

2019

Annual Report





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Left: A Trail Lakes Hatchery staff member watches as net pens full of sockeye smolt are towed to Thumbs Cove for release, Resurrection Bay, 2019.

Cover: Setnetting for Cook Inlet sockeye salmon, 2019.



From the President



The summer of 2019 was hot and dry. All over Cook Inlet low water and high temperatures in streams led to bad salmon recruitment. The 89°F temperature observed at the Kenai airport in July beat the previous record by 7°. The average July temperature has been above 55° for seven years in a row and in 20 of the 23 years since 1997. By contrast, in the 24 years between 1973–1996, the July average temperature exceeded 55° only four times.

Both of the minimum January temperatures (-45°) were set before 1996 and the average temperatures for that month in the 1973–1996 era was 14.0°. For the 1997–2019 period the average is 16.7°.

We can see that average temperatures in January have a range of 32.8° (-2.6° in 1989 to 30.2° in 2014) while July averages range only 12.2° (47° in 1991 to 59.2° in 2004). That makes sense—our maritime climate can take a chill from Interior Alaska during the winter, but during the summer the Interior can be hot. Ocean-influenced temperatures are mild, summer and winter.

Scientists say climate change is driven by air pollution, especially carbon dioxide. Without a doubt Cook Inlet Aquaculture Association (CIAA) should be part of local discussions to reduce pollution. Because salmon depend on clean, cool water, we should formulate plans to handle future droughts.

CIAA manages four flow control structures. Are there other lakes where similar dams could help? Streams and lakes benefit from shade provided by trees and brush. The Kenai Peninsula Borough has a 50-foot habitat protection district adjacent to anadromous streams, rivers, and lakes to promote vegetation. That setback is threatened as a Borough task force examines it in the coming months. Former CIAA Executive Director Gary Fandrei made a presentation to a similar task force in September 2012. He highlighted the need for suitable vegetation for juvenile and adult salmon. CIAA should offer their expertise to the current task force.

In March 2016 CIAA staff participated in a Climate Adaption for Coastal Communities Training workshop. I'm relieved that CIAA has kept informed on this subject. We need to continue to do so. Salmon have probably been in Cook Inlet for thousands of years. But how often have they seen temperatures of 89°? And what will keep the temperature from going higher?

Brent Johnson, President, Board of Directors

Temperatures at Kenai Airport						
Year	Jan high	Jan low	Ave	Jul high	Jul low	Ave
2019	41	-8	19.7	89	42	58.8
2018	43	-16	19.7	78	43	56.8
2017	40	-30	9.5	71	41	55.4
2016	41	11	28.9	76	43	58.4
2015	46	-10	20.4	70	43	55.9
2014	49	2	30.2	72	39	55.7
2013	38	-20	22.9	75	44	55.6
2012	33	-28	-2.2	72	36	52.9
2011	43	-18	19.9	70	36	53.6
2010	40	-10	21.1	73	37	55.8
2009	45	-34	10.2	73	39	56.9
2008	41	-26	13.3	72	38	54.8
2007	44	-27	16.4	71	39	56.2
2006	37	-27	10.3	71	37	56.6
2005	40	-18	17.8	74	41	58.5
2004	39	-30	4.1	79	43	59.2
2003	40	-14	24.9	81	40	58.4
2002	41	-17	25.1	79	37	55.2
2001	41	-3	27.0	68	43	55.1
2000	36	-27	9.5	66	39	53.6
1999	48	-26	9.9	74	34	55.1
1998	36	-26	13.4	73	39	55.2
1997	45	-33	11.6	75	45	57.0
1996	34	-26	1.6	72	39	52.4
1995	41	-30	13.8	69	42	52.3
1994	42	-25	18.9	72	39	52.6
1993	38	-24	10.9	82	38	56.5
1992	41	-8	17.0	74	43	53.6
1991	42	-18	11.7	71	38	47.0
1990	38	-25	10.6	71	43	50.3
1989	38	-45	-2.6	79	40	51.2
1988	38	-19	17.4	70	37	49.6
1987	52	-23	18.1	77	43	50.7
1986	37	-1	20.7	71	35	49.4
1985	40	21	25.1	71	40	50.7
1984	39	-28	12.4	67	37	52.4
1983	40	-25	18.8	72	43	57.3
1982	32	-26	7.1	75	37	50.8
1981	43	21	28.6	68	34	51.4
1980	43	-31	9.6	78	40	51.9
1979	39	-8	20.1	73	42	55.6
1978	38	-19	15.1	77	36	49.1
1977	42	13	24.3	68	35	56.0
1976	39	-25	10.4	78	38	52.6
1975	37	-45	26.0	75	38	52.4
1974	23	-25	1.8	65	35	52.3
1973	34	-41	-1.5	65	39	48.4

<https://www.wunderground.com/history/daily/us/ak/kenai/PAEN>

From the Executive Director

Each year brings opportunities and challenges in this business and even opportunities can represent challenges. Cook Inlet Aquaculture Association has been around long enough to plan for the unexpected, but the 2019 summer of Alaska's hottest weather on record was truly a surprise for everyone. Despite the effects that these extreme weather conditions may have had on our operations, the Association continues to move forward and maintain the focus of further developing and improving the various programs to support healthy salmon populations.



Our mission involves multiple efforts between hatcheries, field work, habitat, education, and service. We constantly seek a balance to achieve an equivalence in value between those efforts, each of which have a reliance upon the other. Each project also possess its own value determined by those who perceive or receive the benefits. The Board of Directors guide the organization with all those factors in mind.

The Association continues to focus efforts of bringing two hatcheries under project development online simultaneously. Tutka Bay Lagoon Hatchery demonstrated the ability to successfully achieve egg-take goals in 2017 and 2018. The shortage in 2019 was the result of the predicted return not materializing. Port Graham Hatchery experienced similar results. Both locations are well prepared for achieving goals in 2020. Trail Lakes Hatchery was successful in meeting egg-take goals for all of their projects except the Lower Cook Inlet stocking projects, which is a collaboration with Tutka Bay Lagoon Hatchery.

The organization was challenged in 2019 with the cost recovery goal not being achieved in both Resurrection Bay and Tutka Bay Lagoon. The shortfall was minimized by using other Special Harvest Areas but the gap was insurmountable. The returns of sockeyes in Resurrection Bay and pinks in Tutka Bay appeared normal early in the runs, then fish abruptly stopped coming in. Similar occurrences happened in other areas of the state as well. It is likely that high water temperatures and low freshwater flows contributed to events at Tutka Bay Lagoon and Port Graham hatcheries.

Those challenges forced ingenuity. We could not change things beyond our control but we could maximize the resources that were still left to us. The Board of Directors guided the staff so the organization could deal with the challenge of the revenue shortfall by managing finances without jeopardizing projects for 2019 and forward into 2020.

Our focus on field projects is another area of both opportunity and challenge with our ongoing efforts to combat harmful invasive species, specifically elodea and northern pike. We continue to focus efforts both in the field and through partnerships with other agencies and organizations to protect the habitats needed for self-sustaining salmon stocks. We continue efforts to monitor adult escapements and smolt migrations in the Susitna drainage, Kenai Peninsula, and Lower Cook Inlet region. This provides valuable data to assist with the monitoring of program success as well as fisheries management. On location enumeration has proven to provide greater accuracy over aerial surveys, which can impact decisions made by fisheries managers when determining whether or not to open fishing opportunity for users.

Our contributions to individual specific areas are sometimes difficult to enumerate. Areas with significant habitat work are a great examples. We know that activities such as notching a beaver dam that is holding back migrating salmon or building a roughened channel to allow for juvenile salmon migration have positive impacts. Just as providing sockeyes for Resurrection Bay and China Poot benefits the organization for potential cost recovery, as well as to commercial, sport, and personal use (China Poot) harvesting.

The work of the Board of Directors and staff continues to position the Association to meet the challenges and make the most of opportunities to support the region's wild salmon resource.

Dean Day, Executive Director

Mission

Cook Inlet Aquaculture Association is a nonprofit regional association which exists to:

- protect self-sustaining salmon stocks and the habitat upon which they depend;
- rehabilitate self-sustaining salmon stocks;
- rehabilitate salmon habitat; and
- maximize the value of the Cook Inlet (Area H) common property salmon resource by applying science and enhancement technology where appropriate.

Goals

To accomplish this mission the Board of Directors of Cook Inlet Aquaculture Association will:

- Seek protection of salmon habitat through active participation (testimony, committee work, data input, etc.) in planning, permitting and enforcement processes.
- Conduct salmon rehabilitation and enhancement projects which can be expected to significantly contribute to common property fishery harvests. An average harvest rate of 50% in the common property fishery is the acceptable standard for “significant contribution.” This standard does not apply during project development or to projects designed solely for cost recovery harvest.
- Conduct evaluation activities which increase the effectiveness of project implementation.
- Engage in research which advances the state of enhancement/rehabilitation technology.
- Be sensitive to the interests of those harvesting the Area H common property salmon resource.
- Educate the public about the salmon resource and the mission, goals and projects of the Association.
- Maintain the highest standards of financial responsibility and accountability for the funds entrusted to it.
- Maintain facilities, administrative practices and personnel policies which require and encourage its staff to perform in a safe, professional and cost-effective manner.
- Comply with all statutes and regulations governing private nonprofit aquaculture association activities in the State of Alaska.
- Participate, within the limits for tax-exempt corporations, in the development of legislation and regulation relevant to attainment of the mission.



Photo courtesy of Josh Newton



Photo courtesy of Satch Bowe



Photo courtesy of Max Klingenstein

CIAA is an organization that engages and includes salmon users from all fisheries. From left: commercial drift net fishing in the Cook Inlet salmon fishery; personal use fishing for China Poot sockeye salmon; and sport harvesting from the Resurrection Bay sockeye fishery. The China Poot and Resurrection Bay sockeye fisheries are provided for by CIAA.

Board of Directors

Cook Inlet Aquaculture Association is governed by a volunteer board of directors dedicated to providing and protecting the salmon resources of Cook Inlet for all user groups. Although most board members are appointed by the organization they represent, the Inlet Wide Commercial Fishermen Representatives are elected every three years by all Area H permit holders. Below are the board members, the committees they serve on, and their alternates as of January 27, 2020.

Cook Inlet Fishermens' Fund

Steve Vanek R/L

Dave Martin, Treasurer E/F/H/P/R

Alternates

Mark Ducker

Chris Garcia

Mark Ducker

Chris Garcia

Cook Inlet Seiners Association

Malcolm Milne E/H/P

Jacob Wise H

Vacant

Vacant

Inlet Wide Commercial Fishermen

Representatives

Robert Correia H

Robert Roth H

Paul Roth H

Eric Winslow

Vacant

Caroline Correia

Vacant

Vacant

Vacant

Vacant

North Pacific Fisheries Association

Jessie Nelson, Secretary E/H

John Gucer

Ian Pitzman

Ian Pitzman

Kenai Peninsula Borough

Dale Bagley, 1st Vice President E/F/L Vacant

Cook Inlet Region, Inc.

Paul Shadura II F/L

Vacant

City of Kachemak

Beaver Nelson,
2nd Vice President E/H

Glenn Carroll

Processor Representative

Tim Schmidt H/R

Matt Haakenson

Nate Berga E/G/H

Alternates

Bob Nathanson

Vacant

Vacant

Northern District Set Netters of Cook Inlet

Gary Swan P

Page Herring

Darrel Swan

Bob Cellers

United Cook Inlet Drifters Association

Roland Maw

Dyer VanDevere P

Steve Tvenstrup

Steve Tvenstrup

Kenai Peninsula Fisherman's Association

Brent Johnson, President E/F/H/P/R

Joseph Person

Will Faulkner

Will Faulkner

Matanuska-Susitna Borough

Kirsten Dixon P

Vacant

Port Graham/Nanwalek Representative

Vacant

Vacant

City of Homer

Dan Miotke

Al Ray Carroll

City of Seward

Jess Sweatt

Vacant

Committee Membership

E = Executive Committee

F = Finance Committee

G = Grievance Committee

H = Hatchery Committee

L = Legislative Committee, also includes Matt Alward

P = Public Relations Committee

R = Regional Planning Team



Hatcheries

In Alaska, salmon hatcheries supplement natural production and promote stability in the year-to-year harvest of salmon by all users—personal, sport, subsistence, and commercial. In the Cook Inlet region, CIAA maintains four salmon hatcheries: Eklutna, Trail Lakes, Tutka Bay Lagoon, and Port Graham. Salmon are raised in the hatcheries from eggs to fry or smolt, then released to the ocean.

Trail Lakes Hatchery

Located near Moose Pass, Trail Lakes Hatchery is operated by CIAA and owned by the State of Alaska. Salmon have been stocked by CIAA from this location since 1990.

Trail Lakes Hatchery operates as a rearing facility only. No returns or releases occur directly at the hatchery itself but occur at other locations. The primary production is sockeye salmon along with a lesser amount of coho salmon as reflected in the 2019 releases. In 2019, the Resurrection Bay net pens were towed to Thumbs Cove for release of 1.5 million sockeye smolt. This strategy was put into place in 2018 to hopefully minimize feeding on the released smolt by whales, birds, and other predators. In 2020, CIAA will see the first return of adult salmon from this new strategy.

Egg-take season for Trail Lakes Hatchery in 2019 was a mixed bag. Goals were met for the Bear Lake sockeye program where just over 5.1 million green eggs were collected. Hidden Lake sockeye egg collections was also

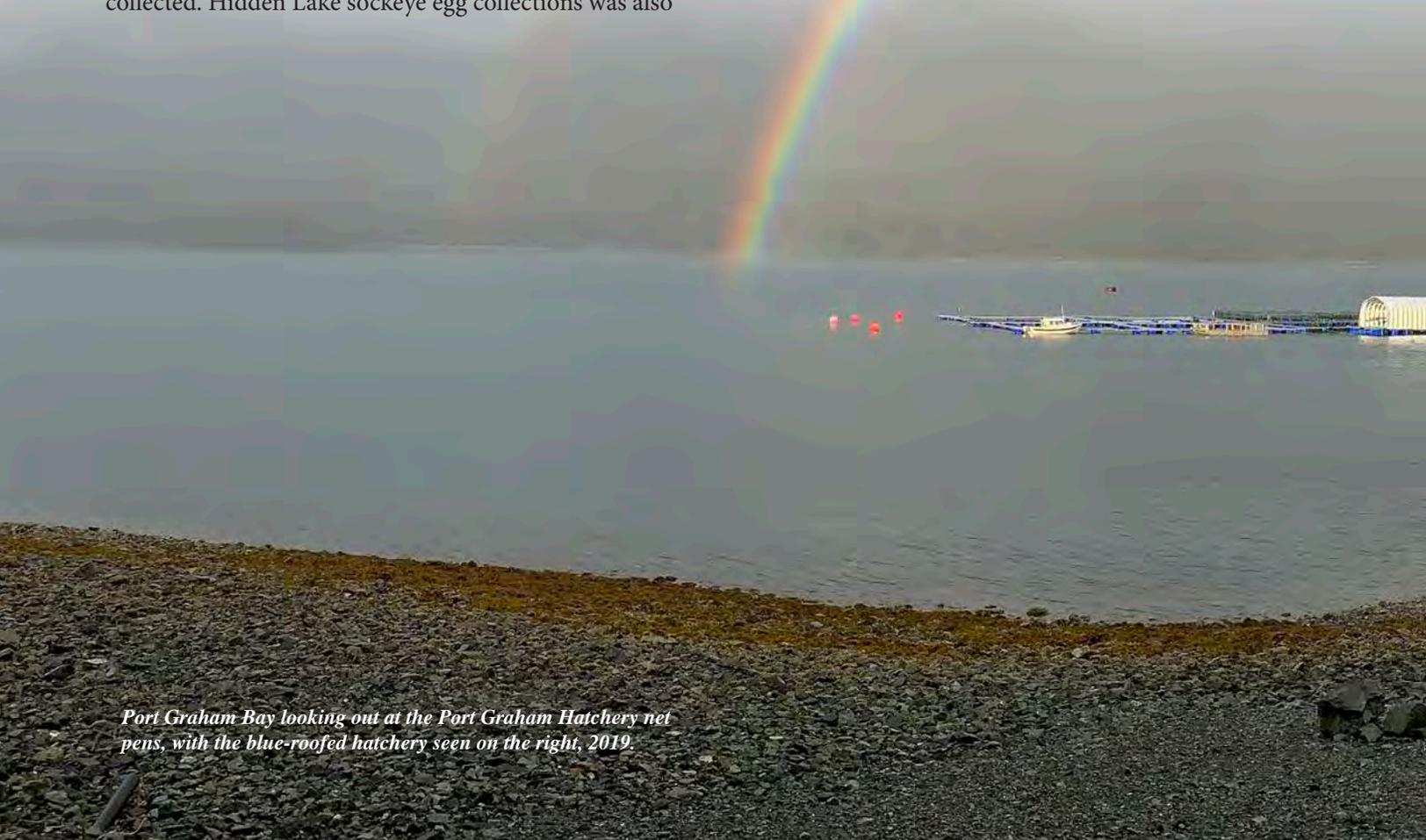
2019 Releases of sockeye and coho salmon, Trail Lakes Hatchery

Location	Species	Stock	Stage	Number
Resurrection Bay	Sockeye	Bear Lake	Smolt	1,510,000
Tutka Bay Lagoon	Sockeye	Tutka/English Bay Lakes	Smolt	427,000
Bear Creek	Coho	Bear Lake	Smolt	61,000
Shell Lake	Sockeye	Shell Lake	Smolt	15,230
Bear Lake	Sockeye	Bear Lake	Fry	2,427,000
Hidden Lake	Sockeye	Hidden Lake	Unfed Fry	1,094,000
Hazel Lake	Sockeye	Tutka/English Bay Lakes	Fry	1,293,000
Kirschner Lake	Sockeye	Tutka/English Bay Lakes	Fry	258,000
Leisure Lake	Sockeye	Tutka/English Bay Lakes	Fry	1,085,000
Bear Lake	Coho	Bear Lake	Fry	453,000
Total				8,623,230

2019 Egg Collection, Trail Lakes Hatchery

Location	Species	Stock	Goal	Green eggs
Bear Lake	Sockeye	Bear Lake	6,022,000	5,176,809
Hidden Lake	Sockeye	Hidden Lake	1,266,000	1,260,983
Tutka Bay Lagoon	Sockeye	Tutka	5,691,000	1,793,343
Bear Lake	Coho	Bear Lake	565,000	604,869
Total				8,836,004

successful at 1.26 million green eggs. Egg take for the Bear Lake coho was on target with just over 600,000 eggs. Trail Lakes Hatchery houses the Lower Cook Inlet sockeye stocking program. Broodstock collection for this program occurs at the Tutka Bay Lagoon Hatchery. The goal for this program was 5.6 million green eggs and just under 1.8 million green eggs were collected at Tutka Bay Lagoon and moved to Trail Lakes Hatchery in 2019. This will impact future stocking plans at Tutka Bay Lagoon; Kirschner Lake; and Leisure and Hazel lakes.



Port Graham Bay looking out at the Port Graham Hatchery net pens, with the blue-roofed hatchery seen on the right, 2019.

Port Graham Hatchery

Port Graham Hatchery, located in the community of Port Graham, was purchased by CIAA in 2014 and put back into operation. This hatchery is a pink salmon hatchery, permitted to incubate up to 125 million pink salmon eggs. In 2019, Port Graham Hatchery released 10,144,850 pink salmon fry into Port Graham Bay. Port Graham Hatchery experienced a disappointing pink salmon return in 2019. Although the goal was to collect 84 million green pink salmon eggs in 2019, just over 7.8 million green pink eggs were collected.

Tutka Bay Lagoon Hatchery

Tutka Bay Lagoon Hatchery, located in Kachemak Bay, is a State-owned and CIAA-operated facility. This facility has been in operation since the late 1970s originally under ADF&G. CIAA took over operation and released salmon in 1991. In the 2000s operations were suspended for several years and reopened for pink salmon aquaculture in 2011.

In 2019, CIAA successfully stocked 85,580,339 pink salmon fry into Tutka Bay Lagoon. In addition to the less than projected pink salmon run returning this year, extremely low creek levels also hindered egg collection at Tutka Bay Lagoon. Just over 39 million green pink salmon eggs were collected, falling well below the goal of 125 million eggs.

Eklutna Salmon Hatchery

Eklutna Salmon Hatchery, located near Palmer, is owned

by CIAA. Although the hatchery has not been in operation since 1998, it serves as a temporary rearing facility for sockeye and coho smolts during the water shortages at the Trail Lakes Hatchery. The facility is also used by the Alaska Department of Fish and Game (ADF&G) to imprint and release Chinook and coho salmon smolt prior to their release to the Eklutna Power Plant Tailrace.



*Hatching pink fry,
Port Graham Hatchery, 2019.*

In November 2018, Southcentral Alaska experienced a magnitude 7.0 earthquake that caused significant structural damage to roads, facilities, and homes including Eklutna Salmon Hatchery. In 2019, CIAA continued to assess the damage to determine the costs to repair the facility.

Although CIAA owns the hatchery buildings, the property is leased from the Department of Natural Resources (ADNR). Over the last few years, CIAA has been working with ADNR to establish conditions for a new lease and it is expected that this process will be complete in 2020.



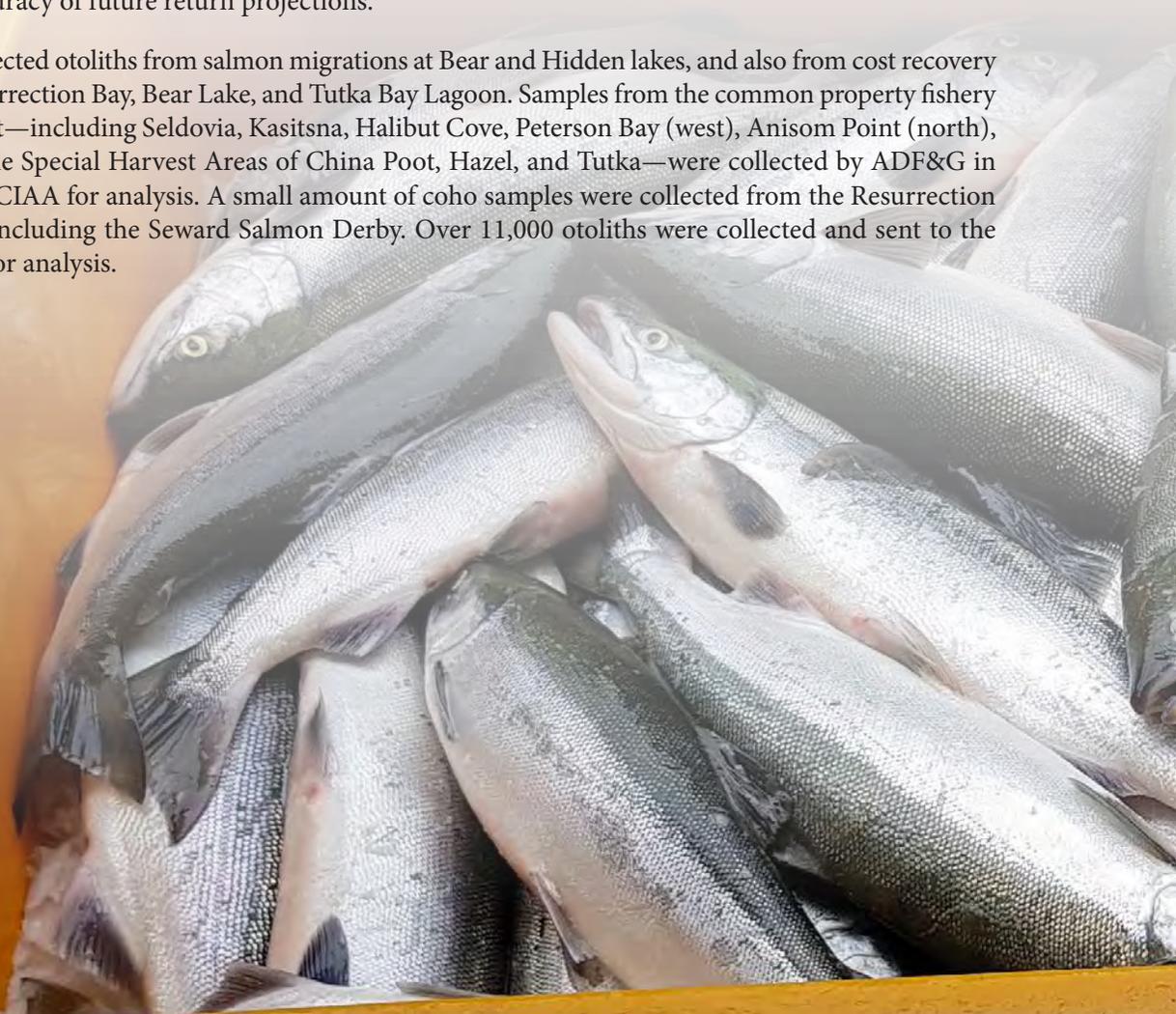
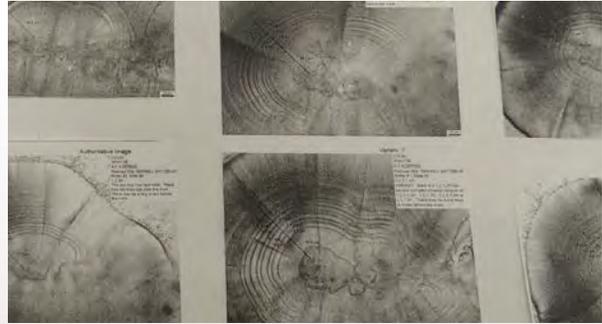
Evaluation

Every year CIAA spends a significant amount of resources in terms of staff time, equipment (boilers, piping infrastructure), and fuel toward thermal marking salmon incubated and reared in the hatcheries. Thermal marking, the process of putting a distinct mark on a fish's otolith (ear bone) once the eggs have reached the eyed stage, is done by heating the hatchery water in a particular pattern. This pattern, called a "thermal mark code," is assigned by ADF&G and is specific to each stock or area where salmon are released.

When the thermally-marked fish migrate out of a watershed as juveniles or return as adults, CIAA staff removes the otoliths from the fish to identify which fish were incubated in a hatchery. In the laboratory, the otoliths are analyzed for the unique and distinct mark—a mark that will provide the fish's origin and age. The results provide CIAA with valuable information as to how well the hatchery program is working and the population characteristics of juveniles and returning salmon. This information can then be used to adjust the hatchery program to achieve the best survival rates possible. Data collected from the smolt otoliths are also used in models to forecast adult returns, thereby improving the accuracy of future return projections.

In 2019, CIAA collected otoliths from salmon migrations at Bear and Hidden lakes, and also from cost recovery harvests from Resurrection Bay, Bear Lake, and Tutka Bay Lagoon. Samples from the common property fishery in lower Cook Inlet—including Seldovia, Kasitsna, Halibut Cove, Peterson Bay (west), Anisom Point (north), Otter Cove, and the Special Harvest Areas of China Poot, Hazel, and Tutka—were collected by ADF&G in 2019 and given to CIAA for analysis. A small amount of coho samples were collected from the Resurrection Bay sport fishing including the Seward Salmon Derby. Over 11,000 otoliths were collected and sent to the CIAA laboratory for analysis.

Top: Project Technician Cathy Cline, in the center, assists with a training session on how to remove the tiny otoliths from salmon. Bottom: Magnified images of otolith marks from various Alaska hatcheries.



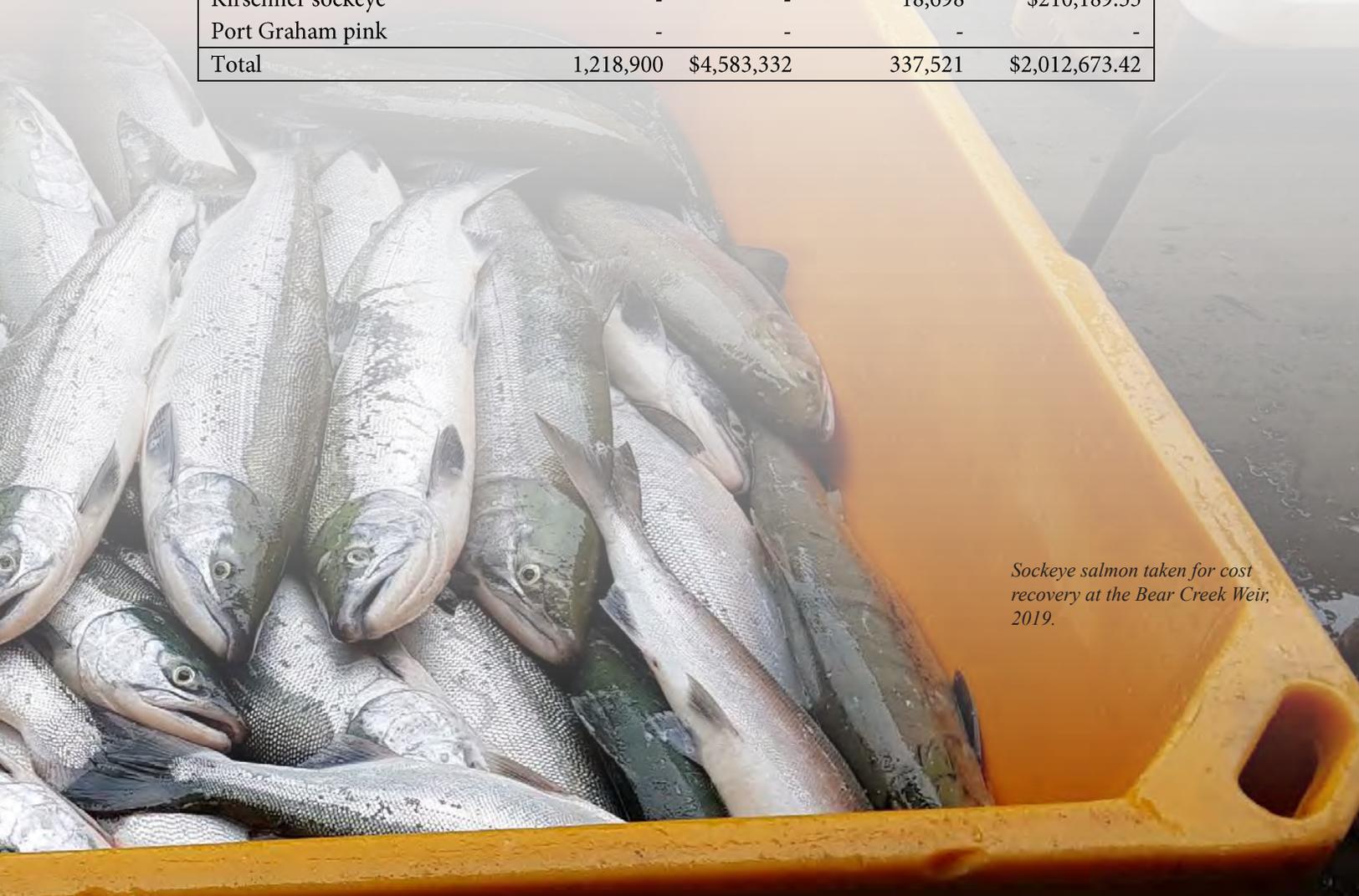
Cost Recovery

To recover operational costs for the hatchery programs, CIAA develops cost recovery harvest plans for areas where hatchery-raised fish will be returning. These areas are known as Special Harvest Areas (SHAs) and are developed in cooperation with ADF&G. Through a public bidding process, CIAA licenses access to these SHAs to processors. The objective is to reach the cost recovery goal as quickly as possible and then open the SHA to the commercial fleet. Until all hatcheries reach full production, CIAA must rely on a large portion of fish returns to the SHAs.

In 2019 CIAA was not able to meet the cost recovery goal. CIAA anticipated larger returns in many areas including Resurrection Bay, which is where cost recovery takes place for the Bear Lake sockeye program. Because of this, CIAA had hoped to not conduct cost recovery from the China Poot (Leisure), Hazel, or Kirschner SHAs. But due to the reality of the smaller runs at Resurrection Bay (sockeye) and Tutka Bay Lagoon (sockeye and pink), CIAA went ahead with cost recovery on fish from these stocking programs. No cost recovery was planned for Port Graham, nor did the resulting pink return justify CIAA looking at adding it to cost recovery.

2019 Cost Recovery Summary

Location/salmon species	Prediction		Actual	
	Number of fish	Revenue	Number of fish	Revenue
Bear Lake sockeye saltwater	230,000	\$2,986,698	82,685	\$1,065,821.92
Bear Lake sockeye freshwater	3,500	\$28,497	41,263	\$347,592.28
Tutka sockeye	40,400	\$271,270	10,596	\$120,997.63
Tutka pink	945,000	\$1,296,867	179,639	\$220,843.08
Leisure/Hazel sockeye	-	-	4,640	\$47,228.98
Kirschner sockeye	-	-	18,698	\$210,189.53
Port Graham pink	-	-	-	-
Total	1,218,900	\$4,583,332	337,521	\$2,012,673.42



Sockeye salmon taken for cost recovery at the Bear Creek Weir, 2019.

Monitoring

Each year, CIAA operates a number of salmon smolt traps and adult salmon weirs to collect data on the numbers of salmon moving up or downstream. There are two main reasons why CIAA operates salmon traps and weirs each year—to help evaluate the hatchery programs; and to evaluate naturally-produced fish populations. The data collected are used by ADF&G for salmon fisheries management, which can and has opened up fishing opportunities for the common property.

2019 Smolt Counts

Site	Species	Stock	Number
Bear Lake	Sockeye	Bear Lake	972,810
	Coho	Bear Lake	67,049
Hidden Lake	Sockeye	Hidden Lake	389,685
	Coho	Hidden Lake	16,819
Kasilof River	Sockeye	Tustumena Lake	5,314,186 ^a
Kirschner Lake	Sockeye	Tutka	52,737 ^b

2019 Adult Counts

Site	Species	Stock	Total
Bear Lake	Sockeye	Bear Lake	12,760
	Coho	Bear Lake	3,350
Delight Lake	Sockeye	Delight Lake	17,410
Hidden Lake	Sockeye	Hidden Lake	5,833 ^b
Shell Lake	Sockeye	Shell Lake	16

a. This is an estimated count based using mark-recapture stratified sampling design.

b. This is a partial count due to a closure of the trap or weir in 2019.

For the 20th year, CIAA operated a smolt trap on the Kasilof River to enumerate salmon smolt leaving Tustumena Lake. Although this run of salmon has not been part of any hatchery enhancement project since the mid-2000s, CIAA continues to operate the smolt trap because Tustumena is the second biggest producer of Upper Cook Inlet sockeye salmon and provides significant fishing opportunity for all users. The smolt-out information is reviewed by ADF&G alongside the adult counts they collect via sonar in the Kasilof River, to assist in fisheries management. The 2019 estimated sockeye smolt count was about 5.3 million fish.

Bear Lake smolt production continued to be strong in 2019 with nearly 973,000 sockeye and 67,000 coho smolt counted. At Hidden Lake, another project with decades of smolt and adult salmon data, CIAA counted nearly 390,000 sockeye smolt, significantly higher than the 14,000 smolt counted in 2018.

A new sockeye smolt monitoring project at Kirschner Lake on the west side of Cook Inlet was initiated in 2019. This project is intended to help evaluate the freshwater survival from fry to smolt of sockeye fry stocked from CIAA's Trail Lakes Hatchery. About 53,000 sockeye smolt were counted leaving the lake, but this count missed four days during what appeared to include the peak of the run. A flash flood prevented the field crew from operating the trap during this time frame.

The 2019 estimated adult sockeye salmon return to Resurrection Bay and Bear Lake was about 137,000 fish (12,760 counted at the Bear Lake Weir combined with the estimated cost recovery harvest in Resurrection Bay at about 124,000 fish). This number does not reflect what has harvested in the sport fishery. Although this was short of the original projection, it was still a decent run with large numbers of Resurrection Bay sport fishermen enjoying the harvesting opportunity.

Due to the Swan Lake Fire, which had made its way near the Hidden Lake adult counting weir, CIAA had to shut down the weir in mid-August, nearly a month early. The field crew counted just under 5,900 adult sockeye salmon returning to the lake before the closure.

At Shell Lake, CIAA operated a weir and counted 16 sockeye salmon entering the lake, which was not a surprise given the current status of that salmon population (see page 13).

For the second year, CIAA counted the adult salmon returning to Delight Lake via a weir. This is a naturally-produced run that CIAA has chosen to monitor with the goal of increasing fishing opportunity. This weir was originally operated by ADF&G but in more recent years, they relied solely on aerial surveys to count salmon in Delight Lake. The on-the-ground counting is more accurate than the aerial surveys that may have missed fish that were deep in the lake. The CIAA counts have shown adequate escapement, allowing for common property fishing to take place. In 2019, about 17,000 sockeye salmon were counted returning to Delight Lake. In contrast, the peak aerial count by ADF&G for this system in 2019 was 1,130 sockeye salmon, short of what was needed to open up commercial fishing. Thus ADF&G used CIAA's weir count to inform the decision to open up the fishing in 2019.



Hidden Lake sockeye smolt, 2019. Hidden Lake has limited spawning areas, but it provides good rearing habitat, thus making it a great project for hatchery stocking. The Hidden Lake smolt are typically the largest smolt seen in CIAA's monitoring projects, attesting to the productivity of Hidden Lake.

Habitat & Invasive Species

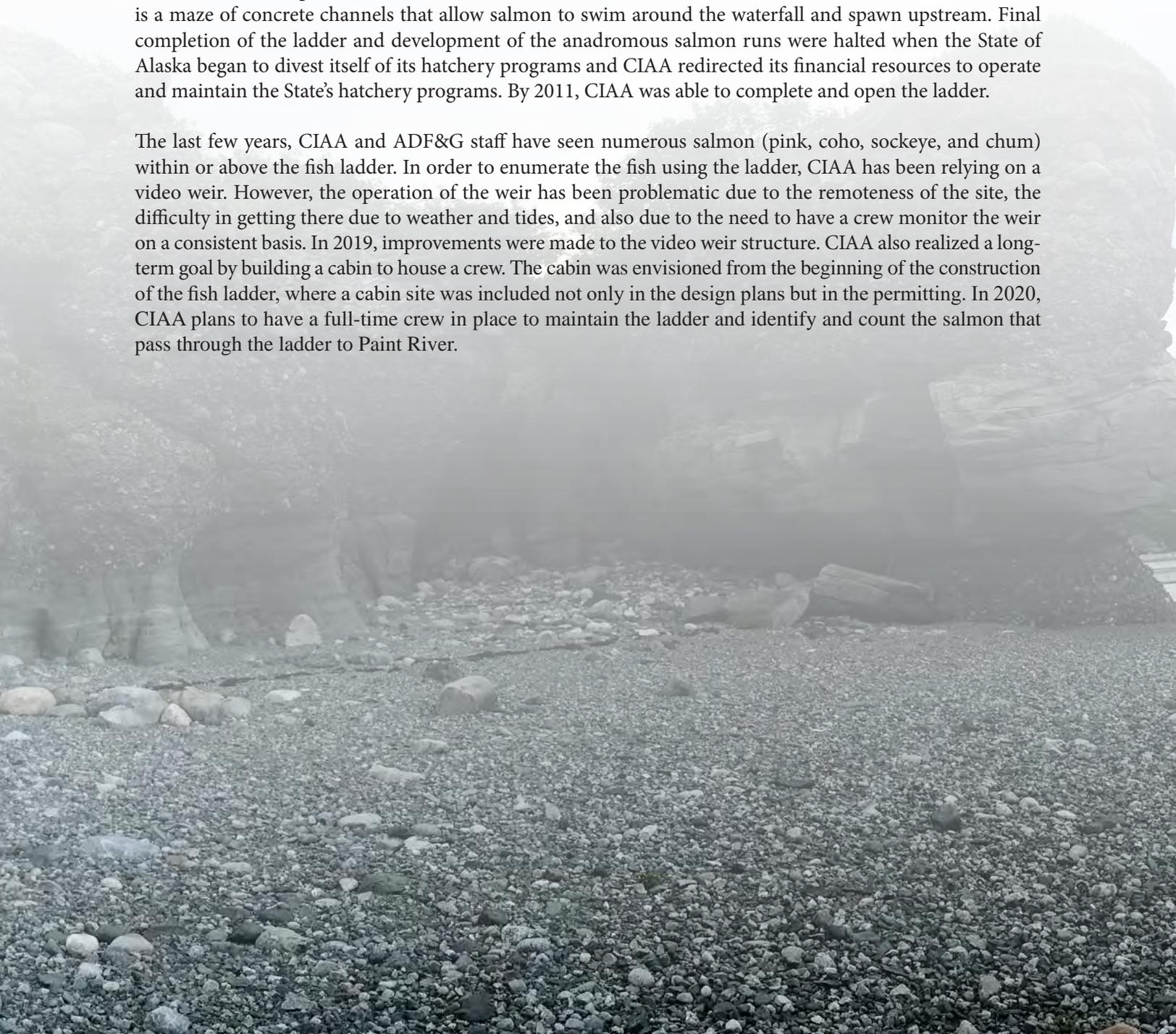
Cook Inlet Aquaculture Association prioritizes the importance of understanding, maintaining, and improving salmon habitat and self-sustaining fish populations through its efforts to monitor smolt and adult salmon populations (see page 10), control/eradicate invasive species, provide adequate water flows through migration corridors, removal of seasonal barriers to fish migration, construction of spawning channels and fish ladders, and implementation of fish habitat projects.

Paint River Fish Ladder

Over the years, CIAA has worked on a number of fishway projects, but the most ambitious one is the Paint River Fish Ladder. Paint River is located on the east side of the Alaska Peninsula in Kamishak Bay, lower Cook Inlet. The Paint River system, which enters Kamishak Bay over a 40-foot waterfall at tidewater, has never had a self-sustaining run of salmon but has long been recognized as having significant potential for natural colonization.

In 1991, CIAA completed construction of a fish ladder to circumvent the falls at the mouth of Paint River. It is a maze of concrete channels that allow salmon to swim around the waterfall and spawn upstream. Final completion of the ladder and development of the anadromous salmon runs were halted when the State of Alaska began to divest itself of its hatchery programs and CIAA redirected its financial resources to operate and maintain the State's hatchery programs. By 2011, CIAA was able to complete and open the ladder.

The last few years, CIAA and ADF&G staff have seen numerous salmon (pink, coho, sockeye, and chum) within or above the fish ladder. In order to enumerate the fish using the ladder, CIAA has been relying on a video weir. However, the operation of the weir has been problematic due to the remoteness of the site, the difficulty in getting there due to weather and tides, and also due to the need to have a crew monitor the weir on a consistent basis. In 2019, improvements were made to the video weir structure. CIAA also realized a long-term goal by building a cabin to house a crew. The cabin was envisioned from the beginning of the construction of the fish ladder, where a cabin site was included not only in the design plans but in the permitting. In 2020, CIAA plans to have a full-time crew in place to maintain the ladder and identify and count the salmon that pass through the ladder to Paint River.



Elodea & northern pike

Under a grant from the Alaska Sustainable Salmon Fund, a CIAA crew spent a second summer at Whiskey and Hewitt lakes in the Susitna watershed harvesting invasive northern pike and taking samples for analysis. The Whiskey–Hewitt lake system is home to a population of northern pike, which is thought to have contributed to the decline of juvenile salmon due to predation. In 2019, the CIAA crew harvested about 1,780 northern pike from these lakes. This project is a multi-year collaborative effort with ADF&G who perform acoustic fry surveys at Hewitt Lake each fall. It is hoped that the abundance of juvenile sockeye salmon rearing in Hewitt Lake will increase to 1,000,000 by the fall of 2020, which was the approximate abundance of fall fry as estimated by ADF&G in 2005.

At Shell Lake CIAA continued a salmon rehabilitation project through activities including a special stocking program to preserve and restore the genetic lineage of the Shell Lake sockeye salmon. Shell Lake, in the Susitna watershed, once supported a large salmon population. In 2006, almost 70,000 sockeye salmon were counted returning to Shell Lake, but that number dove to just three fish in 2015. Northern pike predation was one of the main factors having a negative effect on the salmon population. In 2012, CIAA began to invest heavily in a rehabilitation program to try to save this population, which includes the use of Trail Lakes Hatchery to incubate native eggs and grow the fish to the smolt stage for return back to the lake. In 2019 over 15,000 sockeye salmon smolt were released into the system. And the CIAA field staff harvested nearly 1,300 northern pike. The northern pike portion of this work in 2019 was supported by a grant from the Matanuska-Susitna Basin Salmon Habitat Partnership.

Elodea is a common aquarium plant that is not native to Alaska. It is a serious threat to freshwater resources and fish habitat in the Cook Inlet watershed and statewide. CIAA performed full-lake surveys for *Elodea* at Bear and Wadell lakes on the west side of Cook Inlet, in response to a reported sighting of the weed. Fortunately *Elodea* was not found.

Fisheries Technicians Levi Bageant and Jon Shivel harvest northern pike from Shell Lake, 2019.



Akjemuiga Cove, 2019. This is where Paint River enters Kamishak Bay.

Beaver Dams

Surveying streams for obstructions to upstream migration of salmon was one of the first—if not the first—field project CIAA took on as an organization. Beginning in 1978, CIAA initially surveyed between 50 and 100 streams per year and temporarily notched over 50 beaver dams. Since then, well over 150 systems have been surveyed for beaver dams. Notching provides a temporary opening in the beaver dams to allow salmon passage through to spawning areas. Typically there is enough time for salmon to pass before the beavers rebuild the notched area. Beaver dam monitoring and any subsequent notching is an unobtrusive activity that provides benefit for salmon trying to reach spawning areas. Beaver dams are not destroyed by CIAA because, in the long term, the ponds formed by the dams provide valuable juvenile salmon rearing habitat.

With the unusually warm weather and low waters during the summer of 2019, staff ramped up beaver dam surveys. Beaver dams were monitored at the Whiskey, Judd, Talachulitna, Trinity, Movie, Shell, and Coal Creek Lake Creek systems in the Susitna watershed and Daniels and Bear Creek (Tustumena Lake) on the Kenai Peninsula. Several dams were notched that were found holding back salmon such as in Shell Creek where six dams were found impassable.



A view from a beaver dam survey at Judd Lake, 2019. Adequate passage was observed for the migrating sockeye salmon so no dams were notched on this survey of Judd.



Fisheries Technician Derek Castiglione inspects his work after notching a beaver dam on Shell Creek, 2019. Some of the dams notched this year were over four-feet tall.

Limnology & Fertilization

To ensure stocking projects do not alter the natural trophic status of the lakes, CIAA collects samples and measurements from lakes used for fry stocking programs. Samples collected include zooplankton and water; measurements taken include temperature, dissolved oxygen profiles, and light incidence measurements. CIAA works with the ADF&G lab in Soldotna to provide the analyses. The information collected is used to evaluate the projects and ensure appropriate nutrient loading and fry stocking into these lakes. The information is also used to help CIAA determine appropriate fertilization application amounts. In 2019, CIAA collected limnology samples at four lakes—Hidden, Kirschner, Leisure, and Bear.

The purpose of fertilization is to increase the food source for juvenile salmon. The liquid fertilizer, applied to the lakes during the summer, helps propagate phytoplankton growth, which in turn increases zooplankton growth. Several species of zooplankton are major food sources for salmon fry. In 2019, fertilizer was applied to Leisure and Bear lakes.

Water Flow Controls

Water flow control structures are operated by CIAA to ensure adequate water is available for smolt leaving and adult salmon returning into Daniels, Marten, Packers (Kalgin Island), and Bear lakes. These structures alter the flow of water in the streams at these systems by using dam boards set into a barrier across the stream. To adjust the flow, dam boards may be taken out or inserted as needed. While on site, staff removes any obstructions to salmon migration seen in the vicinity.

Because of the warm summer and low waters later in the season, staff monitored and adjusted flow controls more than they would do during a cooler season. Staff also repaired the Packers and Marten structures to ensure their integrity.

Staff traveled to Big Lake in the Matanuska-Susitna Borough to inspect the roughened channel dam structure in response to a public concern. In 2004, CIAA funded, through a grant received from the United States Fish and Wildlife Service, a major habitat improvement to the existing dam structure that lies at the outlet of Big Lake, which is the head of Fish Creek. Sockeye salmon spawn near the outlet and the resultant fry emerge and migrate upstream to the lake. The existing dam structure was an impediment to the fry migration. Under this project, the dam was left in place, while a crew built up the outlet substrate leading to the structure with natural materials such as gravel and boulders. The substrate allows small fish to move easily into the lake. Through placement of the larger boulders, small pools for fry to rest were created.

In 2019, having heard a concern that the structure was holding back additional water, as a service to the community, CIAA sent a crew up there to investigate. The crew found natural and man-made debris covering the dam but the dam was still functioning and not holding back any additional water because of the debris. The crew cleaned out the debris and followed up with a presentation to the Big Lake Community Council on the dam's history and purpose.



Biologist Andy Wizik removes debris from the Big Lake dam structure, 2019.



Marten Creek, 2019.

Outreach & Education

As set forth by CIAA's overarching goals, educating the public about the salmon resource, mission, goals and projects of CIAA are incorporated into every aspect of CIAA operations. Engagement ranges from formal presentations at scientific conferences to just taking a few minutes to explain a weir operation to a curious tourist that might stop by one of the projects on the road system.

Education

One major activity that supports salmon resource stewardship is to teach children (and their parents!) about the life and biology of salmon. Every year, CIAA participates in events where little hands are encouraged to help dissect salmon and learn what makes this fish so special and valued. In 2019, CIAA led salmon dissections for kids at:

- Kenai River Festival
- Kenai National Wildlife Refuge
- ADF&G's Salmon in the Classroom Program held at CIAA's Bear Creek Weir. This year about 370 students from the Kenai Peninsula School District participated in Salmon in the Classroom during an egg take at Bear Creek Weir and these students are incubating salmon eggs in their classrooms from CIAA-reared salmon. CIAA also participated in the year-end celebration event to this program, where students released the coho fry they had been raising in their classrooms.

In recent years, CIAA staff has also provided valuable salmon education through the dissections of northern pike—a great way to teach kids about the threats to salmon in Southcentral Alaska! In 2019, CIAA led dissections for Port Graham and Nanwalek schools. Another highlight from 2019 was receiving a two-year grant award from the Kenai Peninsula Fish Habitat Partnership to provide an assistant educator for the Adopt-A-Stream Program.

The hatcheries also routinely engage in educational activities. Highlights from 2019 include:

- Tutka Bay Lagoon Hatchery hosted a field trip for Seldovia Village Tribe's summer camp. The hatchery also hosted Girls on the Water for a day, which is a week-long kayaking expedition for high school-aged girls focusing on science, art, and wilderness skills.
- Trail Lakes Hatchery continued a long-term partnership with Outward Bound, a nonprofit that provides outdoor education for youth and adults.



Outward Bound students from Colorado, their leaders, and CIAA staff at Bear Creek Weir, 2019. These students helped out at Bear Lake by filling hundreds of sand bags, as well as helping to stain the Bear Creek Weir building.

- Port Graham Hatchery continued its collaboration with Port Graham school to introduce the students to the hatchery in their village while learning about the multiple facets of hatchery work.
- And all the hatcheries provide tours to show the important processes undertaken at the hatcheries and to demonstrate the methods used by technicians when monitoring salmon migrations.

Involvement

Board and staff members regularly serve on committees and participate in other groups/events dealing with issues related to preserving and enhancing salmon fisheries. By reaching out to create partnerships, CIAA is able to leverage resources to make projects and initiatives happen more efficiently and with shared support by many other stakeholders. Involvement in 2019 included:

- United Fishermen of Alaska
- Alaska Salmon Hatchery Alliance
- Matanuska–Susitna Basin Salmon Habitat Partnership
- Kenai Peninsula Fish Habitat Partnership
- Cook Inlet Regional Citizens Advisory Council
- Exxon Valdez Oil Spill Trustee Council’s Public Advisory Committee
- Alaska Invasive Species Partnership
- Kachemak Bay National Estuarine Research Reserve
- Kenai Watershed Forum
- Industry Appreciation Day
- Kachemak State Park Citizen Advisory Board
- Alexander and Sucker Lakes Elodea Task Force
- Seward Silver Salmon Derby



Hands-on learning about salmon anatomy at the Kenai River Festival, 2019.

Another highlight from 2019 was Tutka Bay Lagoon Hatchery staff worked with ADNR, Homer Soil and Water Conservation District, and University of Alaska Fairbanks Cooperative Extension on eradicating orange hawkweed at the hatchery site.

Publications & Media

This year, CIAA redesigned its website to make it more engaging and user friendly. The public can use the website to schedule a hatchery tour, inquire to use the CIAA conference room for an event, follow along with seasonal salmon migration counts, or access current and historical reports and data. The public can also connect with CIAA at [facebook.com/CIAA1976](https://www.facebook.com/CIAA1976). Twice yearly, CIAA sends out its newsletter, *Smolts*, to a broad audience.

Cook Inlet Region

As a private, nonprofit corporation organized under the laws of the State of Alaska, CIAA engages in salmon enhancement and habitat work throughout the Cook Inlet region. This region includes waters of Alaska in Cook Inlet and Resurrection Bay north of Cape Douglas and west of Cape Fairfield including the Barren Islands and all the region's freshwater drainages. The drainage area feeding Cook Inlet is over 38,000 square miles and reaches as far north as Denali and east almost as far as Glenallen. Over half of Alaska's population live in the area—around 460,000 residents.



Financial Summary

As of June 30, 2019

Assets	
Current assets	
Cash	\$5,040,039
Grants receivable	6,661
Loan receivable	-
Other receivables	416,832
Inventory	225,099
Prepaid expenses	19,257
Total current assets	5,707,888
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Construction in progress	516,676
Property, plant, equipment and leasehold improvements, net of accumulated depreciation and amortization	8,881,897
Net property and equipment	9,398,573
Total assets	\$15,106,461
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Liabilities and net deficit	
Current liabilities	
Accounts payable	\$191,868
Accrued payroll liabilities	83,154
Accrued interest	83,856
Notes payable, current	188,414
Total current liabilities	547,292
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Notes payable, less portion classified as current	16,250,863
Total liabilities	16,798,155
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Net deficit	
Temporarily restricted	349,126
Unrestricted (deficit)	(2,040,820)
Total net deficit	(\$1,691,964)
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Total liabilities and net deficit	\$15,106,461

The financial information presented is a summary.

Staff & Locations

Headquarters

Dean Day, Executive Director
Lisa Ka'aihue, Special Projects Manager
Ryan Wagner, Hatchery Operations Manager
Dorey Harman, Accounting Specialist
Andy Wizik, Biologist
Emily Heale, Biologist
Cathy Cline, Project Technician
Jared Grangroth, Fisheries Technician
Liana Gaze, Office Assistant
Ronnie Minter, Temporary Project Technician

40610 Kalifornsky Beach Road, Kenai, Alaska 99611
907-283-5761

Port Graham Hatchery

Mike McWaters, Hatchery Manager
Rob Sangster, Assistant Hatchery Manager
Art Romanoff, Fish Culturist

P.O. Box 5547, Port Graham, Alaska 99603
907-284-2285

Trail Lakes Hatchery

Brett Jenkins, Hatchery Manager
Jennifer Wells, Assistant Hatchery Manager
Mike Komperda, Fish Culturist
Kris Warner, Fish Culturist

P.O. Box 29, Moose Pass, Alaska 99631
907-288-3688

Tutka Bay Lagoon Hatchery

Jessica Eller, Hatchery Manager
Vacant, Assistant Hatchery Manager
Alyssa Mische, Fish Culturist

P.O. Box 3389, Homer, Alaska 99603
907-312-7016

Seasonal & Temporary Staff

Every year CIAA employs seasonal and temporary staff to assist with the day-to-day work at the hatcheries and the field projects. This work is a great opportunity for students in aquaculture, biology, and other environmental fields to gain practical experience. It also affords the opportunity for people to work in or near their own remote communities. Daily tasks include everything from feeding fry and smolt to setting up smolt traps to helping notch beaver dams.

2019 Temporary Fish Culturists & Project

Technicians

Jared Grangroth
Ronnie Minter
Art Romanoff
Alyssa Mische
Alex Walczyk

2019 Fisheries Technicians

Michael Anahonak
Dalion-Scott Baclaan
Levi Bageant
Derek Castiglione
Cody Ciesielski
Patricia Colon
Alyson Crocker
Eric Fotter
Lawrence Grennan
Rachel Harrison
Cole Holland
Mackenzie Klemek
Kristina Long
Sean McMullen
Jax Mikkelsen

Bridgette Nicolosi

Jaz Odner
Kelli Palaka
Samantha Parisi
Eric Pavlicek
Kelsey Potter
Eric Powell
Dalton Quint
Justin Radecki
Marian Shaffer
Jonathan E Shivel
Olga Shivel
Breanna Smart
Alison Stenroos
Brenden Thompson
Gabriel Van Zee
Riley Waterman
Thomas Yeaton
Brandon Zverina

2019 Interns

Ashley Gallaher, *Student Conservation Association*
Johannes Elzinga



Left, Cole Holland and Kristina Long, Resurrection Bay, 2019.
Above, Alyssa Mische and Alison Crocker, Tutka Bay Lagoon Hatchery, 2019.



Cook Inlet
AQUACULTURE
ASSOCIATION

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