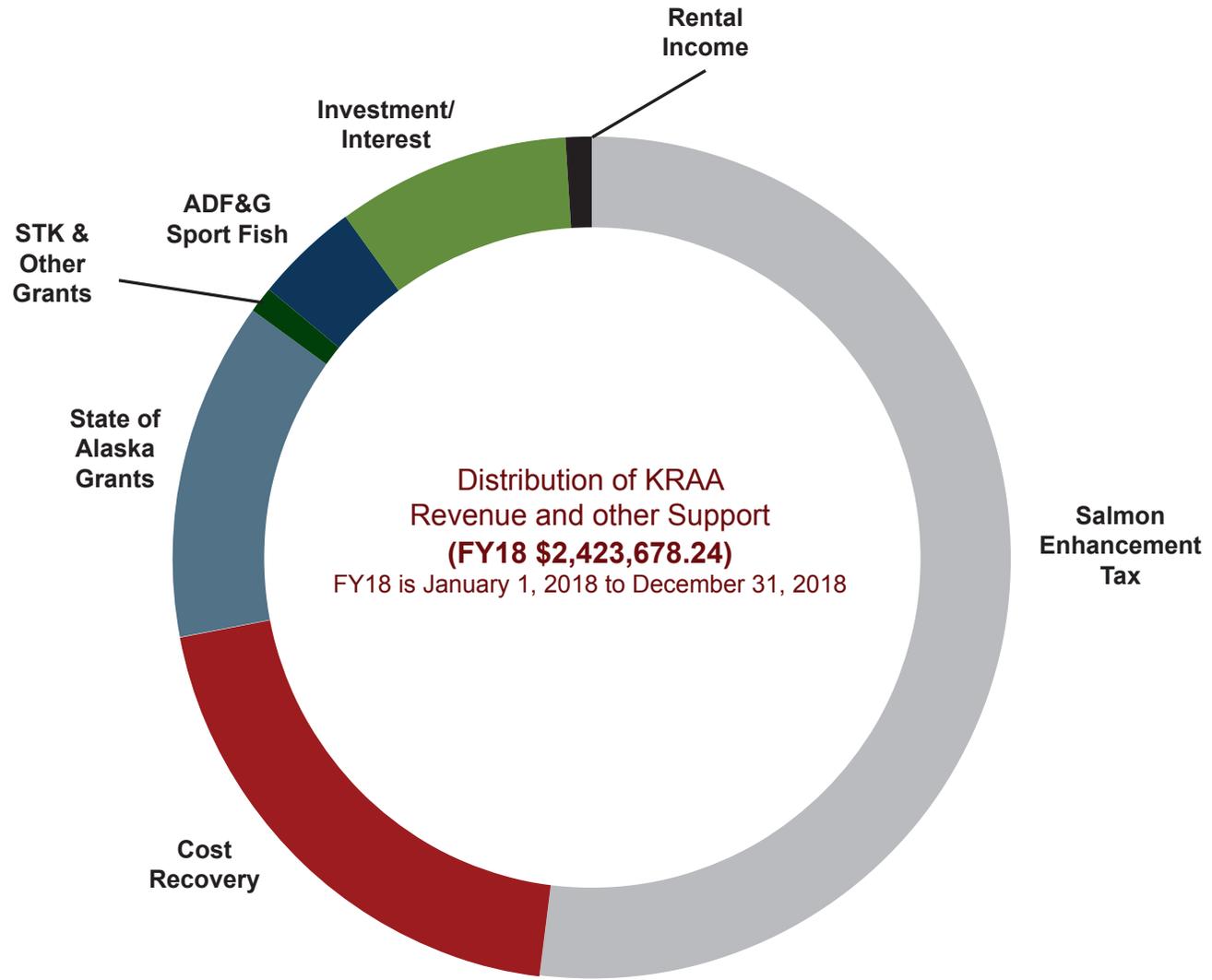
SPIRIDON BAY SHA

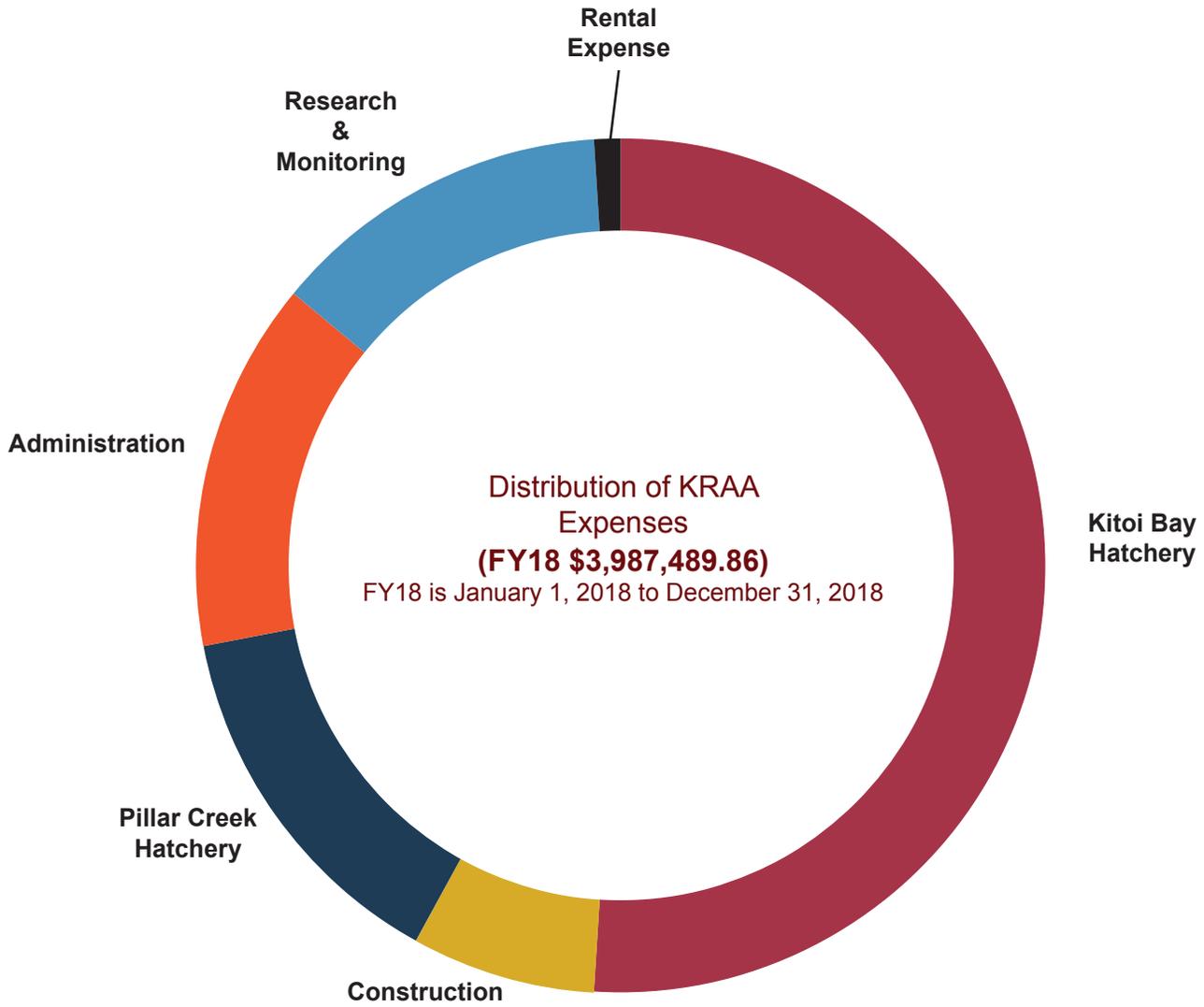
KRAA initiated a cost recovery program in 2010 to provide a regular funding stream for Pillar Creek Hatchery operations. The 2018 Telrod Cove cost recovery goal was set at 300,000 pounds of sockeye salmon returning from Spiridon Lake and Telrod Cove stocking projects. Just over 80% of the goal was achieved in 2018.

In 2018, the Telrod Cove cost recovery harvest began on July 5, 2018 and concluded on July 31, 2018. A total of 240,000 lbs. of sockeye salmon, averaging approximately 4.65 lbs. were harvested during the cost recovery fishery. In addition to the 51,790 sockeye salmon harvested in the cost recovery, 8,801 were harvested within the SHA during the common property fishery. The total return of Telrod Cove bound sockeye salmon was calculated at approximately 151,601 adult fish and contributed more than 90,000 sockeye salmon to fisheries in districts outside the Special Harvest Area.

KITOI BAY SHA

Cost recovery efforts were suspended at Kitoi Bay Hatchery for 2018.





Education & Outreach

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 2018 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 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 great opportunity for the students to get a hands-on physiology and anatomy lesson and to get a little messy as well!

PUBLICATIONS AND DIGITAL MEDIA

Over the last several years KRAA has developed its Annual Report to provide a summary of the year's events as well as a snap shot of the Association's annual financial position. In addition, KRAA has established a presence on social media to widen its reach demographically and to provide the public with up-to-date information on KRAA activities. The KRAA website, www.kraa.org, features a user-friendly interface with an new virtual library with archived annual and hatchery reports along with annual management plans for both Kitoi Bay and Pillar Creek hatcheries.



Board of Directors



Top Row: Oliver Holm, Wallace Fields, Nate Rose, Bryan Horn, Steven Horn
Second Row: Kip Thomet, Rick Berns, Dave Hilty, Chad Aga
Third Row: Melissa Berns, Jeff Stephan, Harvey Goodell, Matt Moir, Rick Ellingson
Not Pictured: Chris Berns



Administration

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Executive Director

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Administrative Office Manager

Megan Holland
Administrative Assistant

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Production and Operations

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Al Seale
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James "Hawk" Turman
Assistant Manager

Lauren Bailey
Fish Culturist

Kitoy Bay Hatchery

Mike Wachter
Manager

Chet Thomas
Assistant Manager

Nick Allen
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Adam Ruyle
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Rob Sangster
Fish Culturist

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