

Cost Recovery Scheduled for Two Sites This Season

At its March meeting, the NSRAA Board agreed to split this year's cost recovery harvest between Crawfish Inlet and Southeast Cove.

"I'm really grateful the board chose to do that," says Ben Adams, NSRAA Research and Evaluation Manager. "However the Southeast Cove return shakes out, it gives us more options if there were run failures and the harvest came up short."

NSRAA has been conducting its main cost recovery operations at Crawfish Inlet since 2018, but the returns to Crawfish have been declining recently, while the returns to Southeast Cove and some of NSRAA's other sites on the east side of Baranof showed strong improvement last year. Meanwhile, the organization's budget continues to grow as NSRAA expands its programs and production.

Last year's chum returns to Crawfish came in below forecast and, as a result, NSRAA fell 2.5 percent short of its \$7.48 million goal. Fortunately, it was a small enough number that, combined with strong salmon prices, NSRAA was able to bridge the gap with a last minute cost recovery at Deep Inlet. A larger shortage could be difficult to make up.

Splitting the harvest between two sites not only takes the burden off one site, but also allows NSRAA to harvest both summer and fall stock for its cost recovery.

"We could have a great summer return, and a horrible fall return," Ben says.

The chum returns to Crawfish Inlet are fall stock, which further increases NSRAA's financial vulnerability if it were to fall short of the cost recovery goal so late in the season.

"If we fall short on fall stock, there is nothing more we can do," explains Scott Wagner, NSRAA General Manager. "With the current plan, if we fall short on the summer stock, we have time to decide to increase the Crawfish Inlet cost recovery, or make alternate plans."

This year's cost recovery goal is NSRAA's biggest to date: 8.2 million. While much of that represents NSRAA's growing production efforts, the total has also been dramatically impacted by the steep rise in inflation since COVID. Last year, the high salmon prices helped mitigate NSRAA's budget needs, but prices are expected to drop substantially this year.

"We saw a significant drop in the price of cost recovery bids this year," Scott says. "It was a huge drop in the value of salmon, which translates to more fish that need to be harvested to make that goal."

Unfortunately, more fish for cost recovery leaves less fish available for the fleets.

"We're struggling to keep up with inflation," Ben explains. "It's a real concern. The cost of fish has not kept up with inflation, which affects our cost-to-benefit ratio. If you consider the fishermen's taxes that are invested into these programs, the result is a lower per-dollar return on money invested."

If returns at Southeast Cove and Crawfish come in close to forecasts, NSRAA will need approximately 90 percent of the return to Southeast Cove and about two-thirds of the Crawfish Inlet return to meet its cost recovery goals.

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F/V Christina Dawn, fishing cost recovery in Southeast Cove. The last extensive cost recovery effort here occurred in 2019.

NSRAA Expands Research Program

As NSRAA's programs and production have grown, so has its need for research projects. The organization recently reorganized and expanded its Research and Evaluation department to meet the growing demand.

"In the last few years, we've taken on more research projects," says NSRAA General Manager, Scott Wagner, adding that NSRAA added a research-specific position to its staff.

There was a time when NSRAA didn't even have a research department. For a long time, Chip Blair, NSRAA's recently retired Data Analyst, was a one-man show, with the help of occasional assistants.

"We only had two fisheries (Hidden Falls and Medvejie) to manage, and it was pretty streamline in terms of data collection," explains Ben Adams, NSRAA Research and Evaluation Manager. By the time Ben took over Chip's duties, the needs of the role had changed, and it required the support

of two full-time assistants. Soon though, even that wasn't enough.

"It's grown to the point where we have a much more robust evaluation program, requiring multiple staff persons, and it's just too much to do both evaluation and research without a dedicated person for research projects," Ben says.

"I see this as a new emerging branch of our association, because we've never had much of a need for research," he says. "But the research is relevant – it's what interests the board and the public the most. A ton of work goes into producing our return estimates and survivals and values, but what piques their interest the most is the big picture and the environmental variables, so having someone take that on will be helpful moving forward."

Enter Taylor Scott, NSRAA's new Research Coordinator.

"Taylor has a really good background and understanding of NSRAA and

Sawmill Creek Works to Improve Coho Survivals

The marine survival of NSRAA’s Deep Inlet coho has declined steadily over the past five years, prompting the staff at Sawmill Creek Hatchery to take steps in an effort to reverse that trend.

“The coho’s declining marine survival coincides with when we stopped ‘family tracking’ the salmon for bacterial kidney disease,” says Hatchery Manager, Rebecca Olson.

Bacterial kidney disease (BKD) is a disease that occurs naturally in the wild, but can cause chronic mortality in a hatchery environment. Fam-

ily tracking is a method of control where the fertilized eggs from each female are kept separate, in the early stages of incubation, while the female’s kidney is tested for BKD. If the test results exceed a target threshold for the bacteria, the eggs of that female are discarded.

“We stopped BKD tracking with our coho in 2016 because it didn’t seem necessary anymore,” Rebecca explains. “We increased the broodstock coho releases at Medvejie and didn’t think we would need the Deep Inlet coho for broodstock anymore. Blue Lake, which is the water source for Sawmill Creek Hatchery, has BKD carrier fish, but we didn’t think it would affect the fish health and survival as much as we are seeing now.”

The past five years of incubation and rearing have also coincided with cooler water temperatures, and slower rearing and growth. As a result, the coho smolts have been released at smaller sizes than are ideal. The rearing survival has also been impacted by poor health from food issues, stressful moves due to the water shutdown, and more disease and bacterial loads in the water.

“We believe all of this, combined, has led to the decline in marine survival we’re seeing with these coho,” Rebecca says.

In an effort to reverse those declines, Rebecca and her staff plan to reinstate the family tracking and BKD testing for all the hatchery’s coho. In addition, the staff will install lighting for the round ponds. While the staff can’t control the water temperatures of these ponds, the additional lighting can create longer “daylight” in the fall when the water is the warmest and natural light is waning. This should help promote fish growth.

Once the hatchery’s expansion is complete (anticipated completion is 2025), the staff will have more tools to improve the size and health of its coho fry, but Rebecca is hopeful these first steps will boost marine survivals for the fish.

General Manager’s Notes



As we head into the 2023 summer salmon season, there is uncertainty on many fronts. Prices on almost all seafood products continue to drop, and salmon does not appear immune to those declines. Prices are going to be significantly lower this year than the record prices we saw in 2023. Additionally, the Chinook summer and winter troll fishery is currently not scheduled to open due to the recent Washington District court decision vacating the Incidental Take Statement of the Pacific Salmon

Treaty NMFS Biop. To add insult to injury, NSRAA is forecasting exceptionally weak Chinook and chum returns to Medvejie Hatchery, meaning that fishery broodstock closures in Bear Cove and Deep Inlet are a near certainty.

While there are reasons to be concerned, there are also several areas in which to be optimistic. This season’s forecast for a chum return of 800,000 to Hidden Falls is the largest in over a decade, due to an increase in the marine survival of the 2018 and 2019 chum fry releases. The 2018 brood year released chum fry are on track to break the 1% marine survival barrier this year with the returning 5-year-olds. This barrier has not been broken since the 2009 brood year. If the returns materialize as we predict, it will be the largest chum return to the Hidden Falls Terminal Harvest Area (THA) in a decade. Keep in mind that we have cut our Hidden Falls production by nearly half, since 2016, as we transferred production from the Hidden Falls THA to Bear Cove, at Medvejie Hatchery, and Thomas Bay.

Not only is the Hidden Falls return encouraging, our forecast for Southeast Cove is 570,000. This increase in return to Southeast Cove allowed NSRAA to shift half of its annual cost recovery away from sole reliance on the Crawfish Inlet chum returns. Since 2018, Crawfish has supported virtually 100% of our chum cost recovery harvest. Last year the Crawfish Inlet chum return fell short of projections and NSRAA was short of the cost recovery goal by \$150,000. This year our cost recovery harvest will be borne equally between Southeast Cove and Crawfish Inlet. Diversifying our cost recovery sites will minimize the likelihood we are unable to meet our annual revenue needs.

NSRAA hopes to capitalize on this increase in East Baranof chum survival by embarking on a joint cooperative agreement with the Port Armstrong Hatchery to produce up to 40 million chum salmon annually, on their behalf, out of Hidden Falls Hatchery. These additional fry will be released from Takatz Bay in the Hidden Falls THA. NSRAA has not released chum fry from Takatz Bay since 2016. The additional Hidden Falls chum releases will bring our Hidden Falls THA release numbers near to where they were in 2016, prior to moving 25 million chum to Thomas Bay and 20 million to Bear Cove. The cooperative agreement is arranged nearly identically to the arrangement NSRAA has shared with the Sitka Sound Science Center (Sheldon Jackson Hatchery) for many years, which allows NSRAA to release an additional 9 million chum fry from Deep Inlet. This arrangement will provide direct benefit to common property fisheries, provide a stable revenue source to the Port Armstrong Hatchery, and provides the best opportunity to capitalize on the increasing chum marine survivals in the Chatham Strait corridor.

Scott Wagner

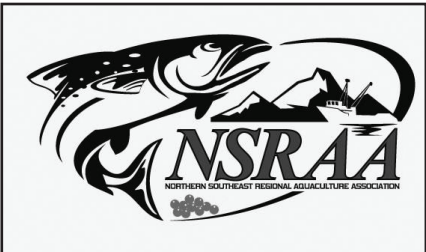
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Close up of 2-inch substrate which promotes higher incubation survivals of chum salmon fry at Medvejie hatchery.

Medvejie's Chum Trial Results Promising

Always in a quest to improve the health and growth of its salmon before release, the staff at Medvejie began a trial this winter on its chum salmon – the results of which look promising.

NSRAA typically uses 1.5-inch substrates for its egg incubators, but higher fungal growth and mortality during incubation prompted the staff at Medvejie to order 2-inch substrates (sometimes used at other facilities) to see if the larger size might make a difference during incubation. The trial included two groups of the same stock, with the only difference in incubation being the size of the substrate.

“Even in the beginning stages, there were differences in the growth between the two groups,” says Jared Nelson, Medvejie Hatchery Manager. The staff measured the size, shape and general appearance of the fish as they developed from alevins to fry. “The chum in the larger substrates had a more developed yolk sac, more developed fins, and a larger body size.”

Jared and his staff theorize the larger substrate size allows more room for the alevins to move as they grow, whereas the smaller substrates can create overcrowding conditions, which may contribute to suffocation and death, and then to fungal growth and increased mortality. The smaller substrate size may also trap gasses that affect the health of fish during incubation.

“This is really promising,” Jared says. “If you can get the fish through incubation larger and more developed, that translates to higher success in our saltwater rearing and, eventually, marine survival, once released.”

Ultimately, the larger and healthier a fish at release, the better its chances of surviving long enough to return to spawn.

Fortunately, there was not a large difference in mortality between the groups during incubation or when the fry were transferred to saltwater. The chum from the larger substrates experienced a 0.5 percent loss at release, while those from the smaller substrates experienced a 1.5 percent loss.

“It was good that we didn’t have any large mortality, but the developmental differences between the groups were encouraging,” Jared says.

The staff plans to repeat the substrate trial on the chum for the next couple of seasons, to further examine the difference and explore whether the smaller substrate size causes any trapped gasses or difference in the water.

“Moving forward, we’ll get a better idea on how the substrate size affects the growth and health of the fish and whether we want to move all the fish into the larger substrate,” Jared says.

Hidden Falls Prepares for Cooperative Chum Project

The staff at Hidden Falls is preparing to boost its chum production by 40 million this summer as NSRAA begins a cooperative agreement with Armstrong-Keta, Inc. (AKI), a salmon hatchery in Port Armstrong, on the southern tip of Baranof Island.

“AKI doesn’t have the incubation space or capacity to produce all the chum, coho and pink salmon for which they are permitted,” says NSRAA General Manager, Scott Wagner, adding that not only will the cooperative agreement allow AKI to focus its effort on its pink and coho production, but it also ensures the hatchery’s permitted chum are still produced for the fleets.

Founded in 1980, AKI was among the earlier private, non-profit aquaculture associations born out of Alaska’s aquaculture program. Unfortunately, the organization’s small size constrains its production, and due to significant debt, AKI cannot afford to take on the cost required to expand its infrastructure to produce the total salmon for which it is permitted.

“It would be very challenging for AKI to get loans for capital project to build the infrastructure to produce the fish,” Scott explains.

Rather than losing the potential production for the fleets, NSRAA is proposing to take over a portion of AKI’s chum permit capacity this summer. Ideally, NSRAA staff would collect the 40 million eggs from its returning broodstock at Hidden Falls and then release them the following spring from nearby Takatz Bay. All told, NSRAA expects the increased production would require approximately \$1 million in infrastructure upgrades.

“It’s definitely going to be a huge overhaul in our incubation,” says Kevin Connell, who just took over as Hidden Falls Hatchery Manager in May. The expanded production will require new equipment to increase the hatchery’s incubation and rearing capacity, as well as major renovations to the barge used for Takatz Bay, where the chum will be reared in net pens before they are released.

In addition to ensuring that AKI’s permitted chum production can benefit the fleets directly, the cooperative agreement also takes pressure off AKI.

“They can focus their efforts to produce all their pink salmon,” Scott explains. Pink salmon is cheaper to produce and is AKI’s main source for cost recovery. “The other benefit is it gives AKI the ability to lower its debt and reduce its financial vulnerability. It’s in nobody’s interest for the organization to close.”

The cooperative agreement between NSRAA and AKI is similar to the one between NSRAA and Sitka Sound Science Center (SSSC). Through that agreement, NSRAA produces chum in Deep Inlet under SSSC’s permit.

Under the agreement with AKI, NSRAA would take over the production of the 40 million chum for a minimum of five years, to be extended as needed.



Aerial of Hidden Falls Hatchery.

NSRAA 2023 Return Projections									
Site	Projected Return	Range		Commercial	Sport	Cost Recovery	Brood Stock	2022 Return	2022 Forecast
		Low	High						
Chum									
Hidden Falls	806,000	230,000	1,512,000	566,000	-	50,000	190,000	486,853	304,000
Medvejie/Deep Inlet*	951,000	481,000	1,618,000	828,500	-	-	122,500	2,358,922	1,814,000
Crawfish Inlet	867,000	426,000	1,926,000	See front page of NSRAA website for Cost Recovery updates			-	711,337	1,145,000
Southeast Cove	570,000	131,000	1,103,000					216,615	174,000
Gunnuk Creek	26,000	13,000	51,000	9,000	-	-	17,000	30,478	17,000
Thomas Bay	97,000	48,000	144,000	97,000	-	-	-	95,053	68,000
	3,317,000	1,329,000	6,354,000	1,500,500	-	50,000	329,500	3,899,258	3,522,000
Chinook									
Hidden Falls	400	100	600	400	-	-	-	350	500
Gunnuk Creek	400	200	900	300	100	-	-	722	400
Medvejie	13,000	6,500	19,000	7,120	780	500	4,600	11,542	20,000
Crawfish Inlet	250	100	400	235	15		-	546	620
Crescent Bay	1,800	900	2,700	1,692	108		-	807	2,700
	15,850	7,800	23,600	9,747	1,003	500	4,600	13,967	24,220
0-ck Chinook									
Medvejie	100	-	200	94	6		-	38	200
Crawfish Inlet	300	100	500	282	18		-	296	120
	400	100	700	376	24	-	-	334	320
Coho									
Hidden Falls	38,000	19,000	77,000	26,860	1,140	-	10,000	27,507	41,000
Deer Lake	44,000	22,000	88,000	22,000	3,500	18,500	-	138,358	56,000
Lake Stocking	-	-	-	-	-	-	-	4,297	1,000
Medvejie	12,000	6,000	23,000	8,040	960	-	3,000	9,074	15,000
Deep Inlet	26,000	13,000	53,000	23,920	2,080	-	-	10,805	82,000
	120,000	60,000	241,000	80,820	7,680	18,500	13,000	190,041	195,000
ALL SPECIES TOTALS:	3,453,250	1,396,900	6,619,300	1,591,443	8,707	69,000	347,100	4,103,600	3,741,540
* Cooperative Project with SJH: Projections for Medvejie/Deep Inlet are for total returns (NSRAA + SJH fish) Fish numbers needed for cost recovery in 2023 are estimates based off of average weight and price -NO COST RECOVERY IS SCHEDULED AT DEEP INLET, BUT THE THA IS EXPECTED TO CLOSE FOR BROODSTOCK DURING SW 34									

Deer Lake: Commerical Contributions Could be Underestimated

Catch analysis of coho cost recovery at Deer Lake last fall indicates the project’s contribution and survival numbers in past years have likely been underestimated.

“Last fall, I discovered there was an unusually high percent of fish with their adipose fin clipped, but no coded-wire-tag,” explains Schuyler Mace, Deer Lake Project Manager. “Over the past ten years, during cost recovery, we have seen upwards of 25 or 50 percent of our clipped fish with no wire.”

The adipose fin on a portion of Alaska hatchery-raised salmon are clipped to differentiate them from wild stock when they are caught by the fleets or return to spawn, but the coded-wire-tag or otolith-marking carries the details of the specific aquaculture association, hatchery or project from which the salmon were released, and what specific strategies were used to rear them. This tracking is crucial both as NSRAA determines the marine survivals of different brood years and strategy types, as well as its contribution to the fleets.

NSRAA has experimented with different rearing strategies for the coho overwintered at Deer Lake over the years. The coded-wire-tags indicate the rearing strategy used for each clipped fish.

The discovery of so many of Deer Lake’s coho missing their coded-wire-tags prompted Schuyler to investigate further. It’s fairly easy to identify a hatchery fish when it returns to spawn, but what about the hatchery salmon that are caught by the fleets without the wire? Any samples sent to ADF&G would not have the identifying information to indicate from which hatchery they were released and, thus, would not be included in NSRAA’s total contribution to the fleets. It could also lead NSRAA to underestimate survival rates.

Although it’s not exactly unusual for salmon to lose their coded-wire-tags, if it happens, it typically occurs within the first six weeks after tagging. NSRAA already has a protocol in place to check the fish for tags at that six-week mark. Additionally, coho at Deer Lake are administered tags according to the same methods as all other NSRAA sites, sites at which very little if any additional tag loss is recorded in the adult return. Once Schuyler made his discovery, he and the Evaluation Program staff decided to run several tests on this most recent batch of smolts being reared at Deer Lake, beyond the six weeks to see if and when the fish lost their wire tags.

Nearly all the fish (95-97 percent) from all rearing groups still held their wire six weeks after tagging in September, and again at the three month mark, but, in the spring, the net pen over winter groups were down as low as only 70-80 percent of clipped fish having coded-wire-tags.

When taken at face value, this could be evidence of poor tag injections. However, the fish which were tagged at the same time but released into the lake prior to winter have shown very little change from the initial tag checks last fall (94 percent).

Another confounding factor is that some fish naturally have missing adipose fins – which can result from nipping during rearing or fungal infection – but can be confused with the fish whose fins were clipped. Whether the fish are losing tags or losing fins, the result is the same: a fish that appears to be a hatchery fish but with no identifying information.

Staff are now working hard at identifying and testing all possible variables, but meanwhile the implications are concerning.

“Deer Lake had a pretty good return last year – about 145,000 adults,” Schuyler says. “We had about 100,000 coho return to Mist Cove and about 45,000 that went to the fleets. We estimated about 45 percent of our clipped fish without wires during cost recovery last fall. If you extrapolate that number... our actual contribution to the fleets could be double the number recorded.”

Looking forward, staff plans to trial various techniques to reduce the occurrence of the dropped wire, and will document and report the fraction of fish missing their adipose fins at release as accurately as possible. This may include trials using nutrient rich food to increase healing of the fin clip sites, tests on pen densities over winter and natural adipose fin loss, effects of tagging fish earlier in the summer if necessary, and reading otoliths from the upcoming adult return during cost recovery sampling to confirm origin of clipped fish without tags. This work will continue until Schuyler and his crew have found the best possible way to ensure that Deer Lake project contributions are accounted for as accurately and consistently as possible.



Staff checking tag retention at Deer Lake.

Sawmill Creek Expansion Nears Completion

Building construction will begin this summer at NSRAA's Sawmill Creek Hatchery, bringing the facility's expansion into its final stages.

"Ideally, we'd have everything done, and the new building up and running, in time to incubate our Chinook eggs in the new facility in August of 2025," says Adam Olson, NSRAA Operations Manager.

Sawmill Creek Hatchery was originally designed as a coho rearing facility. In 2020, NSRAA began work to expand the hatchery's capacity to increase its production, with a new focus on Chinook.

The expansion work has been funded through grants NSRAA received from the Pacific Salmon Treaty Mitigation program. The mitigation funds were created to lessen the impact on commercial fleets after Alaska's Chinook fisheries suffered additional cuts.

The expansion has been planned and budgeted in stages, in order to work within the annually awarded grants. Work completed to date includes permitting, building design, and water and infrastructure upgrades to accommodate the expanded needs of the facility.

NSRAA awarded the building contract to local Sitka contractor, McG Constructors. The company has extensive experience and expertise in large projects, and expects to have the construction of the new 15,000-square-foot building complete, including the installment of all doors and windows, by the end of November. The new facility will also include a small office and a caretaker's housing unit.

Unlike most of NSRAA's hatcheries, where the raceways and rearing ponds are outside, this facility is designed to have all raceways and rearing ponds inside, which will allow the staff to better control the daylight hours, and ambient and water temperatures. Climate control is an important tool for the zero-check program.

Chinook salmon are traditionally reared for 18 months before being

released to the ocean, making them the most costly species to produce. With the zero-check program, the Chinook are reared only for six months before release, for a substantial cost savings. But releasing the salmon at such a young age also leaves them more vulnerable once at sea, and can result in significantly lower marine survival. Hatcheries, like NSRAA, often manipulate light and temperatures in an effort to boost growth of zero-check Chinook before release. The indoor rearing ponds and raceways along with an intensive recirculating aquaculture system, will allow the staff to have greater control over the environment and potential growth of the Chinook.

Meanwhile, NSRAA has been approved for its last grant toward the project, and should be awarded those funds in July. Totaling a little more than \$5 million, the last grant will be used toward the purchase and installation of all the hatchery equipment, tanks and incubators necessary to bring the facility to fully functioning.

Originally designed as a coho rearing facility only, Sawmill Creek Hatchery has undergone several changes over its short history, including the addition of 50 million chum salmon (30 million for Crawfish Inlet and the remainder for Deep Inlet), and a portion of the permitted Chinook for which the expansion is intended. Once the expansion is completed, NSRAA will focus on coho rearing in the older facility, and Chinook – up from 300,000 to 2 million – and chum (up to 50 million) in the new facility.

"NSRAA has been working toward expanding Sawmill Creek Hatchery for more than five years," Adam says. "It is excited to know the building will soon be erected. The new facility will be, by far, NSRAA's most technologically advanced, and will be paramount in the success of our diversified Chinook production."



Construction currently underway at Sawmill Creek Hatchery.

THA Schedules - 2023

NSRAA THA SCHEDULES - 2023							
Deep Inlet	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	Seine	Gillnet	Gillnet	Gillnet	Seine	Seine	Troll
Begin: Thurs, June 1 Last: Wed, Sept 20 2023 chum forecast - 127,000 early run, 824,000 late run (both Deep Inlet and Bear Cove) Chum broodstock needed at Medveje = 22,500 summer chum and 90,000 - 110,000 fall chum (sex ratio dependant) **WILL CLOSE THA FOR BROOD STOCK STAT WEEK 34** **TROLL CLOSURE MAY BE REQUESTED IN SITKA SOUND DURING REGIONAL COHO CLOSURE** Cost Recovery: No Cost Recovery scheduled in Deep Inlet THA No Experimental Cost Recovery scheduled in Silver Bay							
Crawfish Inlet	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	Seine				Seine		
2023 chum forecast - 867,000 Begin: Late July with cost recovery; will open to seine upon completion of cost recovery. Troll: Trolling is open in West Crawfish Inlet throughout the return. Trolling may be closed in Crawfish Inlet when cost recovery boats are present and will be open on non-seine days after cost recovery is complete. Cost Recovery: Cost recovery will occur primarily at the back half of the bay unless more aggressive harvest is necessary to maintain quality. Some cost recovery may take place in West Crawfish if there is a build-up of fish at the head of the bay. West Crawfish cost recovery would occur at the direction of ADF&G.							
Hidden Falls	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	Seine				Seine		
2023 chum forecast - 806,000 Begin: Sunday, June 18, 2023 Experimental Cost Recovery as needed No 2023 Hidden Falls Assessment Tax 150,000 chum broodstock needed							
Southeast Cove	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	Seine	Troll	Gillnet	Gillnet	Seine	Troll	Troll
2023 chum forecast - 570,000 (Southeast Cove), 26,000 (Gunnuk Creek) Begin: Sunday, June 18, 2023 (Southeast Cove only) with cost recovery; will open upon completion of cost recovery End: Tuesday, August 1, 2023 - ADF&G may extend if chum salmon are still present in the area 20,000 chum broodstock needed at Gunnuk Creek Surplus will be harvested as cost recovery							
Thomas Bay	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	Seine				Seine		
2023 chum forecast - 97,000 Begin: Sunday, June 18, 2023 End: Saturday, August 5, 2023							

See NSRAA's website for THA maps, return timing, and further details.

Congratulations to our
2023 Scholarship Recipient!

Nora
Prisciandaro

Research Program, cont from front page

fisheries as a whole,” Ben says. “She’s doing a great job tackling some of these projects head-on and giving them more attention than we could have otherwise.”

A lot has changed in the past decade. Hidden Falls and projects on Chatham Strait have suffered dramatic declines in marine survival. Salmon are returning at smaller sizes and earlier age classes in larger ratios, throwing off traditional forecasting formulas and making forecasting less reliable.

Among the research projects NSRAA has recently undertaken in an attempt to gather information to increase marine survivals and better understand these new trends are the Chatham Strait predator study, a historical scale growth analysis, the Crawfish homing study, and a zero-check Chinook spawning trial.

Chatham Strait Predator Study

When returns to Hidden Falls plummeted and those poor returns were reflected elsewhere around Chatham Strait, NSRAA began to explore possible causes for the sudden drop in marine survivals. A leading theory was that predators – whales, as well as predatory fish species – had become habituated to feeding on NSRAA’s fry releases. The predator study, which uses multiple metrics, including acoustic transects, stomach content sampling and isotope analysis, examines the correlation between predator behavior and their presence at time of release with potential impacts on fry survival, began in 2021.

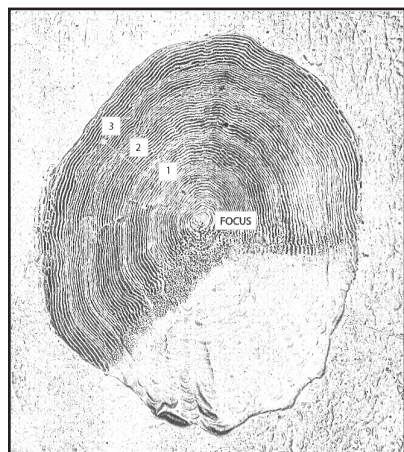
Historical Scale Project Analysis

NSRAA uses both scales and otolith marking to measure the age and growth of a fish. Scales are used to measure the age of fish when staff is processing a high number of fish in a short amount of time. Scales have circuli, similar to tree rings, that illustrate each year of growth. Last season, staff found it difficult to decipher between four- and five-year-old fish because the growth in the last year was almost imperceptible. The ages could have easily been miscalculated and skewed return data.

Fortunately, NSRAA can compare the age calculation based on the scale’s circuli with the salmon’s otolith markings, but that is much more time intensive and impossible to do during processing. However, the discovery of such minimal growth after a year at sea led NSRAA staff to wonder if perhaps salmon scales could shed a light on the age shift of salmon at return.

NSRAA has archived thousands of acetate cards recording scale circuli over the past 30 years and this project will involve digitizing the data for analysis to see if there are growth patterns or other trends that may affect salmon growth and age at return.

“The main goal with this project is to improve our forecasting,” Scott explains. “Our historic models don’t work anymore, so it could be a tool to give us more confidence as we forecast. If we can find trends that would improve our forecasting, it would help NSRAA and the fleets plan for the upcoming season.”



4-year-old chum scale circuli.



Fry beach seining, Crawfish Inlet.



Acoustic equipment at night aboard the Snap Dragon, Chatham Strait.

Crawfish Homing Study

Crawfish Inlet has been a very successful chum remote release site for NSRAA, but it has also experienced a higher than usual number of strays returning to nearby West Crawfish, and the NSRAA’s staff and board want to know why.

“We want to see what we can do to improve the homing of those fish to their release site,” Scott says. The study will examine the chums’ out-migration corridors to see if there is a correlation with their return route, and study the amino acid profiles from water samples from each area.

Recent research indicates the amino acid profile of water systems may imprint on salmon fry during the hatch and smolting phase, attracting them to those same profiles when they return to spawn.

“Maybe, when we release them, our fry naturally immigrate to West Crawfish for a few weeks before going to sea, and imprint on that stream in the process,” Scott speculates. “We’re trying to gather information. Crawfish is a critical core component of our chum projects now, but the ratio of strays is concerning to ADF&G. We want to solve that.”

Chinook Zero-check Spawning Trial

This year, NSRAA will also begin a trial on its zero-check Chinook when they return to Medvejie to spawn.

Chinook are traditionally reared for 18-months before release, making Chinook the most expensive species to raise. With the zero-check strategy, the Chinook are released to sea after only six months. It is the most cost-effective way to produce a Chinook, but only if the marine survivals make it worthwhile.

“Across the board, our zero-check programs have not been successful,” says Taylor.

The key is to maximize the growth of the Chinook fry before their release at six months. Climate control, such as manipulation of daylight hours and water temperatures, is often used to improve the growth of fish in a hatchery.

In this study, NSRAA will use a hormone on a small portion of the Chinook during spawning, to accelerate spawn time and, ideally, increase the time available for the fry to develop and grow before release.

“Once the hormone treatment happens, maturation should occur within 30 days,” Taylor explains. “We’re hoping to gain at least 30 days of rearing opportunity.”

If successful, this would allow NSRAA to have seven months, instead of six, before release, thereby increasing the chance of survival at sea.

Each of these studies could give NSRAA the necessary information to improve its forecasting and production – an exciting prospect for all – but Ben might be the most excited about the organization’s expanded research program.

“It was one of the things that had been weighing on me: that we hadn’t been as proactive as I would have liked in terms of research, looking at the bigger picture, and where we fit in within the industry and the ecosystem as a whole,” Ben says. “I think things are going to keep changing and uncertainties are going to be difficult to overcome, but being able to be proactive in this area will pay huge dividends in the long run.”

NSRAA Explores Mariculture Potential

NSRAA is partnering with the University of Alaska (Fairbanks and Southeast) for a pilot research project to study the feasibility and benefits of integrating macroalgae production at Alaska's aquaculture sites.

"We have 100 or more sites throughout the state already permitted for aquaculture production," explains Scott Wagner, NSRAA General Manager. "It makes sense you could simultaneously support mariculture production at those sites."

Last year, nearly 50 years after the State's aquaculture statute, the State of Alaska passed the mariculture statute in an effort to promote the growth of the shellfish and seaweed industry. While aquaculture associations must be private nonprofits, the mariculture statute is intended for commercial businesses.

Mariculture could be compared to ranching, but in a marine environment. Instead of raising cattle or growing hay for harvest, you would grow macroalgae or shellfish.

Macroalgae, like kelp, are both beneficial for the environment and have a growing market potential. Kelp is most common in Asian cooking, but its use is increasing worldwide. Alaska has a growing niche market for kelp salsa, pickled kelp and other kelp products, but kelp also has the potential to be used for livestock feed and, even, to make fuel.

If approved, the pilot project would study the effects, benefits and challenges of incorporating the mariculture of kelp alongside NSRAA's net pens at some of its remote sites. Preliminary research indicates the salmon could benefit from the added nutrients from the kelp, while the kelp, like trees, have a positive environmental impact by pulling carbon out of the air and water.

Kelp could also decrease phytoplankton blooms, improve water quality and provide potential refuge for newly released fish. There is also the intriguing potential that kelp's unique amino acid profiles could help improve the homing of hatchery salmon, which, if effective, could reduce the number of strays.

Possibly the biggest challenge facing the mariculture industry during this early phase of its creation is finding available sites and infrastructure. Though growing kelp requires space, it does not take much space, making a potential partnership with the aquaculture relatively efficient, so a partnership could be mutually beneficial financially, too.

It would give the mariculture a location with use of established infrastructure (such as anchors and net pens) to avoid significant overhead, while the aquaculture associations could collect a "lease fee" from the mariculture to lower capital costs.

"I see it as a win-win," Scott says. "A partnership could lower our operating costs, help the environment, and help the growth of the mariculture industry, which could be very beneficial for the communities of Alaska."

The pilot project would also explore the uses of kelp, how it could be grown for commercial production, and how to sell it.

The University of Alaska has applied for a grant from the Alaska Blue Economy Center, which, if approved, would be used in a collaborative effort with NSRAA to host a workshop, this fall or spring, to bring the aquaculture and mariculture industries together to explore possibilities and foster partnerships. "It has been successful," says Taylor Scott, Research Coordinator.



Ribbon kelp, photo courtesy of UAS Applied Fisheries Program.

NSRAA Welcomes New Board Members

NSRAA welcomes three new members to its board: Jay Hendricks, John Jensen and Hollis Jennings.

Jay Hendricks was elected to a Gillnet At-Large seat. Born and raised in Juneau, Jay started gillnetting with his dad when he was five and has been fishing ever since. He is new to fish politics.

"I've never been a big political person," Jay says. "I'm good at fishing. I don't pay attention to the politics, but obviously, that's a side of fishing that's necessary."

Jay decided to put his name in the hat for the open gillnet seat because he felt it was time to get involved, understand fish management, be a part of the decision-making process, and have a voice, if necessary. Though he's a gillnetter, Jay isn't coming to the board to advocate specifically for his gear group. "I'm for everybody catching fish," he says.

John Jensen may be new to the board, but he is not a newcomer to fish politics. He joins NSRAA with extensive experience (21 years!) on the Board of Fish, and five years on the North Pacific Fisheries Management Council.

"Before I got on the Board of Fish, I didn't really have a clue to what's involved with the management of fisheries," John explains.

The lifelong Petersburg resident has fished most of his life. John was a commercial fisherman for 45 years before changing careers to run a boat rental business 15 years ago. He's fished from the Bering Sea to the coast of California, longlined, crabbed, gillnetted, seined and trolled.

"The only thing I haven't done is trawling," he says, laughing. "I've got a deep interest in all fisheries. I consider myself an advocate for sustainable fisheries."

Hollis Jennings joins the board as a Seine representative and its sole (though not its first) female board member.

Originally from Kentucky, Hollis was travelling in Mexico when she met a seiner. After he told her he fished all summer and travelled the rest of the year, she moved to Seattle to give seining a shot. "I got my first job and fell in love with the industry," Hollis says.

Based out of the Seattle area, Hollis fishes summers in Southeast Alaska and winters off the Oregon coast. Though more women have joined the industry in the past 20 years, it was unusual to see a woman run a boat when Hollis first became captain.

"I think people thought it would be a little weird having a female captain, but it wasn't," she says. "I got help from the guys and sometimes I got yelled at by the guys, but now I've been doing it long enough, I think they see me as one of the guys."

This is her first experience with fish politics.

"Now that I'm getting older and have fished (for 20 years), it's interesting to see what's going on behind the scenes," she says. "I'm really glad I'm on the board, because I've already learned so much. NSRAA puts more fish in our hatches than anybody else. It's nice to see how they do that. They've done amazing things for us fishermen."

Like Jay and John, Hollis doesn't join the board with an agenda, simply the desire to see NSRAA stay healthy and productive, and help educate and inform the fleets when they have questions.

"It's easy to complain about things when you don't know what's going on," Hollis says. "I know I had a lot of questions before I joined the board and I've learned so much. I'd like to share that with the fleets."

Staff Profile: Ben Adams

Some of Ben Adam’s earliest memories are of jigging rockfish from the dock where his family docked its boat. As a boy, it was his favorite thing to do.

“That was my obsession: catching fish off the dock,” says Ben, NSRAA Research and Evaluation Manager, laughing. “I really don’t think I did anything else for the first 10 years of my life.”

Both Ben’s parents grew up on farms in Oregon, and when his father had the opportunity to buy a farm of his own, he decided to “take a leap and buy a fishing boat instead,” Ben says. “My dad always had this dream of coming to Alaska.”

It was a courageous move and a steep learning curve for the couple that grew up so close to the land, with little to no knowledge of boats and the sea. What followed was a series of crazy adventures, with moments Ben’s parents weren’t sure they’d live to tell the tale. Eventually, the couple made it to Sitka, where they tied up for the winter, and, like that, Sitka became home.

The boat was the family’s home for many years. When Ben was six, shortly before his brother was born, the family found themselves a home in town. Still, they spent more time on the boat and out at sea than at home. Ben was homeschooled for most of his school years until he became focused on competitive swimming.

Ben’s efforts earned him a swimming scholarship to the University of North Dakota, where he enrolled in the Fish and Wildlife program. The dramatic change in temperatures and topography of his new home took some adjustment, but Ben travelled often with the swim team and enjoyed his studies.

“The location was not the ideal place for me, but it was the right program and it worked out really well,” he says. “I didn’t love the weather, but there were a lot of wide, open spaces... a lot of room to roam, explore, hunt and fish.”

It’s also where he met the woman he would eventually marry: Emily Danielson.

Ben returned home every summer to fish, hand trolling chum to earn money for school. After graduating, Ben began work with the Sitka Sound Science Center as a field technician, which quickly transitioned into a full-time job. In 2015, Ben moved to NSRAA, as the Special Projects Coordinator, in charge of coded-wire-tagging, evaluation, special projects and scientific diving.

“What I really loved about it was it got me out to all of NSRAA’s sites,” Ben says. “I really got to see everything NSRAA does and all the people that work here, and to understand what we do as a whole. It really helped me, coming into my current role, to understand our programs and have a mental picture to go with it.”

Ben now works as Research and Evaluation Manager, head of NSRAA’s expanding research programs.

“I never thought I’d be sitting at a desk,” Ben admits. “That’s been hard, but every day is different. I think of the big picture. Working on the behalf of the fishermen is good. I grew up part of that culture, and most of my friends and neighbors are fisherman. To do something on their behalf is meaningful. The staff here is so goal-oriented. There’s a strong work ethic everywhere you go in NSRAA, and it’s nice to be part of that.”

Ben isn’t always at his desk, though. He still helps in the field, as needed, and occasionally travels to NSRAA’s remote projects.

In some ways, his life has come a full circle. Ben now helps manage the same chum returns he hand trolled during college. And there are moments, on the job, when he remembers that little boy on the dock so many years ago. It happened just recently when he was working at Hidden Falls.

“We were jigging and sampling rockfish near the hatchery, and I was thinking to myself how, as a child, that’s what I loved most, and now I get paid to do that,” Ben says.



Ben Adams with wife Emily and their dog Kona on Bear Mountain.

NSRAA FY24 Budget

Projected Income - FY24		
Year	Income Source	Amount
2022	Enhancement tax	\$2,055,000
Revenue - Fish sales / Assessment tax:		
2023	- Amount required from Chum	\$3,719,906
Cost Recovery		
2022	- Chum	\$4,000,000
2022	- Chinook	\$62,170
2022	- Coho	\$1,149,605
2022	- Incidental species	\$10,461
2022	- Roe	\$2,013
2022	- Carcass	\$185,676
Other Revenue / Funds from Reserves		
2022	Rental Income	\$34,946
2022	Investment Earnings (net of fees)	\$465,290
2022	From Unrestricted Reserves	\$0
Total		\$11,685,067
Projected Expenses - FY24		
Expense Source	Amount	
Operational Budget	\$10,679,567	
Capital Budget	\$1,005,500	
Operational & Capital Loan Payments	\$0	
Total		\$11,685,067