

Kodiak Regional Aquaculture Association
2017 Annual Report



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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Letter from the Executive Director

Last year in this space I described some of the challenges recent years had provided KRAA's biologists, fish culturists and managers. I indicated that those challenges require adaptation. This year was not without its own uniquely challenging circumstances, but on behalf of KRAA staff, I feel I can say, "challenge accepted." In 2017 KRAA's managers responded to the 2016 pink salmon disaster by working to trim budgets and tighten spending wherever possible. At the same time, our Research & Monitoring arm was able to increase their capacity for scale and otolith reading and analysis, Pillar Creek Hatchery planned and implemented multiple egg take contingencies around ongoing construction and managed to safely house all of the eggs from their egg takes, and Kitoi Bay Hatchery achieved full production for all four species cultured at the facility for the first time in 4 years.

Challenges still exist, but we see triumphs for our programs from time to time as well. In 2017 we had lower than expected returns at Kitoi Bay for sockeye, pinks and coho, but the chum beat our expectation by more than double and provided some inner bay openers for the first time in several years. Early indications are that in 2017 chums showed a strong 2-ocean component, and we are hoping for a stronger than average return of 3-Ocean chums in 2018 as well. Last year was also the first year of return from a "new" rearing strategy for chums at the hatchery, and so these early indications also show we may have some success in response to that change. Sockeye returns to the Westside and Telrod Cove resulting from Pillar Creek Hatchery's Spiridon Lake Stocking

and saltwater net pen imprinting project returned over 50,000 more fish than our mid-point forecast (343,000 total); and Pillar Creek's early-run sockeye return to Foul Bay also exceeded our preliminary estimates—by more than 6,000 fish. In addition, we have heard encouraging reports of abundant subsistence harvest of sockeye in the community of Ouzinkie where we imprint and release sockeye salmon smolt each spring, and we observed substantial subsistence harvest in Telrod Cove as well. Finally, the crew at Pillar Creek Hatchery has been releasing coho directly to Pillar Creek in recent years, and this year saw more than 6,000 fish returning directly to the creek and a total of 14,800 enhanced coho returned to the Road System overall. These ways in which we succeed in our mission—to provide fish for all user groups in the Kodiak region—make each year's challenges worthwhile.

What we work toward here at KRAA is making a contribution that matters to the commercial fishermen & women who support us and to our community as a whole. Our managers and staff never lose sight of the fact that the monies spent on KRAA projects come directly from Kodiak salmon permit holders, and we are proud to work for them and for salmon users of all types.

Happy fishing,



Tina Fairbanks,
Executive Director



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 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.





2017 KRPT MEMBERS

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

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.



2017 Releases

LOCATION	SPECIES	STOCK	STAGE	NUMBER
Hidden Lake	Sockeye	Afognak Lake	Fed Fry	214,900
Crescent Lake	Sockeye	Afognak Lake	Fed Fry	132,200
Spiridon Lake	Sockeye	Saltery Lake	Fed Fry	2,118,200
L. Jennifer Lake	Sockeye	Saltery Lake	Fed Fry	40,000
U. Jennifer Lake	Sockeye	Saltery Lake	Fed Fry	52,000
Ruth Lake	Sockeye	Saltery Lake	Fed Fry	65,100
Telrod Cove	Sockeye	Saltery Lake	Smolt	255,600
Salonie Creek	Chinook	Monashka Ck	Smolt	20,500
American River	Chinook	Monashka Ck	Smolt	26,500
Olds River	Chinook	Monashka Ck	Smolt	26,500
Pillar Creek	Coho	Buskin Lake	Smolt	77,700
Monashka Creek	Coho	Buskin Lake	Smolt	75,000
Island Lake	Coho	Buskin Lake	Smolt	50,100
Mission Beach	Coho	Buskin Lake	Smolt	20,100
Kodiak Road System Lakes	Rainbow Trout	Swanson River/WJHSFH	Fingerling	102,000

Numbers rounded to nearest 100



2017 Egg Collections

LOCATION	SPECIES	GREEN	EYED
Afognak Lake	Sockeye	824,000	712,000
Saltery Lake	Sockeye	4,532,000	4,183,268
Monashka	Chinook	72,000	68,000
Pillar Creek	Coho	263,000	169,000

Numbers rounded to nearest 1,000



Pillar Creek Hatchery

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 originally 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 in the Kodiak Management Area (KMA) for common property fisheries - available to all Kodiak commercial, subsistence, personal use, and recreational fishermen.

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.

In 2017 PCH produced juvenile sockeye salmon for lake stocking projects, reared sockeye smolt in saltwater net pens at Telrod Cove, and continued to work cooperatively with ADF&G Division of Sport Fish to produce coho salmon, king salmon, and rainbow trout to enhance fishing opportunities on the Kodiak road system.

In 2017, the Pillar Creek Hatchery incubation building was rebuilt from the foundation up. Some of the improvements to the new facility include:

- 4 foot concrete stem walls
- second story storage
- new boiler system for otolith marking
- 100% disinfectable walls and ceiling
- improved ventilation system



Kitoy Bay Hatchery

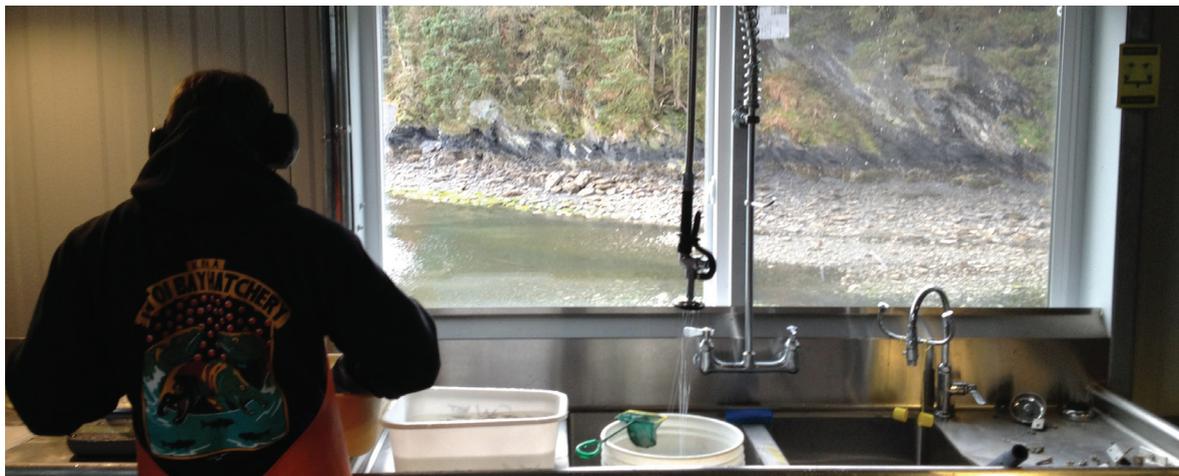
Kitoy Bay Hatchery (KBH) is located on Afognak Island on the west side of Izhut Bay approximately 48 km (30 miles) north of the City of Kodiak. The hatchery infrastructure was constructed in 1954 by the U. S. Department of the Interior, Fish and Wildlife Service, but was destroyed in the 1964 earthquake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

2017 release numbers were practically light for chum and pink salmon due to poor returns and difficult egg takes in 2016. Likewise, with the exception of chum salmon, the returns in 2017 were well below projection.

Although 2017 was a bit disappointing for releases and overall returns, the year was capped off with a great egg take season. All of KBH egg-take goals were met for the first time in several years.





2017 Egg Collections

LOCATION	SPECIES	STOCK	GREEN	EYED
KBH	Chum	Big Kitoi Ck	34,913,000	31,494,000
KBH	Pink	Big Kitoi Ck	217,812,000	195,902,000
Saltery Lake*	Sockeye	Saltery Lk	922,580	850,280
KBH	Coho	Big Kitoi Ck	1,275,000	1,267,000

*Saltery Lake is a back up egg take location for Little Kitoi Lake

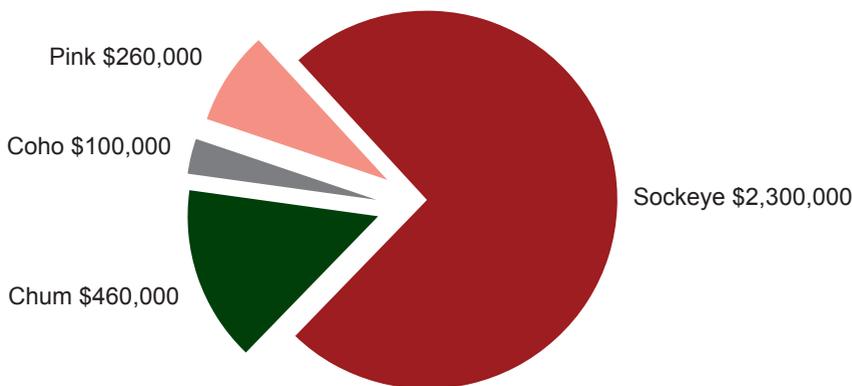
2017 Releases

LOCATION	SPECIES	STOCK	STAGE	NUMBER
Big Kitoi Bay	Chum	Big Kitoi Creek	Fed Fry	14,192,900
Big Kitoi Bay	Pink	Big Kitoi Creek	Fed Fry	66,579,000
Little Kitoi Lake	Sockeye	Saltery Lake	Smolt	585,800
Ouzinkie	Sockeye	Saltery Lake	Smolt	49,400
Crescent Lake	Coho	Buskin Lake	Fed Fry	19,600
Big Kitoi Bay	Coho	Big Kitoi Creek	Smolt	1,026,400

Numbers rounded to nearest 1,000

2017 KRAA Contribution

In 2017, approximately 3.2 million adult salmon were attributed to KRAA hatcheries. Just over 710,000 of the KRAA-produced salmon were harvested in the common property commercial fishery and contributed a value of approximately \$3.12 million (6% of the total Kodiak commercial harvest value). KRAA sockeye salmon contributed nearly 73% of the total value of hatchery returns followed by chum, pink, and coho salmon (see graph below).



KITOI BAY HATCHERY (KBH)

In 2017, just over 221,000 chum salmon returned to KBH. Far fewer than expected pink salmon (approximately 2.6 million) returned to KBH (10 million projected). Around 13,300 sockeye salmon returned to Kitoi Bay from direct releases at Little Kitoi Lake. Over 31,000 coho salmon returned to Kitoi Bay and provided commercial fishing opportunity for area seiners.

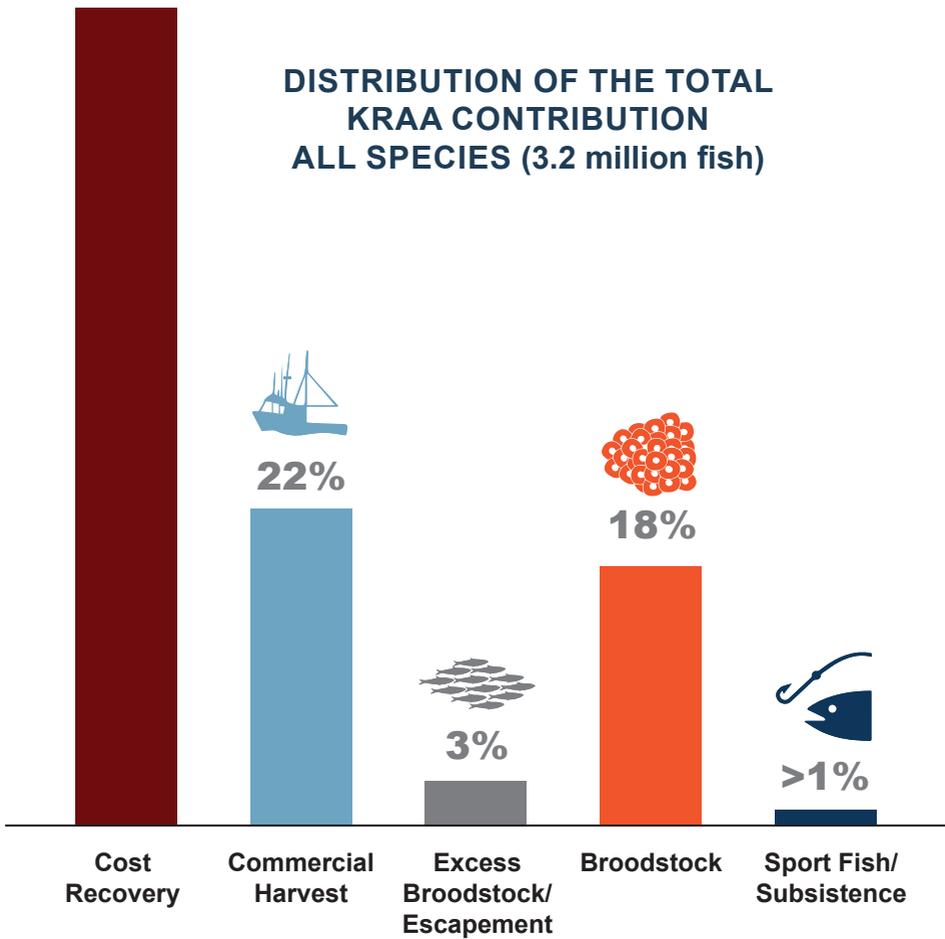
PILLAR CREEK HATCHERY

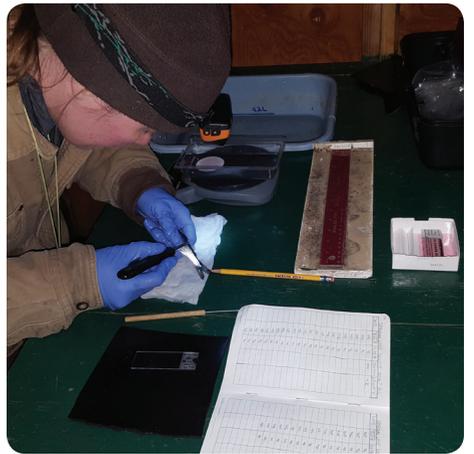
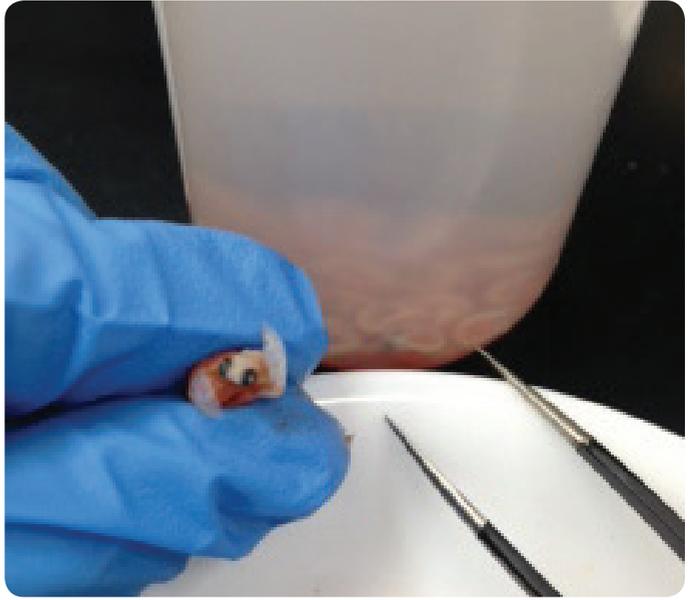
In 2017, approximately 342,888 sockeye salmon were attributed to the Spiridon Lake/Telrod Cove project. Estimates for sockeye salmon returning to Foul Bay were just over 21,300. Coho salmon harvested in the sport fishery returning to Kodiak road system releases were estimated to be approximately 14,800. Just over 1,500 Chinook salmon returned to Monashka Creek and the American and Olds rivers.



57%

**DISTRIBUTION OF THE TOTAL
KRAA CONTRIBUTION
ALL SPECIES (3.2 million fish)**





Research & 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. Projects for 2017 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. In 2017, approximately 471,000 sockeye salmon smolt emigrating from Spiridon Lake were enumerated through the bypass system.

In 2017, nearly 70,000 sockeye salmon (see Cost Recovery on page 18) were harvested in the Spiridon Bay Special Harvest Area (SBSHA), located at Telrod Cove. The harvest was monitored by KRAA staff from mid-June to early August. Monitoring duties included estimating the build-up of returning sockeye salmon, estimating and sampling the sockeye salmon harvest, and estimating the incidental harvest. KRAA also collected 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.

KRAA has released over 76 million juvenile sockeye salmon into Spiridon Lake since 1991. Additionally, nearly over 3.1 million sockeye salmon smolt have been released in Telrod Cove beginning in 2013. Nearly 6.0 million adult sockeye salmon have returned from those releases, with nearly 5.6 million fish contributing to the common property commercial fishery. Since the cost recovery harvest began in 2010, KRAA has harvested just over 352,000 sockeye salmon.

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 2017. The barrier net was not installed and commercial salmon harvest did not occur. Sockeye salmon fry were released at Big and Little Waterfall lakes in 2015 and 2017 (no release in 2016); returns from the 2015 releases are expected in 2018. Since 1995, commercial fisherman have harvested over 335,000 sockeye salmon resulting from the Waterfall Lakes releases.

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. A total of 21,301 sockeye salmon were harvested in Foul Bay in 2017. Since 1995, commercial fisherman have harvested over 470,000 sockeye salmon resulting from the Hidden Lake releases.

SALTERY RIVER

KRAA provides funding and personnel to ADF&G to install and operate the weir on an annual basis. In 2017, more than 39,000 sockeye salmon were passed through the Saltery River weir. Once escapement goals were met, KRAA utilized 3,490 adult sockeye salmon for Pillar Creek and Kitoi Bay 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 2017, 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.

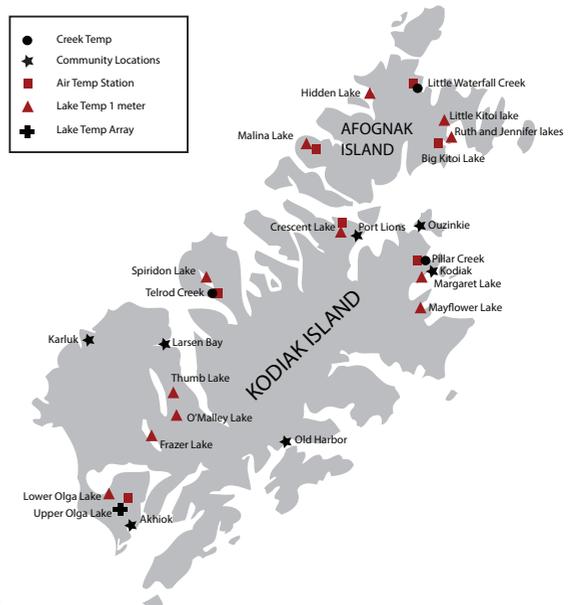
Limnology data collected on sockeye salmon nursery lakes that are not regularly stocked with salmon are archived to provide baseline information. The data is important in instances where sockeye returns begin to dwindle. The baseline limnology and zooplankton data can be used to attribute, or rule out,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

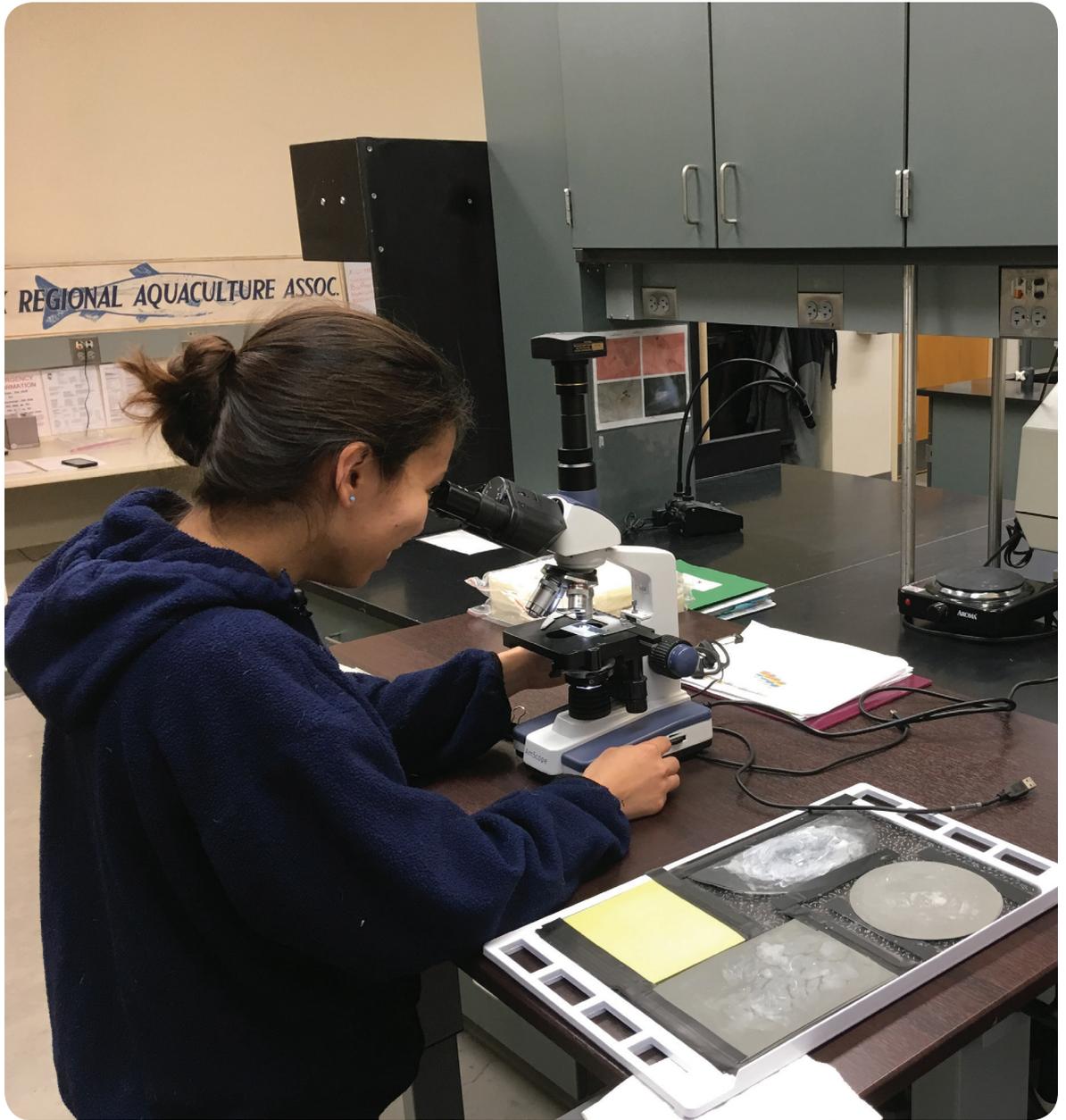
NET PEN REARING MONITORING

KRAA biologists also collect water quality data at sockeye and coho salmon net pen rearing sites. Biochemical oxygen demand and total suspended solids are a couple of the parameters analyzed and cataloged from samples collected at Margaret and Little Kitoi lakes. These analyses track any changes that might occur in the aquatic or marine environment that may be attributed to rearing activities.

WATER TEMPERATURE MONITORING

In 2017, 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. KRAA is responsible for monitoring the sites depicted in the map below.





OTOLITH MONITORING PROGRAM

In 2017, 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 the late-large program. 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 2017, 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 2017 Telrod Cove cost recovery goal was set at 400,000 pounds of sockeye salmon returning

from Spiridon Lake and Telrod Cove stocking projects. The goal was not achieved in 2017.

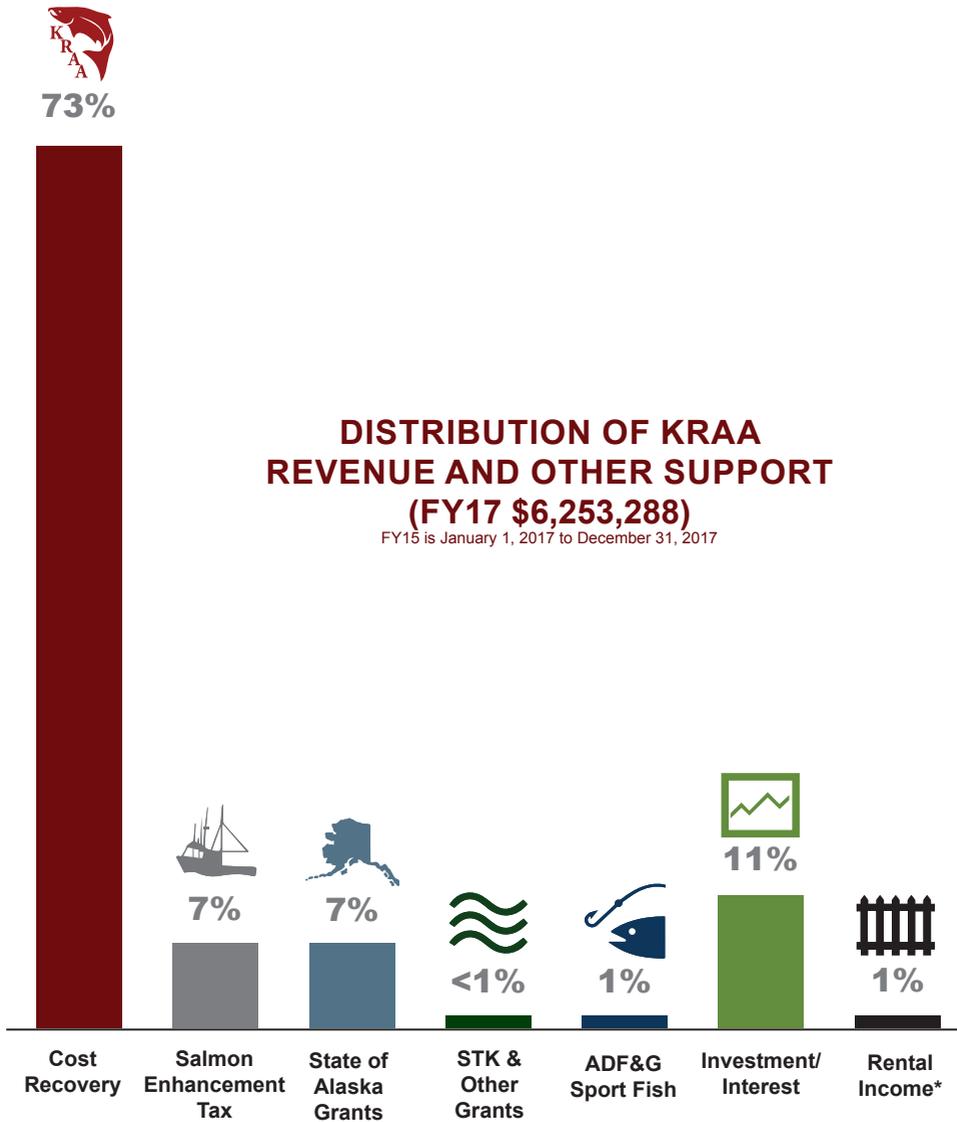
In 2017, the Telrod Cove cost recovery harvest began on June 29, 2017 and concluded on July 31, 2017. A total of 272,000 lbs. of sockeye salmon, averaging approximately 5.1 lbs. were harvested during the cost recovery fishery. In addition the 53,631 sockeye salmon harvested in the cost recovery, 16,364 were harvested within the SHA during the common property fishery. The total return of Telrod Cove bound sockeye salmon was calculated at approximately 342,888 adult fish and contributed more than 272,000 fish to fisheries in districts outside the Special Harvest Area.

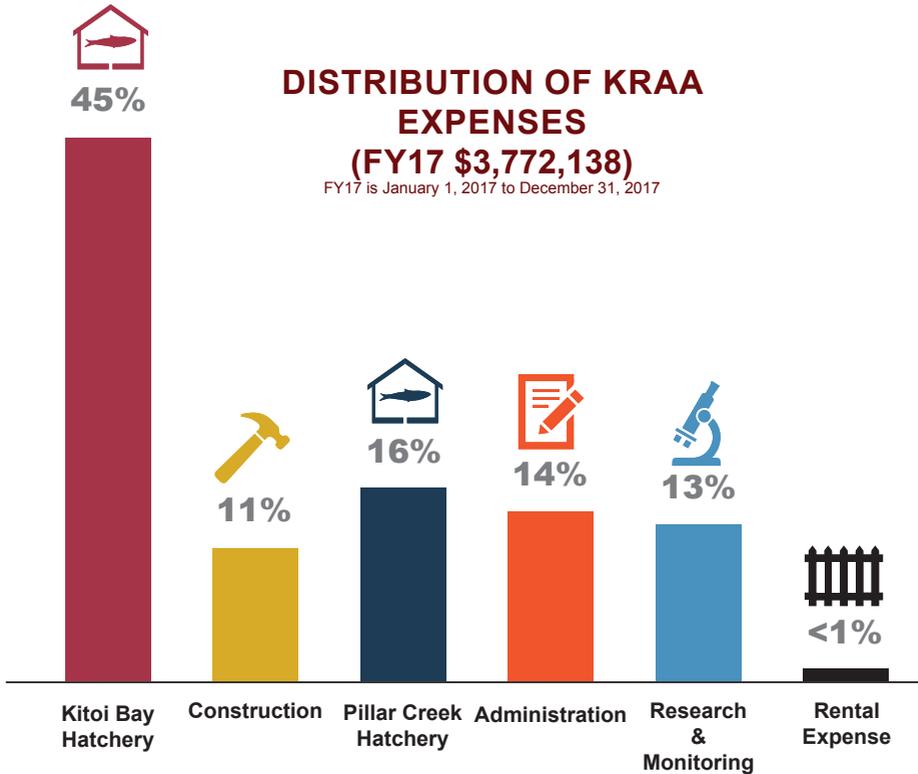
KITOI BAY SHA

The Kitoi Bay cost recovery goal for 2017 was set at 6.0 million pounds of Kitoi Bay Hatchery pink salmon. Efforts began on August 2, 2017, however, due to the weak return, cost recovery was suspended to allow for broodstock collection. Once sufficient brood was captured and holding behind the brood seine, cost recovery re-started. The cost recovery harvest concluded on September 6, 2017 when a total of approximately 793,000 pink salmon had been harvested. The goal of 6.0 million pounds was nearly reached, Unfortunately, due to the poor return, only 200,000 pink salmon were harvested in the common property fisheries surrounding Kitoi Bay.



Financial Information





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 2017 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.

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 snapshot 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, was redesigned in 2016, and has many new features to provide a user-friendly interface. A newsletter and virtual library on the website are upcoming projects KRAA will be adding to the outreach program.

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.



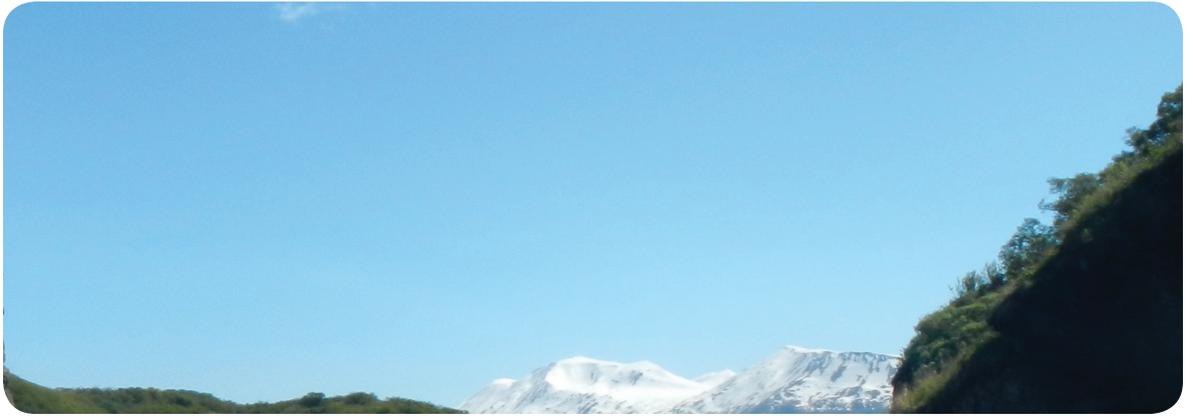
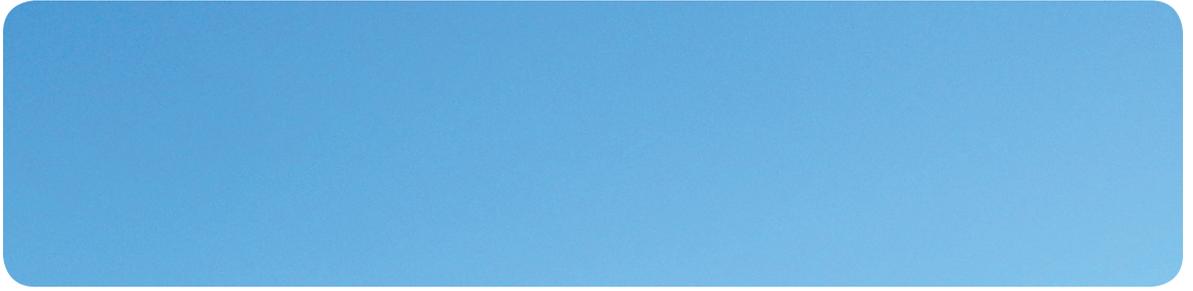
SALMON CAMP

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.

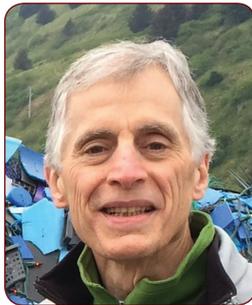


SALMON IN THE CLASSROOM

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!



Board of Directors



Top Row: Oliver Holm, Wallace Fields, Nate Rose, Raymond May,
Second Row: Alf Pryor, Kip Thomet, Rick Berns, Dave Hilty
Third Row: Melissa Berns, Jeff Stephan, Harvey Goodell, Matt Moir
Bottom Row: Chad Aga, Rick Ellingson, Steven Horn



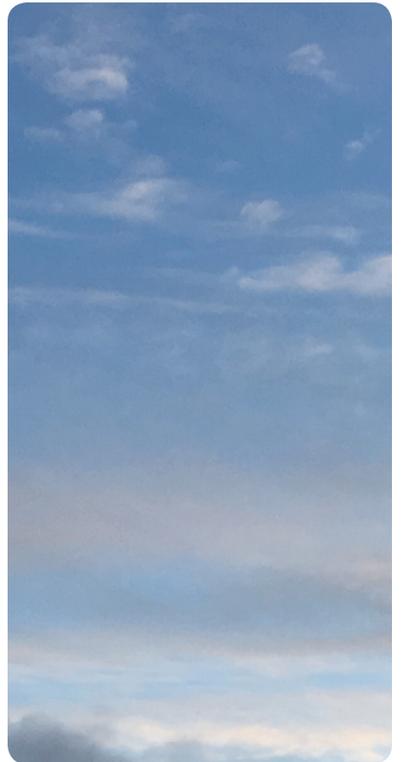
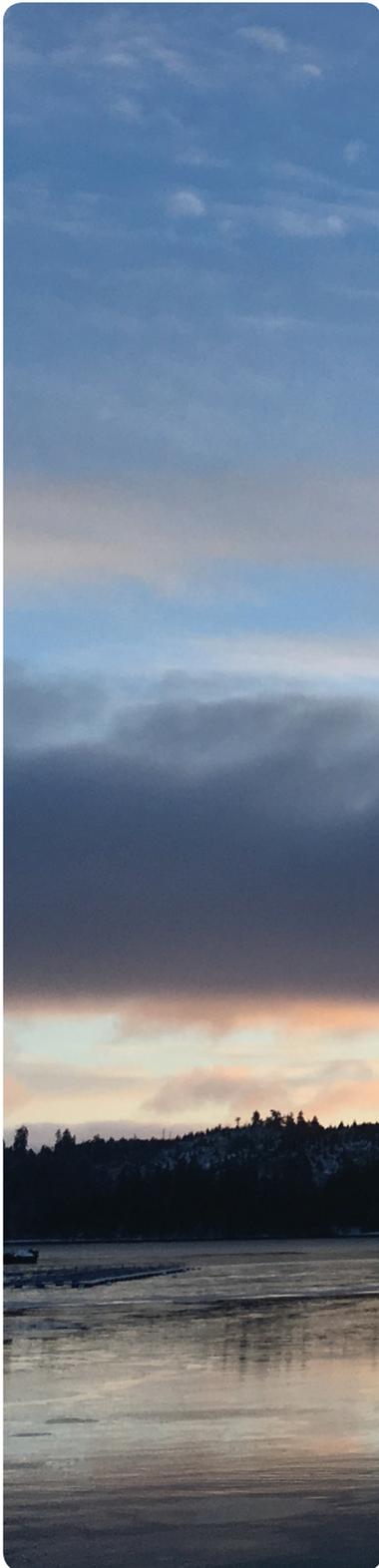
Administration

Tina Fairbanks
Executive Director

Tammy Hulsey
Administrative Office Manager

Megan Holland
Administrative Assistant

Trenten Dodson
Production and Operations

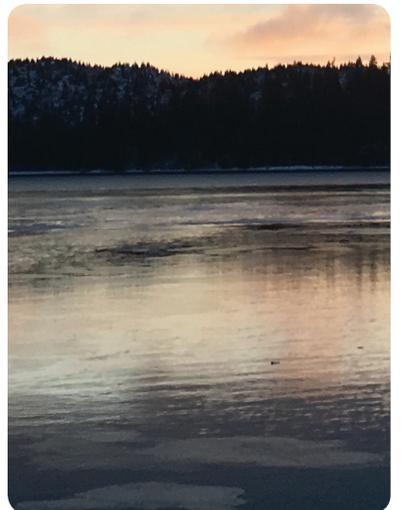


Pillar Creek Hatchery

Al Seale
Manager

James "Hawk" Turman
Assistant Manager

Lauren Bailey
Fish Culturist

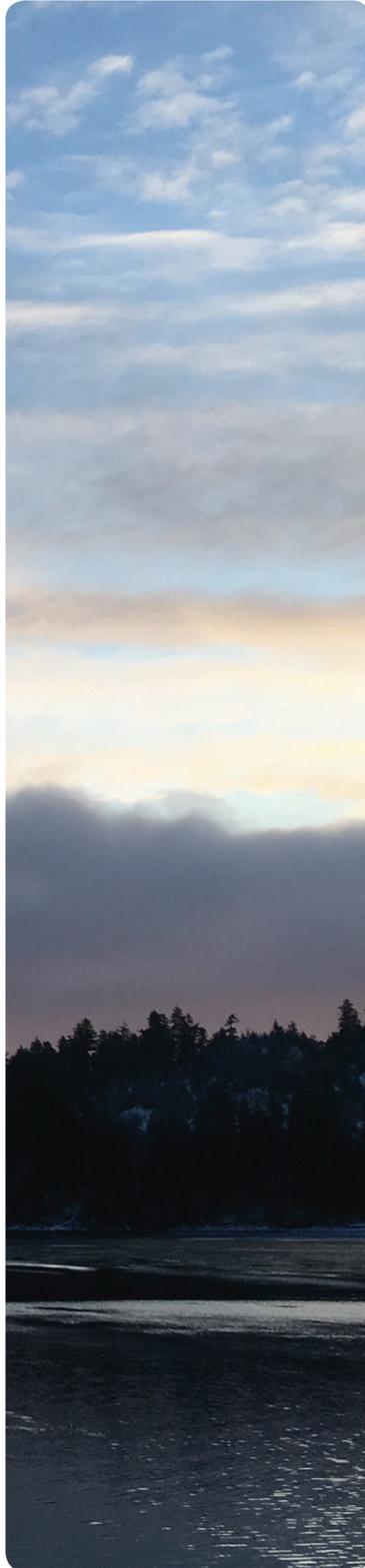


Research & Monitoring

Nathan Weber
Manager

Joe Bottoms
Assistant Manager

Jodi Estrada
Biologist



Kitoi Bay Hatchery

Randy Mason
Manager

Mike Wachter
Assistant Manager

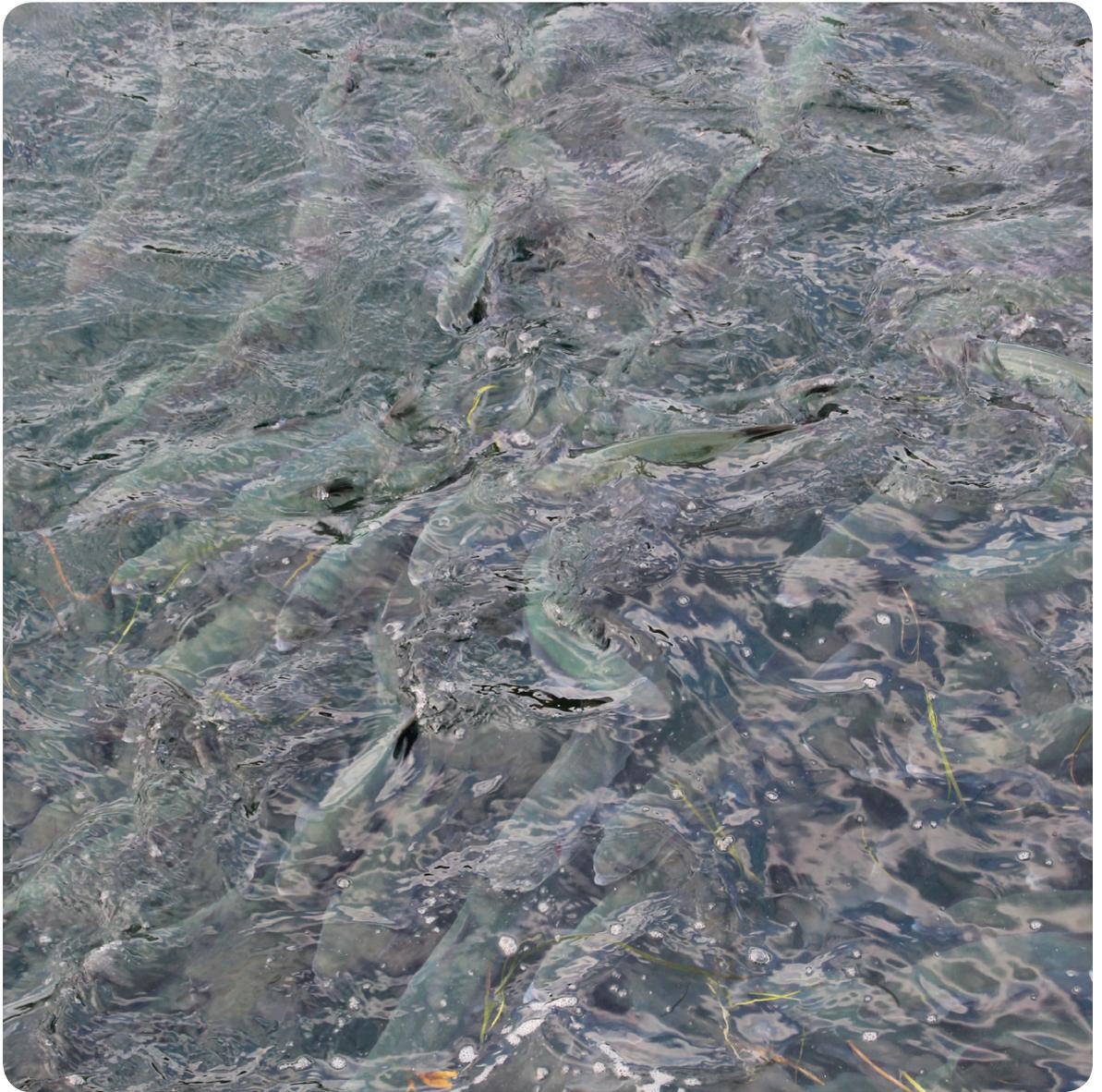
Chet Thomas
Fish Culturist

John Vinci
Fish Culturist

Tina Thomas
Fish Culturist

Mark Young
Fish Culturist

Chuck Jorgensen
Maintenance Manager



KODIAK REGIONAL  AQUACULTURE ASSOCIATION

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