

Highlighting releases, returns, policy and legislation affecting the Southeast Alaska salmon fisheries**Vol. 27 No. 2
December 2009*****Strong Prices******Contribute to a******Successful Season:******NSRAA Fish Are Worth******\$11 Million Ex-Vessel******Value to the Fleet****Incubators at Hidden Falls filled
with chum eggs for next spring's fry.***Inside**

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Will Climate Change Impact Fish Survival?

All this talk of global warming may seem incongruous with the cold ocean temperatures Southeast Alaska has been experiencing the past few years. Still, scientists expect ocean temperatures to continue to rise and pH to decline in the future. While these predictions are a concern to scientists and fishermen alike, salmon may fare well enough in the new conditions.

In general, studies show the oceans warming and their acidity increasing. Scientists attribute the change to fossil fuel emissions. According to the International Geosphere-Biosphere Programme's website, www.igbp.net, "as the carbon dioxide (CO₂) emissions rise, so does the acidity of the ocean."

The oceans have absorbed about 50 percent of the CO₂ released into the atmosphere from fossil fuel emissions, states the National Oceanic and Atmospheric Administration (NOAA) on its website, www.NOAA.gov. Scientists estimate a 30 percent increase in ocean acidity since industrialization, with half of that occurring in the past 30 years alone.

Though the full impact of ocean acidification and its effects remain largely unknown, some adverse impacts have already been recorded. Those include a reduction in the shell weights of pteropods and in calcification rates for coral reefs.

According to Mike Sigler, a marine biologist with NOAA in Juneau (who, coincidentally, once worked for NSRAA), most of the studies to date have been focused on the open ocean, rather than in coastal waters. Those studies indicate that the northern Pacific would be among the first areas to see the impacts of ocean acidification simply because it has a shallower saturation depth, at approximately 200 meters, than the northern Atlantic, for example, with a saturation depth of 2,000 meters.

As Mike explains it, below the saturation depth, water is undersaturated for calcium carbonate. To illustrate, the calcium carbonate in a piece of chalk would erode below 200 meters. This is important when considering shell formation, which is easy above 200 meters, but not below.

"If the corrosive depths are 200 meters or deeper, there are some important fish near Sitka that already live in those depths," says Mike, "so the puzzle is how those animals adapted to those corrosive effects and what do they do to deal with that undersaturated water."

To date, NOAA's research in Alaska has shown ocean acidification impacts on the growth and survival of juvenile king crab, and observation based on modeling (not direct experimentation) indicates a reduction in pink salmon growth due to a decrease in pteropods.

"They (pink salmon) can switch prey and they likely would," Mike says, "but then it would come down to if there's sufficient alternative prey."

While ocean acidification may have an adverse impact on pink salmon through their prey, warmer oceans may not be such a detriment for salmon.

"I would say, for salmon in general in Alaska, warmer temperatures may not be a bad thing," says Dr. Franz Mueter, Assistant Professor of Fisheries at the University of Alaska Fairbanks at Juneau. "Because we are in the northern part of (the salmon's) range, there may not be as much of a concern over their ocean survival as for some other species."

Both Mike and Franz point to research in the Bering Sea that indicates warmer water temperatures has affected the distribution and production of some fish species, including halibut, sole, Pacific cod and pollock.

According to Franz, the Bering Sea experienced unprecedented warm temperatures from about 2001 through 2005 and many fish species were distributed further north than usual as a result.

"As things get warmer, fish move to the north," he says. "So, if we get more warming, as expected, we would expect a lot of these species to expand into the northern Bering Sea."

The main concern from those warm years, however, was not the distribution of fish but the stratification of waters.

On the Bering Sea shelf, a "very cold pool of water" forms each winter because of ice formation, Franz explains. The cold water sinks to the bottom of the shelf and a warm layer forms on the ocean's surface in the summer. The two layers are separate – like oil on water – but typically mix as storms move through the area. In those warm years, however, the layers were so strongly stratified that typical summer winds wouldn't mix the waters and, without additional nutrients from below, the surface water was stripped of nutrients. This resulted in a reduction in phytoplankton and zooplankton and, in turn, larval fish.

"What we saw in those very warm years, there were essentially very few large zooplankton on the shelf, so very little prey for the pollock and cod larvae," says Franz, adding that the lack of food likely led to a decline in the fish populations.

In contrast, the survival of sockeye, pink and chum salmon in previous warm years has actually been higher, on average, compared to cold years.

"In general, in Southeast Alaska, for the most part, warmer is better, so warmer temperatures tend to produce more salmon," Franz continues. "The disadvantage in the colder temperatures is that they may grow more slowly and not as many survive. That would be my expectation, anyway."

The lower number of fish returns and smaller fish size at NSRAA this year seem to support that theory. As Franz points out, the salmon returning this year have spent their life in colder waters and may be at a disadvantage as a result.

General Manager's Notes



With the completion of another salmon season and the end of another year, many of us in the fish business have already begun planning and speculating about the next season. Without a doubt, the 2009 season was filled with many surprises, some of which we are still seeking to understand. Why did so many fish come from the south rather than from the north as they usually did? Why were the weights of fish down so significantly? How can we explain the odd male to female sex ratios experienced at various locations? These questions, as well as many others, are what keep us seeking more knowledge about each species of salmon that contribute to our great salmon industry. Our desire to understand the elements which keep our salmon stocks healthy and productive will be what helps us all continue to enjoy and profit from our sustainable salmon resource. We at NSRAA don't claim to know all the answers, but we do pledge our best efforts at solving the unknown and continuing to produce fish in the most efficient and cost-effective way possible.

All of us here at NSRAA (staff and Board) would like to wish you and your families a happy and safe Holiday Season! See you next year.

Pete Esquiro
General Manager

Medvejie: One of the Most Challenging Years Ever

The staff at the Medvejie Hatchery continued to explore new ways to increase the size and survival of the fish it reared and released this year one of the most challenging fish culture years ever.

This year's water temperatures were among the coldest in more than a decade, contributing to extended ponding seasons and extremely slow fish growth.

Some of the techniques the Medvejie crew used to battle the difficult conditions and enhance fish growth included using an airlift pump to circulate water (increasing the water temperature and dissolved oxygen for the fish), feeding Chinook transition diets and manipulating their photo period and towing chum from Deep Inlet to Medvejie to get sufficient fish from broodstock.

Chum

The Medvejie crew released 52.2 million chum fry into Sitka Sound this spring. About 42.43 million were released at Deep Inlet, with the remainder released at Medvejie for future broodstock.

Chum rearing went well this season, though growth was slower than normal due to the cold water temperatures. The transfer from ponding to saltwater was later than normal, delaying release dates, but overall, the fish grew well with no health problems.

Adult chum returns also were later and lower than normal this year. In the end, almost 60,000 chum returned to Medvejie – significantly less than the 65,000 required for the hatchery to meet its eggtake goals and broodstock requirements of 41 million green eggs.

Crews supplemented the low chum numbers by capturing about 12,000 at Deep Inlet and using net pens to tow them back to the hatchery. The technique was successful, with only minor mortality, and those fish added approximately 13 million eggs to the total collected.

Altogether, the Medvejie crew collected 39.5 million eggs within 18 days. The hatchery will incubate approximately 63 million chum eggs, including 24 million from the Hidden Falls hatchery. Of those:

- 24 million Hidden Falls stock and 22 million Medvejie stock will go to Deep Inlet for standard rearing
- 7 million Medvejie stock will go to Deep Inlet as a joint project with Sheldon Jackson College and
- 10 million Medvejie stock will remain at Medvejie for standard rearing.

Chinook

Chinook rearing was challenging but still successful. Green Lake was still frozen in May, with water levels slightly above all-time lows, resulting in a short rearing period.

Once the ice melted, water temperatures rose almost 10 degrees Fahrenheit within a week. By mid-June, temperatures were above 50 degrees and fish growth increased about 4 percent per day, making up for the slow growth in the spring.

Medvejie's Chinook releases were smaller than normal this spring. More than 1 million traditional yearlings averaged 62.77 grams when released. The 980,631 Green Lake yearlings, weighing an average of 47.94 grams, were among the smallest released to date. The goal size for release is 65 – 70 grams.

Almost 2 million Medvejie/Deep Inlet zero-check Chinook were released at 9.37 grams. NSRAA lost 180,000 to Vibrio (a saltwater disease) in July, necessitating an early release. Next year, the staff plans to vaccinate the fish during transport to Green Lake, to allow time for them to build immunity.

Returning Chinook were slow moving up the ladder, but crews were able to collect enough eggs to meet their goals. Of the 4.8 million eggs collected, 170,000 will go to Sheldon Jackson College.

In general, the rearing this year was similar to last year, with exceptionally cold waters and delayed ponding dates. Fish culturists will continue to use transitional diets and 24-hour lights to enhance growth lost to the cold and in hopes of getting the fish to the goal weight of 50 to 60 grams by the time they are released next May.

Coho

Crews released the last of the Plotnikof Lake coho from Deep Inlet this spring. These coho were reared as broodstock for NSRAA's newest hatchery, Sawmill Cove, but problems with bacterial kidney disease and

Northern Southeast Regional Aquaculture Association

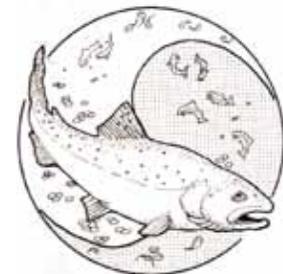
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Medveje Report continued

survival required NSRAA to change broodstock.

Site projects

Facility improvements completed this year include the installation of upwelling bubblers to the Deep Inlet aeration system and a new cover for the A-pond building, construction of a new net washing work float for Deep Inlet and the installation of a new backup generator.



Hidden Falls: Chum Eggtake Finished in Record Time

Record snowfall last winter and ensuing cold water temperatures this spring promised a challenging summer for the crew at Hidden Falls. If it weren't for the unusually warm weather this summer, the water temperatures would have been the coldest on record. Fortunately, temperatures began to rise in July and staff was able to make up for much of lost growth.

Chum

Despite the cool ocean temperatures this spring, broodyear 08 (BY08) represented another successful rearing season for Hidden Falls and Takatz. Both groups exceeded size goals for release and were released 10 days earlier than last year. NSRAA released a total of 81.8 million fry between the two projects.

This year's chum eggtakes went exceptionally well and the crew met its eggtake goals easily. It was the second earliest start (compared to the latest start last year) and the earliest finish on record. This success was made possible with sufficient broodstock, a favorable sex ratio and an outstanding crew.

This year's crew set a daily eggtake record of 10.3 million eggs, for a record daily average of 8.7 million. The entire eggtake (including 5 million for Gunnuck Creek) was completed in a record 14 days, compared to a past average of 23 days.

Chinook

More than 900,000 BY07 Chinook were released this year in early June. NSRAA staff towed the majority of the fish in pens into Chatham Strait before releasing, in an effort to minimize whale predation. Whales have become an increasing concern as they target Kasyku Bay fry releases.

Averaging just over 40 grams, the BY07 fish were released two grams heavier and two weeks earlier than last year. NSRAA crews were able to counter the cold spring water temperatures somewhat by warming the eggs during incubation and advancing their development.

The second group of Haines zero-check fry left Hidden Falls in early June at a weight of 2.62 grams – much later and smaller than desired. In response, staff updated the procedures to transfer Tahini eggs to Hidden Falls.

Instead of DIPAC transferring the eggs as eyed eggs in October, staff will now send eggs directly to Hidden Falls from Skagway. This should facilitate NSRAA meeting its size and transfer date goals.

The saltwater entry size of the BY08 fish was the largest in several

years, which wouldn't have been possible without the unusually warm temperatures this summer. There are currently 1.3 million rearing in saltwater for release next spring.

The Hidden Falls Crew collected approximately 2.1 million eggs this summer for its programs. Of those, roughly 250,000 will be used for the zero-check group and about 1.5 million for the yearling program.

Coho

NSRAA released about 2.85 million coho from Kasnyku Bay this year. A portion of the release, known as the late entry group, was towed to and released in Chatham to maximize dispersal and, hopefully, minimize whale predation. Time will tell whether this strategy is effective.

The Hidden Falls crew is rearing 2.6 million coho for release next spring. Approximately 107,000 of those are overwintering in saltwater. This is the third year of a trial program overwintering the coho in saltwater. The fish are identified with a unique tag code and NSRAA will begin to measure the effectiveness of this trial strategy next summer, when the first batch of fish return.

NSRAA collected 6 million coho eggs at Hidden Falls this year; 2.5 million will be used for the Deer Lake project and 3.5 million for Hidden Falls.

Site projects

The Hidden Falls maintenance staff kept busy this summer with numerous projects.

The biggest improvement was replacing the pneumatic operated knife-gate valves in the hydro-bypass system with pneumatic butterfly valves. The old valves were replaced three times in the past 15 years and failed several times, putting the hatchery stock at risk. The butterfly valves operate with less resistance and are more reliable and durable than the knife-gate valves.

The hatchery's aging backup generator (over 30 years old) continues to create problems. A solenoid went out this summer, but staff has not been able to locate a replacement part. The backup generator could still operate but is not dependable. NSRAA will need to replace the generator in the next fiscal year.

Staff continued housing upkeep and maintenance, completing exterior painting and beginning the installation of new windows.

The staff also replaced the Vacuum compressor building compressors and updated the hatchery alarm/monitoring system from analog to digital.



PR Concrete Floats of Powell River, B.C. is finishing construction of a new barge for Deep Inlet. The barge will provide housing and feed storage for spring rearing and is scheduled to be delivered in time for the 2010 rearing season. Clockwise from upper left: pouring the concrete deck, finishing the deck, framing, finishing the living quarters.

Market Report:

Smaller fish sizes add to an already tough year

Salmon prices were at a six-year high when the global economy collapsed last fall. A combination of carryover inventory, tightened credit, lower household incomes and – in the Southeast, at least – smaller fish size all combined to push prices down this year.

Last year's season started off well. Product was moving smoothly through the supply chain when the market collapse brought it to a sudden stop, says Craig Shoemaker, Operations Manager at Seafood Producers Coop in Sitka. "So even though we, and other producers, had already made sales and had other sales pending, those future sales never came to fruition."

The unsold product became inventory that carried over into this year, Craig explains. That, alone, would have impacted this year's prices, but the struggling economy created even more challenges.

Credit had the greatest impact on the salmon market this year, says Mike Forbush, Plant Manager at Ocean Beauty Seafoods in Excursion Inlet. As credit became tighter, developing markets such as Eastern Europe, among the biggest consumers of roe products, were unable to secure product. The resulting decrease in sales there created a surplus for the traditional market. That excess and the consumers' inability to pay for luxury items forced roe prices down.

Typically, the majority of seafood and salmon is sold to the restaurants, says Craig, but the restaurant industry was one of the industries hardest hit this year. As household incomes decreased, restaurant-goers "traded down" (fine diners customers chose casual dining and casual diners opted for fast food) and fewer people ate out.

Regionwide, salmon were approximately 20 percent smaller this year – affecting costs at the plant and in the market.

"We all work on numbers of fish, so if a plant can run 100 fish per minute and those fish are 20 percent smaller, then production costs go up," says Mike.

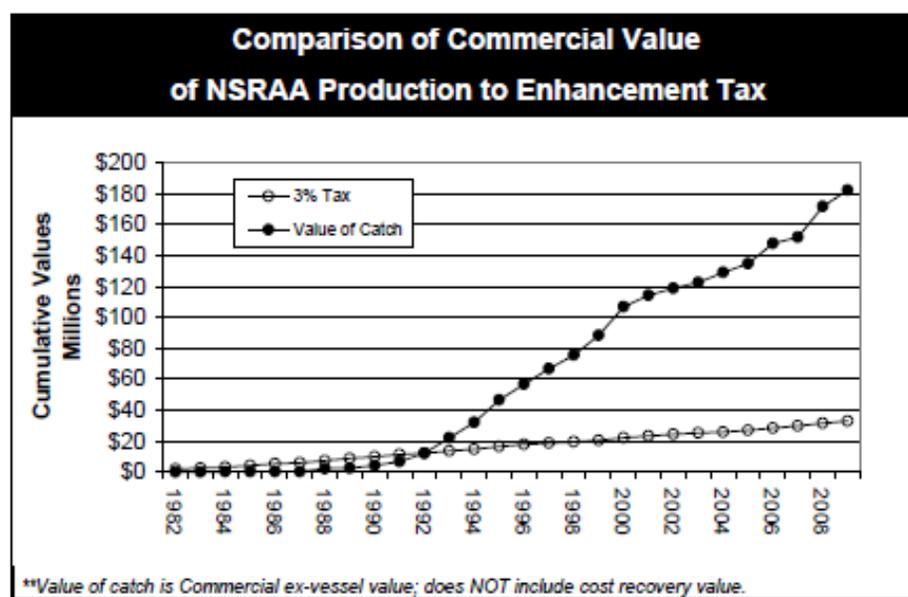
But the small fish have an even greater impact in the market, he explains. The industry has invested a lot of money developing products "that can be popped in the microwave." Those product dimensions were based on nature.

"We have experienced a huge drop in recovery just to get the thinnest part of a portion to equal 1/4 inch," Mike says. "There is a good market for trim, so the product is not going to waste, but the price difference between a salmon burger and a salmon fillet portion is huge."

In addition to the smaller fish size, Craig says he also noticed a higher percentage of #2 fish – in cohos, at least. The smaller fish were softer, with higher scale loss and more exterior wounds.

But there is a silver lining.

While prices may have suffered, those lower prices helped move the carryover inventory despite the weaker market. The collapse of Atlantic farmed salmon in the Pacific created a gap for Alaskan troll cohos to fill. And though fewer consumers were eating out, they were still buying salmon – proving the industry has succeeded in diversifying its product and marketing the meat as a staple in the American diet.



NSRAA 2009 Returns:

Abnormal patterns, smaller fish

This year's fish returns were unusual for several reasons. Not only did NSRAA staff observe abnormal patterns in the timing, direction and sex ratio of returning fish, but the majority of fish were also substantially smaller than their historic average size.

Though chum returns at Hidden Falls, Boat Harbor and Limestone Inlet exceeded this year's forecasts, the chum returns at Deep Inlet and all coho and Chinook projects reported numbers below projections.

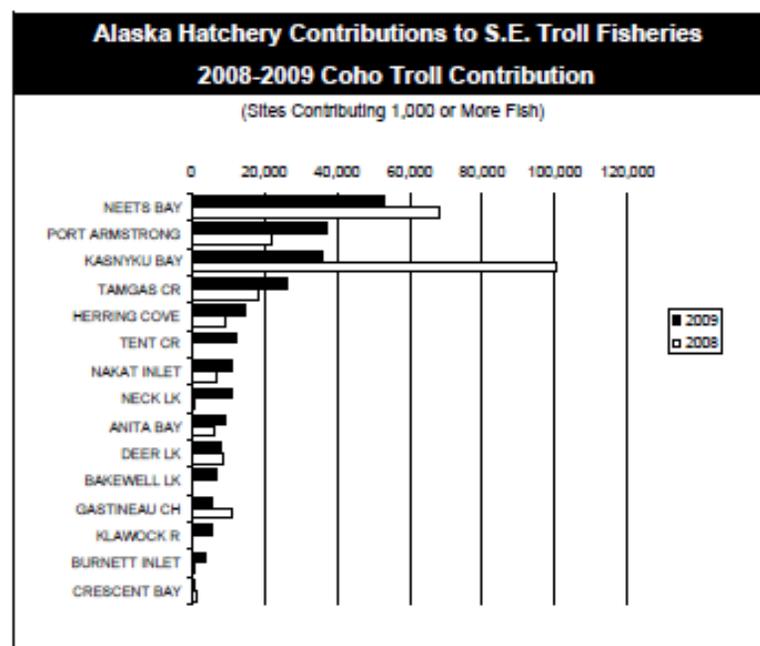
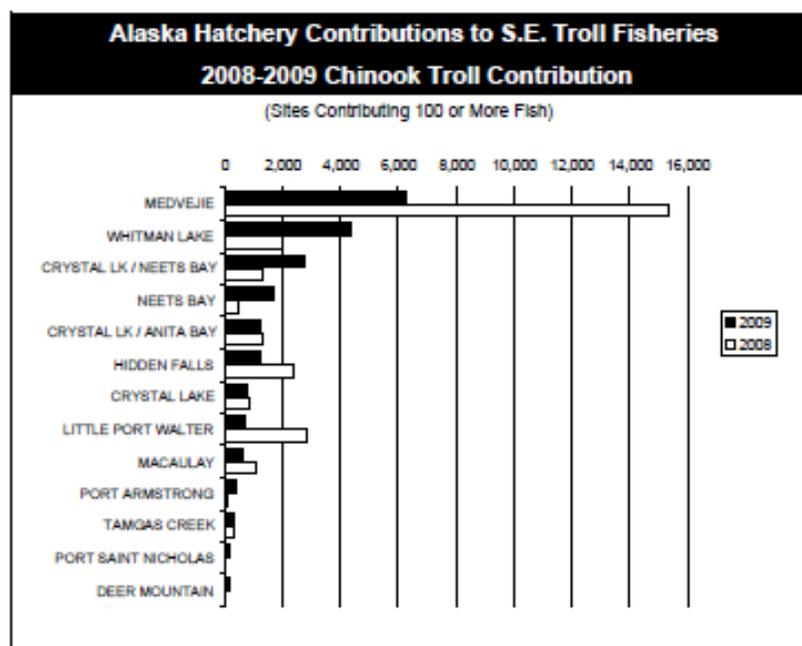
An estimated 3.5 million fish returned to NSRAA this year. Commercial fishermen caught about 79 percent of those fish, for an above-average ex-vessel value of approximately \$10.6 million. Prices remained relatively strong this year, despite the smaller fish size and lower numbers.

Chum comprised the bulk of the NSRAA catch, at about 2.7 million fish. The remainder included 26,000 Chinook and approximately 61,000 coho. While Chinook numbers came close to the 10 year average, coho totals were about half of their average.

At Deep Inlet, the lower numbers and low rainfall created difficulties with the cost recovery harvest. In addition, hatchery chum returns were weak, with too few fish returning for broodstock needs. To ensure they had sufficient fish to meet eggtake goals and cost recovery, NSRAA management was forced to close down commercial fishing. NSRAA staff collected about 15,000 brood fish from inside Deep Inlet and towed them back to the hatchery. Commercial fishing resumed at the end of August, once NSRAA met its cost recovery and broodstock goals.

The sizes of this year's returning adults were also below average. Chum, which averaged around 6.5 pounds this year, were approximately 80 percent of their normal size. Coho were about 75 percent of average, at approximately 5.5 pounds. Smaller fish have been reported throughout Southeast Alaska this year and are attributed to unfavorable ocean condi-

Cont. on next page



| NSRAA Contribution to Southeast Alaska Commercial Fisheries Number of Fish : 2008 - 2009 | | | | | | | | |
|---|---------|---------|-----------|-----------|---------|---------|-----------|-----------|
| | Gillnet | | Seine | | Troll | | All Gear | |
| | 2009 | 2008 | 2009 | 2008 | 2009 | 2008 | 2009 | 2008 |
| Chinook | 3,426 | 6,929 | 4,332 | 7,096 | 7,583 | 17,593 | 15,341 | 31,618 |
| Chum | 466,128 | 429,857 | 2,120,131 | 2,084,910 | 96,255 | 50,873 | 2,682,514 | 2,565,640 |
| Coho | 834 | 1,230 | 3,858 | 3,323 | 44,197 | 108,565 | 48,889 | 113,118 |
| Sockeye | - | - | - | - | - | - | - | - |
| All | 470,000 | 438,000 | 2,128,000 | 2,095,000 | 148,000 | 177,000 | 2,747,000 | 2,710,000 |

Returns - Cont. from prev. page

tions, including colder water temperatures.

Smaller size was not the only unusual characteristic of this year's returning fish. NSRAA also recorded unusual patterns in their timing and direction.

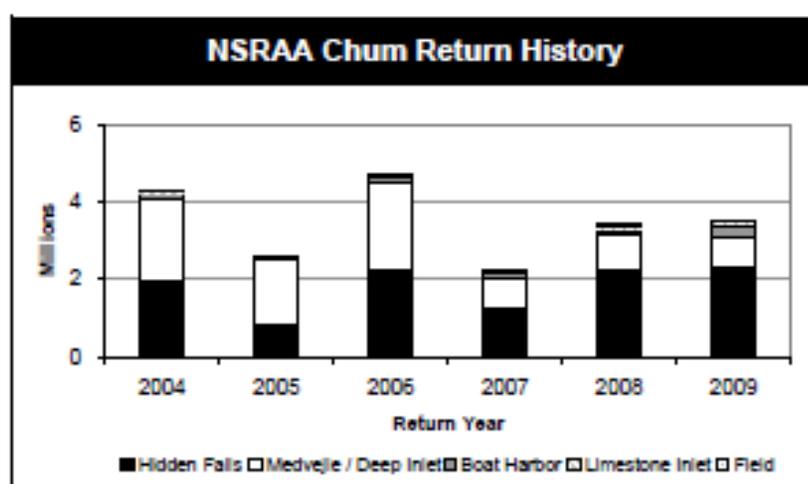
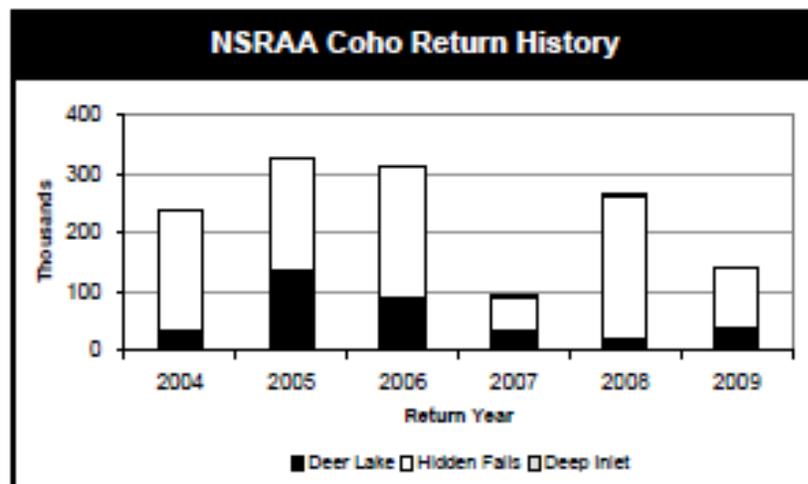
"Most of the Hidden Falls fish come through the Cross Sound – Icy Strait corridor," explained Chip Blair, NSRAA's Data Analyst. "But this year, it seemed like a lot more fish were hitting the coast well to the south and coming north up Chatham Strait (instead)."

Reports from commercial fishermen indicate this pattern included wild fish as well. Otolith sampling by Southern Southeast Aquaculture Association (SSRAA) substantiated those observations. An estimated 53,000 NSRAA chum were intercepted in Districts 101 – 108, compared to 1,200 in 2007 and 6,400 in 2008.

"It's the first time we've been able to document this pattern," explains Chip.

Also unusual was the ratio of males to females. While the ratio varies throughout the return, the final ratio is typically close to 50-50. But this year's coho were about two-thirds male, he says, adding that other hatchery operators reported similar observations.

"In the end, it seems there was a missing group of female coho," says Chip. "We never reached anything close to a 50-50 balance. It's somewhat of a mystery as to what caused this. We did have plenty of females to reach our eggtake goals though."



Employee Changes at Hidden Falls & Medveje

The change of seasons coincides with several employee changes at NSRAA.

Dan Demers joined the Hidden Falls crew in November as the new Maintenance Assistant. This is not Dan's first position with NSRAA; he worked as a fish culturist here for a couple years around 2001. Dan lived in Colorado and South Carolina before returning to NSRAA this year.

Melissa Malmstedt also joined Hidden Falls' full-time crew in November. Melissa has been working with NSRAA as a seasonal fish technician since February. She has been promoted to Fish Culturist.

Hidden Falls also welcomed Ben Smith to its crew earlier this year. Ben is the new Maintenance Supervisor at Hidden Falls. Ben was in the Navy in San Diego before moving to Sitka for a temporary position with ADF&G. His arrival coincided well with the replacement of the hatchery's alarm system, says Scott Wagner, Hatchery Manager.

"He's very skilled in the technical side of things," Scott says, adding that the crew updated the entire alarm system from analog to digital this year.

Ben lives at Hidden Falls with his wife, Christiana, and their son, Tristan.

Over at Medveje, the employee changes occurred at the beginning of the summer.

Angie Bowers, who has worked as a Freshwater Culturist at Hidden Falls for several years, was promoted to a Saltwater Culturist at Medveje, where she will assist with incubation for chums, kings, cohos and pinks.

"She's very good," says Bill Cotharp, Medveje Hatchery Manager. "She's a natural."

Angie and her boyfriend, Jamal, who are expecting their first child in January, are one of two families currently living on-site at Medveje. Their arrival was made possible when long-time NSRAA employee, Ritch Phillips, and his wife, Lucy, decided to move to town.

"We're still adjusting," says Ritch, when asked how they've enjoyed the move. "We'll probably be adjusting for quite a while."

Ritch has lived at remote hatcheries for the past 25 years. He and Lucy have lived at Medveje since 1993 – long enough to see their daughter grow from a young girl into a woman. He is wistful when he talks about their time at Medveje.

"What I miss the most is the sense of purpose," Ritch says, explaining that, as the caretaker, "you always sleep with an ear open. You have to be able to respond. Since I left, that sense of value has changed."

But, "it's good to pass the torch," he says. He and Lucy will always have fond memories of their time at Medveje.



Roger Vallion climbed a mountain to get this shot of a chum seine opening in Deep Inlet in early September.

Board Member Profile - Bob Ellis

Bob Ellis has been on NSRAA's Board of Directors for so long, he isn't sure exactly when he began. (According to NSRAA records, it was 1986.) Needless to say, Bob has been on the board longer than anyone else.

Originally from Michigan, Bob earned a Bachelors and Masters in zoology and fisheries. He dreamed of "doing fisheries research, working in streams, mostly." At the time, however, the bulk of fisheries research jobs were in salmon, so he headed west to work for the Oregon Fish Commission.

"I don't think I'd even seen a salmon until I moved to Oregon," Bob says, chuckling.

It wasn't long, though, before he was hip deep in salmon. After only a few years he moved north to Juneau – again, to work with salmon. At the Auke Bay Fisheries Lab, Bob studied the freshwater life history of juvenile sockeye salmon in the Naknek Lake system in Bristol Bay. Later, his research focused on pink salmon and associated insect fauna at Sashin Creek at Little Port Walter on southern Baranof Island.

Bob also worked as scientific editor, helping authors prepare their research for publication. He and his late wife, Natasha Calvin (a seaweed



biologist whom he met while at Auke Bay), researched and published several papers on seaweed together.

The couple moved to Sitka in 1982. It was about then Bob retired from his "regular" job. But he didn't stop working. He and Natasha began working as consultants diving on log dumps, observing and documenting the accumulation of bark and woody debris on the ocean floor.

"I'm pretty much retired now," says Bob, who celebrated his 82nd birthday in November.

But don't take that to mean he isn't busy. Bob has since remarried, to Joan Vanderwerp. His hobbies include making wine, gardening and collecting seaweed for culinary and medicinal use. He and Natasha even spent two summers living in Russia as exchange students.

Bob continues to keep abreast of new research. In addition to NSRAA, he serves on the board of the Sitka Conservation Society. In fact, it was his conservationist views and fisheries biologist background that brought him to NSRAA's conservation seat.

"My number one interest or concern is that we protect the integrity of our wild salmon stocks and the environment they depend on," Bob says.

Twenty-some years is a long time to sit on a board, but Bob says he's really enjoyed it.

"I like to be on the board where fishermen gear groups and fish processors are interacting," he says. "I've learned to have a great deal of respect for the integrity of the fishermen – as individuals and as businessmen. They are often faced with the job of representing the particular fishery they are in and protecting the integrity of NSRAA. I think they are doing a good job at that."

Bob has good things to say about NSRAA as well.

"NSRAA has done a great job of keeping up with the changes in politics and the science of hatchery fish production, while producing more and more salmon for the common property fisheries."

Deer Lake: Success Despite Record Snows & Cold

In 20 years of monitoring water temperatures at Deer Lake, this was the third consecutive of the three coldest seasons on record.

Though the season began with record snows and cold water temperatures, growth rates were still similar to the past two years, proving that pen rearing can be successful even in the most difficult conditions.

Spring set-up

The Deer Lake crew was ready to begin operations within a day of arriving at field camp. Record snows – approximately 10 feet on average – meant extra work shoveling to stay on schedule.

The crew's first priority was to install the weir used to collect emigrating smolts. Unusually low stream levels helped facilitate a speedy installation, despite the time lost to snow removal.

This year's excessive snow meant shoveling was among the daily chores until June. Despite all the snow, however, the crew was able to clear everything in time to set up on schedule.

The delivery of provisions and assemblage of the new Wavemaster pens were scheduled for the third week in April, with two days dedicated to helicopter operations. The frozen lake proved to be an advantage during pen assembly, cutting the scheduled helicopter time in half.

With provisions completed, the crew focused on constructing the Mist Cove net pen complex, installing the falls bypass pipeline and preparing the new transfer line used to move fish from the net pens to the weir.

Early season work

This year's emigration was successful, considering the cold lake conditions and late ice melt. The Deer Lake crew released 838,183 coho smolts – marking only the second time in the project history that more than 75 percent of the planted fry have emigrated as smolts.

Considering last year's cold conditions, it was expected the fish would emigrate at a smaller than optimum size. Their size was still respectable though, at an average of 114 millimeters and 13 grams. (Length and weight has ranged from a high of 134 mm and 21g, in 1990, to 95 mm and 7g, in 2000.)

This was the second year NSRAA held fingerlings in net pens over the winter and the first year with success contain-

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The crew at Deer Lake gets ready to head out into the cold to button things up for winter. 2 million coho are currently being reared at the lake.

Deer Lake - Cont. from previous page

ing them. Crew Leader, Josh Homer, credits the success to the net they added to the top of the pens this year, making them into fish-tight cages.

The addition of 1,000 feet of pipe allowed the crew to extend the transfer line from the weir to the net pen anchor site. Last year, the pipe would not reach the entire distance, requiring the crew to wait for the ice to melt enough to tow the pens closer – which is no longer an option with the new Wavemaster pens. The extended line allowed the crew to pump and release a portion of the penned fish almost three weeks earlier, despite the ice.

Fry plant

The new Wavemaster pens allowed NSRAA to increase its production at Deer Lake to more than 2 million fry for the first time since 2003. Assuming an emigration rate similar to that of this spring, Deer Lake could produce more than 1.5 million smolts next spring.

NSRAA scheduled fish transfers to Deer Lake two weeks earlier than normal. Anticipating unusually cold lake temperatures, the Hidden Falls culturists worked hard to ensure the fish were as large as possible before the transfer. But the Hidden Falls crew was working with cold temperatures as well. Despite all the culturists' efforts, the fish were transferred at an average weight of .62 grams – significantly below the anticipated 1-gram.

Their small size, however, proved beneficial for the transfer itself. NSRAA crews were able to transfer more than 2 million fry in only eight planeloads, with very little transport mortality.

Coho growth

The 2009 season opened with its share of challenges, including small fry and extremely cold lake temperatures. Fry growth rates were better than the past two years – likely thanks to the exceptionally warm weather this summer. Growth slowed again when September arrived with unusually cold, rainy weather, but fall growth rates were still slightly ahead of 2007 and 2008.

Adult return

NSRAA anticipated this year's return of 2008 smolts would be lower than the 11 percent average, considering the cold lake temperatures and their late release. The return totaled almost 51,000 fish, for a 7.6 percent marine survival. Marine survival of age 1 coho for the Deer Lake project has ranged from just over 1 percent, in 2000, to 24 percent, in 1993.



A helicopter lifts new Wavemaster pens up to Deer Lake.



The Salmon Lake weir camp has seen improvements over the past couple of seasons. An update on the project can be found on the back page.

Haines Report:

Projects went well despite a few setbacks

Overall, NSRAA's Haines projects went well this season, despite a few equipment issues.

The season's successes included excellent overwinter chum incubation survivals and achievement of eggtake goals at the Herman Creek channel and 31-mile boxes, with a total of 2.185 million chum fry that emigrated volitionally.

The transport of 250,000 Tahini River brood Chinook smolts to Lutak Inlet and their one-month rearing before release also went smoothly.

There were several equipment issues this year, however, including a water system failure at the 17-mile incubation box.

Unfortunately, none of the 152,500 eggs seeded at the 17-mile box survived when the water intake plugged up, halting the flow of water to the box. NSRAA was not able to meet its eggtake goals for this site as a result.

NSRAA has constructed several spawning channels in the Haines area to provide additional spawning habitat to Klehini and Chilkat River chum stocks.

The newest channel, just downstream and east of the original Herman Creek channel was used for the first time this year; it attracted 1,908 fish. The majority of the fish entered the channel and spawned within the first 10 days of September.

NSRAA employees installed a weirs on both channels in mid-September, to prevent over-escapement and to redirect returning fish to spawn in Herman Creek proper. NSRAA manages escapement in the channels to prevent the superimposition of redds and to maximize egg-to-fry survival.

Last year, NSRAA and the ADF&G Sportfish Division entered into an agreement to incubate, transport, rear and release 250,000 zero-check Tahini River Chinook smolts annually in Lutak Inlet, just north of Haines. This was the second year of those operations.

In late May, when NSRAA employees traveled to Haines to prepare to transfer the smolts, they found two of the five anchors missing from the net pen complex.

Otherwise, the transfer went smoothly, with 223,551 Tahini River brood Chinook zero-check fry transferred to Lutak Inlet for rearing. The fry averaged 2.62 grams at saltwater entry.

Though they arrived small, the fry grew well, averaging 11.48 grams when they were released a month later.

In September, crews found another two anchors missing. It was determined that the cotter pins which prevent the nuts on the shackles from backing off corroded away and the shackles parted. NSRAA plans to drag for the lost anchors in hopes of recovering at least one or all of them.

New Coho Broodstock for Sawmill Cove Hatchery

NSRAA completed its first eggtake this fall from what it hopes will be the coho broodstock for its newest hatchery, Sawmill Cove.

Though the facility itself is almost complete, NSRAA won't be able to use it for another few years due to a broodstock setback. NSRAA was collecting and spawning coho eggs from Plotnikof Lake stock for the new hatchery. But the rate of bacterial kidney disease (BKD) was unacceptable – as high as 75 percent – and NSRAA was forced to look for new broodstock. BKD is a disease that occurs naturally in the wild, but can be devastating in a hatchery.

In April, the Regional Planning Team approved NSRAA's request to switch its broodstock from Plotnikof to Salmon Lake, just a few miles away from Medvejie. Already, this broodstock looks more promising.

The adults from Salmon Lake are large and robust, and the average eggs per female is almost double that of the Plotnikof coho, says Lon Garrison, NSRAA Operations Manager.

This fall, employees collected the first 250,000 eggs from the new stock. About 50,000 of those will be incubated, reared and coded-wire-tagged at Medvejie, then released as smolts – beginning the new broodstock program.

NSRAA hasn't had the opportunity to develop a disease history on this stock, so there's no guarantee it won't have problems similar to the Plotnikof stock, but Lon says they are hopeful.

"We're certainly hoping and wishing and praying that the Salmon Lake broodstock won't have such a high incidence (of BKD)," Lon says. "Nobody knows why it was so high at Plotnikof Lake. It's pretty unusual."

While it's normal to eliminate a portion eggs for BKD, it's typically closer to 10 - 15 percent.

NSRAA won't use the new facility until the broodstock's first adults return to spawn in 2012. The hatchery will be an incubation and fresh water rearing facility only.

In an effort to prevent the broodstock from staying back to Sawmill Creek, crews will transport the smolts not needed for broodstock to Deep Inlet for remote release. The fish should then return to Deep Inlet, instead of Salmon Lake.

This year's eggtake was the first of three from Salmon Lake.

"By the third year, we should get enough eggs to perpetuate the program from adults returning to Medvejie Hatchery – and possibly Deep Inlet – if need be," Lon says. "By 2012, we should not need to go back to Salmon Lake."



Charlie Currit, Tommy Sheridan and Lon Garrison collecting the first wild coho eggs at Salmon Lake this fall.



A Salmon Lake coho. This stock will replace the Plotnikof stock. Fry will be reared at Sawmill Cove Hatchery.

Salmon Lake: Big rains, high waters

This was NSRAA's third year operating the Salmon Lake Weir. Initial results indicate approximately 1,500 coho salmon returned to Salmon Lake.

NSRAA is required to operate the Salmon Lake Weir as a part of its agreement with the Alaska Department of Fish & Game (ADF&G) under the Sawmill Cove Hatchery's Basic Management Plan.

The study's objective is to monitor for hatchery-produced coho and to estimate the number of wild fish returning to the lake.

NSRAA began operating the weir and a field camp at Salmon Lake in 2007. Operations run from late-June through early-November. Employees estimate the population in the lake using mark-recapture methods, which involve capturing fish at the weir, marking them with external tags and operculum punches and releasing the marked fish upstream of the weir.

These methods were developed cooperatively by NSRAA and ADF&G and are standard practice for weir counts across Southeast Alaska.

NSRAA uses mark-recapture methods in the event coho pass upstream of the weir undetected or in case the weir were to fail. NSRAA employees occasionally beach seine fish in the lake and record any unmarked coho caught in the net.

This year, the crew experienced several extreme rains, resulting in high water levels at the weir, says Tommy Sheridan, Project Leader. Fortunately, these took place when fish passage was minimal, as reflected by the low numbers of unmarked coho caught in the lake.

Any coho found with a missing adipose fin (indicating it's from a hatchery) is sacrificed. The head is sent to an ADF&G in Juneau, where it is sampled for coded-wire-tags. To date, only two tagged fish have been confirmed in Salmon Lake, says Tommy.

This season's coho escapement estimation of roughly 1,500 fish is less than seen in 2007 and 2008, though similar to annual returns recorded by the ADF&G from 2001 through 2003. In 2007, NSRAA estimated 3,111 fish returning to the lake and in 2008, the total was 2,851.

Average escapement estimated through the operation of this weir (2001- 2005, 2007 & 2008) is 2,281 coho, with a low return of 1,139 fish in 2002.

IMPORTANT MESSAGE TO PURSE SEINERS

Bids for Harvest of Cost Recovery Fish

NSRAA will not be mass mailing cost recovery contract solicitations this year. The cost of printing and mailing is not justified for the small number of proposals returned to NSRAA for consideration.

If you are interested in submitting a bid to harvest cost recovery fish at Hidden Falls or Deep Inlet/Medvejie in 2010, please contact us and we will send the bid packet and forms to you. Bid forms will be sent out to interested parties in February and due late April.

Phone: 907-747-6850 Fax: 907-747-1470

E-mail: pete_esquiro@nsraa.org

Mail: NSRAA 1308 SMC Rd., Sitka, AK 99835