ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
February 1, 2016
3:31 p.m.

MEMBERS PRESENT

Senator Cathy Giessel, Chair
Senator Mia Costello, Vice Chair
Senator John Coghill
Senator Peter Micciche
Senator Bert Stedman
Senator Bill Stoltze
Senator Bill Wielechowski

MEMBERS ABSENT

All members present

OTHER LEGISLATIVE MEMBERS PRESENT

Senator Charlie Huggins

COMMITTEE CALENDAR

OVERVIEW: SALMON GENETICS

- HEARD

OVERVIEW: FISCAL EFFECTS OF COMMERCIAL FISHING, MINING AND TOURISM

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record.

WITNESS REGISTER

JEFF GUYON, PhD., Fisheries Geneticist
Genetics Program
National Marine Fisheries Science Center (NMFS)
Auke Bay Laboratories
Juneau, Alaska
POSITION STATEMENT: Provided fish genetics presentation.

BILL TEMPLIN
Principal Fisheries Geneticist
Gene Conservation Laboratory
Division of Commercial Fisheries
Alaska Department of Fish and Game (ADF&G)
Anchorage, Alaska
POSITION STATEMENT: Provided fish genetics presentation.

BOB LOEFFLER
Institute Of Social and Economic Research (ISER)
University of Alaska
Anchorage
POSITION STATEMENT: Provided report on fiscal impacts to the state of mining, commercial fishing and tourism.

ACTION NARRATIVE

3:31:19 PM
CHAIR CATHY GIESSEL called the Senate Resources Standing Committee meeting to order at 3:31 p.m. Present at the call to order were Senators Stedman, Coghill, Costello, Wielechowski, and Chair Giessel.

Overview: Salmon Genetics

3:31:53 PM
CHAIR GIESSEL announced the overview of salmon genetics. She had actually heard part of this presentation at a Pacific States Fisheries Commission meeting last fall and she thought it would be a great topic for the Resources Committee to hear.

3:32:41 PM
SENATOR MICCICHE joined the committee.

3:33:31 PM
JEFF GUYON, PhD., Fisheries Geneticist, Genetics Program, National Marine Fisheries Science Center (NMFS), Auke Bay Laboratories, Juneau, Alaska, said his talk is centered on salmon, but they also work on other fish species including herring in Lynn Canal and in Prince William Sound. Genetics are used to distinguish closely related rock fish species and they had even worked collaboratively with scientists in Seattle to discover a new species of sand lance from Japan.

He explained that in their lab they take biological samples from the fish and digitize it by using a technique called genotyping.

The purpose is to understand where fish are caught and what their potential impacts are.

He went through some National Oceanic and Atmospheric Administration (NOAA) technical memorandum; one was data of Chum Salmon bycatch from the 2013 Bering Sea Walleye Pollock Trawl Fishery. This work is led by Chris Kondzela with Jackie Whittle and Scott Vulstek.

3:34:21 PM
SENATOR STOLTZE joined the committee.

SENATOR WIELECHOWSKI asked statistically if this is the actual number or an extrapolation based on certain ships.

MR. GUYON responded that he would be careful about what data are extrapolations and what are direct numbers. He said the Gulf of Alaska Chinook salmon by catch is an extrapolation. The other samples are direct numbers.

CHAIR GIESSEL recognized former Representative Bill Thomas in the audience.

3:35:44 PM
MR. GUYON said the chum salmon bycatch in the Bering Sea happens in a very large pollock trawl fishery that catches of 1 million tons of pollock. It's quite clean, but since it's so large, it also incidentally catches a number of other fish species including chum salmon. So, he determines where those chum salmon are from. He showed a graph of the magnitude of the chum salmon bycatch by year from 1994 to 2013. It peaked in 2007 and the sample set he would talk about is in 2013 when there was an estimated 125,000 chum salmon bycatch. Before that there was an actual count.

He said people want to know what stocks of salmon are caught in the Bering Sea and they have looked at it in different ways, both using scales and allozymes (a type of genetic marker). The scale work was done at the University of Washington and the allozyme work was at the Auke Bay lab in collaboration with Alaska Department of Fish and Game (ADF&G).

MR. GUYON said most recently they have used another genetic marker called microsatellites to determine where the fish are from.

SENATOR STOLTZE said he never heard the Pollock fishery characterized as "pretty clean with a little incidental catch." This isn't how it was characterized by the governor when he was campaigning for office.

MR. GUYON responded that the Pollock fishery is such a large fishery that bycatch numbers of both chum and Chinook salmon can be quite large also. In 2005, the chum salmon catch was 700,000 fish; in some years Chinook bycatch has exceeded 100,000 fish.

3:38:04 PM
The next chart aggregated the chum salmon samples taken from the Bering Sea back to where they came from using a genetic baseline. The dots indicated that they could be intercepted from anywhere throughout their species range. Each dot represents a collection of populations and those were aggregated into six different regional aggregations.

He said the Pollock fishery occurs throughout the year and has two different seasons: an A season and a B season. The Pollock fisheries occurring in the A season do not encounter many chum salmon incidentally. In the B season, chum salmon are incidentally harvested. The left side of the chart had a scale indicating numbers of fish (from a census done in the Bering Sea). The genetic samples were on the right side. He said a huge amount of effort - including observers, industry, ADF&G, and other - goes into collecting this particular sample set.

The next slide graphed 2013 B season Chum salmon Bering Sea bycatch. Each dot represented a vessel; one intercepted 3,200 chum salmon and that is the number of genetic samples collected. He emphasized the massive amount of human and logistic effort often working under very harsh conditions to get these samples to one lab for analysis.

The stock composition analysis in 2013 showed that 15 percent of the fish were caught from Southeast Asia stocks; 45 percent of the sample came from Northeast Asia (Russia). This shows that about 60 percent of the chum salmon that were encountered in 2013 were derived from Asian stocks. Forty percent were derived from North American stocks.

As geneticists, Mr. Guyon said, they take the proportions and extrapolate them based on the size of the bycatch. So, in 2013, the size of the bycatch was 126,000 fish and those proportions can be multiplied to get more estimates. For example, about

24,000 fish were estimated to be intercepted from Western Alaska in 2013.

SENATOR STOLTZE asked what the department does with that information, because the state has policies that promote the coastal communities' involvement in the Community Development quota Program (CDQs) in these larger operations. Those same coastal communities, maybe not the same participants, spend research money and attention on those chum and King salmon deficiencies. He asked how this scientific information is used to make political decisions on what is good for the Western Alaska communities.

MR. GUYON said they work the data through the North Pacific Fisheries Management Council (NPFMC) process, which has led to Amendments 91, 93, and 97 that have gone into the different fishery management plans.

3:42:57 PM
SENATOR STOLTZE asked how his data gets to decisions made in-state for Alaskan interests. For instance, there is a bill that will enhance the ease of loans for large vessels for ground fisheries. At the same time the state is investing large amounts of money in trying to re-propagate and research chum and King salmon.

3:43:50 PM
MR. GUYON answered that data he produces goes through the Council process that works very closely with ADF&G. He would highlight some of the connections and synergies they have with the state along the way.

SENATOR MICCICHE asked if the mean is 165,000 fish and asked him they can encourage more of the 24,000 number in 2012.

MR. GUYON said the median may have been a better statistic, because it was driven in large part by the 700,000 number in 2005. Bycatch was pretty stable over a number of years, but that 165,000 number did cause a lot of concerns. As a geneticist he tries to develop the genetics program so that it levels out bycatch throughout the entire process.

SENATOR MICCICHE asked if Chinook/coho salmon bycatch distribution is similar to the chum. Were they heavy years for bycatch or heavy years for a specific species?

3:46:40 PM

MR. GUYON answered that the heavy year for chum salmon was in 2005 and the heavy year for Chinook was in 2007. He said they do stock compositions based on time and area strata within the Bering Sea to better understand where particular stocks of fish are so that might help potential management actions. This is difficult to do, because they are doing stock composition on fish they are trying not to catch.

He highlighted a project with the ADF&G, the University of Alaska, and the Western Alaska Salmon Coalition that tried to further differentiate chum salmon in Western Alaska which are quite homogenous and difficult to separate, to understand impacts to the Yukon-Kuskokwim and other rivers in Western Alaska.

SENATOR WIELECHOWSKI asked him to put the number of salmon in peak years (500,000 or 600,000 fish) into some sort of perspective. He asked if they can actually trace the genetics to particular streams. In terms of global bycatch for chum salmon, does he have any sense of how much chum salmon are being caught globally on a yearly basis?

MR. GUYON answered the first question: they don't take an individual fish and allocate it to an individual stream. The aggregations becomes more accurate the larger the aggregations are, because they are genetically more similar. So, they have been partitioned to the six large groupings rather than an individual stream.

With regard to the total number of chum salmon around the world, one of their statistics, working with the North Pacific Anadromous Fish Commission, is hatchery releases that are associated with chum salmon. Those releases are in the billions. He didn't know what the returns are. For both the Chinook and chum, which are the two salmon species that are intercepted, the council has done both economic and biologic analyses to understand the impacts to Western Alaska. He could get the council links to those particular sites as he provided data to them.

3:49:17 PM
MR. GUYON pointed out a link to the Chinook salmon bycatch data from 2014 Bering Sea Walleye Pollock Trawl fishery to download the report. This report was led by Chuck Guthrie and Hanhvan Nguyen. The next slide represented the Pollock fishery in the Bering Sea that intercepts chum and Chinook salmon. It graphed the Chinook salmon bycatch from 1992 to 2014. The A season is

the spring season and the B season is the fall season for catching Pollock. These statistics were provided through the National Marine Fishery Service Regional Office in Juneau. Work was done using scale pattern analysis and genetic analysis by the University of Washington, the ADF&G and the NMFS He wanted to understand the impacted stocks. Between all the different techniques and organizations the stock compositions are generally in very good agreement, he said.

The baseline used for Chinook salmon is a SNIP baseline, a type of genetic marker, and each dot represents an individual population that have been genotyped and then aggregated based on their genetic similarities. They have been aggregated into 11 different stock groupings.

Like with chum salmon, the next slide graphed the different weeks of the Chinook salmon Bering Sea bycatch throughout the 2014 fishery with dots representing genetic samples that were collected. Again he said this represents a massive amount of work from a large number of people. He also cautioned that data for seven years was collected differently from one year to the next. The graph shows about 50 percent of the samples were derived from coastal Western Alaska in 2014. These particular groupings represent river systems that flow into the Bering Sea. So, the largest proportion of fish that are being caught in the Bering Sea are from river systems that flow into the Bering Sea. Stocks from throughout the species range are intercepted in this particular fishery.

This is different than the genetic analysis led by the same two people of the Chinook salmon bycatch in the 2014 Gulf of Alaska Trawl fishery that just came out a few weeks ago. It has a small but considerable Pollock fishery, rock fish and Arrowtooth flounder trawl fisheries that also intercept Chinook salmon as bycatch. Again he determined where they are from.

SENATOR STOLTZE asked if an acceptable amount of bycatch is sustainable, although Alaska doesn't have any decision making ability on it. How could Alaskan interests be manifested?

3:54:36 PM
MR. GUYON answered that as geneticists they provide information which goes through a council process, which goes through and identifies using economic and biological modeling to assess the potential impacts that helps with ruling making activity.

SENATOR COGHILL asked if there is an overlay of Yukon River chum and Chinook bycatch.

MR. GUYON said he would show one of the differences between them in a previous graph.

3:57:35 PM
He went back to chart of the Chinook salmon that were intercepted in the Bering Sea during the A and B seasons of the Pollock fishery. Chinook salmon was intercepted in both seasons. Chum salmon were not intercepted in the A season, but they were intercepted in the B season.

SENATOR COGHILL said his point is that on the Lower Yukon when it was time to catch fish, the Kings were forbidden except for catch and release, and it was exceedingly difficult. For them to run so differently in the bycatch time means to him that something is happening at the near coast.

Mr. Guyon explained that for the Pollock fishery in the Gulf of Alaska the bycatch was estimated with help from the ADF&G and University of Washington and other was work done by the NMFS. The data they get from both different types of analysis are very similar, which is good. He explained that in the Gulf of Alaska, collecting samples and estimating bycatch is done differently. This is because observers are deployed differently than in the Bering Sea, where the vessels are larger and there is more room to put the samples. In the Gulf, the vessels are smaller and so it's more difficult to put people on them. Therefore, genetic samples are taken from a systematic random sampling from particular cruises. From these samples a weighted estimate (by time and space) is produced for the entire catch.

3:59:25 PM
SENATOR MICCICHE asked if one could assume that the reason the other three species of Pacific salmon are not a bycatch problem is because they aren't there while the Pollock fisheries are happening, or is there some other reason.

MR. GUYON answered that is not his area of expertise, but it may have something to do with how the fish are intercepted. Are the salmon interacting with the Pollock? Are the salmon above the Pollock and being intercepted by the net as the net is going down or coming up? There may be differences in life strategies between the different fish of where they are being intercepted, especially at the distance they are from the shore.

4:00:42 PM
He continued that in the Gulf of Alaska it's generally a Chinook salmon bycatch issue. Not many chum salmon are intercepted there, although his last report contains a sample set of chum salmon from the Gulf. Using weighted techniques, which are developed in coordination with Bill Templin's group at ADF&G, he graphed the stock compositions in the Gulf of Alaska for the various years. Again he cautioned that samples were collected differently. Anyhow, he said the salmon that are encountered in the Gulf are different than the ones encountered in the Bering Sea.

The last two slides were of other trawl fisheries in the Gulf including a rockfish trawl fishery. An area off of Kodiak is part of that fishery, and industry voluntarily collected samples and sent them to the Auke Bay lab for analysis. Based on these census they produced a stock composition, which is suggestive of fish from the West Coast of the United State, British Columbia and the Gulf of Alaska flowing stock.

4:02:22 PM
Likewise, there is also an Arrowtooth flounder trawl fishery for which industry volunteered to collect samples. In 2014 it was the majority of fish that were sampled and sent to the lab. It had the same type of result and the map showed where the fisheries are occurring.

The last slide was an acknowledgement of all the people he works with, the North Pacific Groundfish and Halibut Observer Program that provides amazing sample sets, the people in ADF&G, and two groups that provided rock fish and Arrowtooth flounder samples. The genetic part is funded by the NMPFS, the Alaska Sustainable Salmon Fund, and a non-federal match by the North Pacific Fisheries Research Foundation, an industry group.

CHAIR GIESSEL thanked him and invited Mr. Templin to give his presentation.

4:04:05 PM
BILL TEMPLIN, Principal Fisheries Geneticist, Gene Conservation Laboratory, Division of Commercial Fisheries, Alaska Department of Fish and Game (ADF&G), Anchorage, Alaska, said he often receives the question, why does ADF&G have a genetics lab. It's mainly because their job is to help the department achieve its mission, which is to protect, maintain, improve and manage the fish and game and aquatic plant resources of the state. This is done so that they can develop in the best interest of the

economy and the wellbeing of the people of the state. They have to figure out how to balance things like protecting and maintaining with improving and managing. Genetics technology can be used to address information needs as well as to make decisions on things like hatchery permitting and human uses.

The lab's services generally fall into four categories: understanding the resource, developing the capabilities for management using rapidly increasing technology available through genetics. They also use the information they gain to help assess genetic risk (one of their main responsibilities in a permitting setting), and they use this information to inform and assess management actions. So, after the fact or in-season they can use information provided through genetics to actually manage the resource.

Some questions they receive are:
Did exposure to oil cause genetic injury? - this is in reference to the effects of the oil spill in Prince William Sound. What species of salmon is this? - this is in reference to receiving samples from putative Atlantic salmon captured in Alaska waters. Is this crab a hybrid? Which brood stock are these hatchery salmon from? What is the genetic structure of these populations? - this is in reference to developing new information on coho salmon in Cook Inlet. Where are the fish going? - Chinook salmon in the Yukon River is a good example, as fish pass the Pilot Station test fishery. They get samples and run them in-season, which allows them to estimate the Canadian component to get a sense of what how to meet treaty needs. Finally, more locally, whose fish are being harvested? An example would be the Chinook salmon harvested in Southeast Alaska under the Pacific Salmon Treaty.

4:08:45 PM
He gave four examples:
Red king crab are an important resource for the State of Alaska. They occur throughout the North Pacific and the Bering Sea; a good portion extends over Southeast Alaska. In order to provide information for management of this resource, they took samples from populations across the state from Southeast and into Bristol Bay near the Pribiloffs, in Norton Sound and the Aleutians, as well as from the Okhotsk Sea.

CHAIR GIESSEL recognized Senator Huggins in the audience.

4:09:53 PM

He said a way of looking at genetic relationships is by using a map of genetic space rather than geography. The closer any two (population) points are the more similar they are and the further apart they are the more distinct they are genetically. The map inset from Southeast Alaska had red dots very close together, but genetically there was some distance among them. One of the blue dots came from the Aleutians, one from Norton Sound and one from Russia.

He pointed out that a red dot in the upper left hand corner was from Seymour Canal. So, the largest distinctions among red King crab populations in this data set come from the smallest area of collection within Southeast Alaska. Looking across the range of the species, each dot indicates a population and its measure of genetic diversity. So, basically one sees a trend moving from west to east that is decreasing in genetic diversity within populations.

MR. TEMPLIN said the implications of the study are:
1. The understanding of the historical contingencies that led to this population structure, which also helps them understand what might happen in the future, especially in changing climates and landscapes, and human activities.

2. It lets them know that the red King crab might in some areas be managed on a much smaller geographic area and in other areas in a much larger geographic area.

3. It provides information on human activities. An on-going program looks at hatchery supplementation of red King crab stocks. So, this information can be used to guide permitting decisions.

4. It allows development of capabilities. Without the baseline for Chinook salmon in the North Pacific that Dr. Guyon spoke about none of that work that he showed would be possible; likewise none of the smaller amounts of work in Cook Inlet or Copper River or on the Yukon, or elsewhere, would be possible. So, the effort to put together this large coast-wide baseline developed capabilities for the state and for many other agencies - including international groups.

In order to do this, Mr. Templin said they had to work with international colleagues through the North Pacific Anadromous Fish Commission to get samples from throughout the range. They also worked with colleagues in the Pacific Salmon Commission arena up and down the West Coast and in British Columbia, which

provides information and samples from the eastern side of the species range.

MR. TEMPLIN showed a map of all 172 populations put together colored by regional grouping. If this is all thrown together into a "tree" each dot corresponds to a place on the map. This difference between populations is measured using different branches. The map indicates that populations from some areas group together and in other areas populations are far apart. He pointed out that Western Alaska, Norton Sound down to Bristol Bay are genetically very similar to each other but geographically very disparate. It's the same on the Yukon River, and this is the kind of information they use for meeting treaty needs on the Yukon River.

4:14:50 PM
It also helps them integrate with federal marine studies where juvenile salmon are captured. This information is used to get a sense of where juvenile salmon leaving these rivers are going and combining that with ecological studies to get a sense of what the survivals will be in the next four or five years.

SENATOR MICCICHE said the river system distribution in Northwest Western Alaska where the yellow boxes congregate and Southeast Alaska have a similar coast distance, but they seem to be all over the place. He asked what he attributes that to.

MR. TEMPLIN answered that there are a couple of theories out there. One has to do the fact that most of the area was covered with glaciers and there could be no salmon. The recolonization of rivers over time, whether they came from the south or the west coupled with the amount of time the area had been open, contributed to a lot of geographic variability, and glaciers affected some areas more than others. In Southeast Alaska, he surmised, they are seeing the effect of colonization, recently receding glaciers and the expansion from populations down south, which have a much larger reserve of genetic diversity during the glacial maximum than the group out to the west in the Bering Sea and Russia areas.

4:17:08 PM
Using that information in combination with federal studies and international colleagues - Russians and Japanese high seas programs through the North Pacific Anadromous Fish Commission - the stock compositions are boiled down (on the right) and that gives them a sense of Chinook salmon movements during time and across seasons in the Gulf of Alaska and Bering Sea.

4:17:48 PM
MR. TEMPLIN addressed managing hatcheries and said there are five populations, but over time they come to equilibrium (slides 17-32 show cartoons of genetic risk assessment variables). Samples are taken from one of these populations and are reproduced in a hatchery and these are released for harvest. But over time, if the fish are constantly going back into the hatchery, there is a different selection pressure and the expectation is that the fish become domesticated over time. However, if the hatchery fish stray into other populations, those populations become more and more like the hatchery fish.

He said it would be so much better if they had some information, so they went to Prince William Sound (PWS) and got chum DNA samples for the population prior to the hatchery and samples from today. They looked for a change in that population across time to see whether that hatchery had an effect.

SENATOR STOLTZE asked if "wild" is a scientific term, since it is used widely as a marketing term, and what the differentiation is between a hatchery fish that is out there on its own versus a "wild" fish.

MR. TEMPLIN said a lot of people ask that. Generally, in a situation where the fish have come from a natural system but may have had hatchery influence they use the term "natural." In a place where there has been no hatchery influence they might call them "wild." There are no hard and fast rules.

MR. TEMPLIN went on to explain that the effects they have measured from this program in Prince William Sound study show that the natural populations in streams have not changed appreciably by being in the presence of the hatchery. Whether you call them "wild" or "natural" is a decision that hasn't been made yet. They are called "wild" under the state's Hatchery Wild Program, a large scale study of the pink and chum salmon hatcheries in Prince William Sound and the chum salmon hatcheries in Southeast Alaska.

4:23:09 PM
SENATOR MICCICHE asked why then do fish stray if strict controls are used.

MR. TEMPLIN answered that there are several answers for that. One is that straying is a fundamental life history strategy for salmon. They return generally to the place where they were

spawned; it provides an advantage to those fish that return because it was at least good enough when they were born to provide for their children. But straying is also a fundamental opportunistic life history where a fish takes the bet that maybe he will find a place that has less competition or is better in some way. There is no controlling fish returning to these streams - no weirs of fish gates - so they rely upon the biology of the species, in general, to return to where it was born.

Then through genetics policy, some hatcheries are sited away from other salmon streams of similar species, like in Southeast Alaska where Chinook salmon hatcheries are sited away from the sensitive areas where natural production occurs. In places like PWS or Cook Inlet an integrated system is used whereby hatcheries are sited right next to the stream where stock originally came from to reduce the effect of straying.

SENATOR MICCICHE asked if the straying incidents of an imprinted outgoing smolt from a river system is higher with hatchery fish than with the natural population, because the diagram seems to suggest that.

MR. TEMPLIN answered yes, but they don't have natural stray rate information right now, because it would be hard to control and expensive to do. However, the stray rate from a hatchery can be measured, because all hatchery fish in PWS are marked with an otolith (ear bone) mark. It is however, too expensive to conduct this analysis stream by stream.

SENATOR STOLTZE asked if any area of the state is lacking in genetic information - if he could pick a weak spot of state management.

MR. TEMPLIN answered that is difficult, because there are places where they don't have information, but those places don't necessarily have a management need. As management needs arise or as the importance of an issue arises they begin to put a study in place, much like in Cook Inlet over the last three years. Up until 2012 there wasn't a real driving need to spend money and resources on developing coho salmon capabilities there, but since then they have devoted a lot of time and effort and made a lot of progress towards developing the baselines and doing the application to fisheries.

SENATOR STOLTZE remarked that the driving need came from the Mat-Su Valley delegation and Southcentral folks; it didn't come from other areas of the state or the department.

4:28:45 PM
MR. TEMPLIN continued that study implied that the population structure PWS chum salmon populations has not visibly eroded. However, an introgression (insertion of hatchery genes into the wild population gene pools) was measured indicating that both distance from the hatchery and life history can affect that introgression rate.

He pointed out that the West Salmon Stock Identification Program (WSSIP) is a large program funded by the state that rose out Area M interception fisheries, which affect a large group of people in Western Alaska. The idea was that genetics might be able to help out with resolving this issue. Senator Ted Stevens said he would provide his political support to fund a large scale collaborative genetic stock identification study if all the stakeholders could get together on the necessary information, the study design, and the results, so that they were all working together whether or not they agreed on the answers. And a large group of people and organizations did join including Native associations, fishing associations, and local municipalities. While there is still a lot of interpretation on what the results mean there has been no argument on the science because everyone was involved and agreed to the numbers.

For a sense of scale, this study encompassed 3300 kilometers of coastline, the equivalent of either the west or the east coast of the United States. It involved large numbers of fish: 74,000 individual chum salmon and 82,000 sockeye in a year and a half, where previously the samples were around 5,000. It answered questions like what stocks are caught in the fishery, how many fish were caught, or what fishery catches my stock.

The flag ship is the Port Moller test fishery, which occurs in-season and provides real-time information that is useful to managers, fishermen and to processors. The information is turned around very quickly prior to fish actually arriving in the districts. It answers questions like what stocks are coming through or are there still a lot of Kvichak fish coming in. This information gets picked up in the trades that publish up-to-date information on fish movements. Thanks to the Port Moller Test Fishery, the processors and boats were able to get to the waters in time. Otherwise, they would have missed the massive late run that arrive significantly later than the 10 year run average.

SENATOR WIELECHOWSKI asked if all that information in the charts is on-line somewhere.

MR. TEMPLIN answered yes. It's in the form of a news release that goes out to the public every four days or so and it is on the ADF&G's Commercial Fish Division website.

SENATOR STEDMAN commented that he heard Mr. Templin say that red crab in Seymour Canal is genetically different from those in Stevens Passage and other areas and asked where else in Southeast they sampled.

MR. TEMPLIN said he didn't have the full list, but he knew they went to Barlow Cove and Seymour Canal - mostly northern Southeast Alaska.

SENATOR STEDMAN asked him to get the information on where they went in southern Southeast.

MR. TEMPLIN answered that he would get that for him.

Overview: Fiscal Effects of Commercial Fishing, Mining and Tourism

4:37:31 PM
CHAIR GIESSEL said she invited Bob Loeffler from the Institute of Social and Economic Research to present a report that he and Steve Colt recently completed on the Fiscal Impacts of Commercial Fishing, Mining and Tourism in Alaska, to put some of the fiscal challenges they face into context.

4:37:38 PM
BOB LOEFFLER, Institute Of Social and Economic Research (ISER), University of Alaska, Anchorage, said this is an updated report that was done by the Department of Commerce, Community and Economic Development (DCCED) about 10 years ago that was called "The Net Benefits Study." He emphasized that they are not talking about the net benefits to the state; they are talking about something smaller: what the state spends versus what it gets in revenues.

4:38:44 PM
He acknowledged his co-author Steve Colt, a University of Alaska Anchorage (UAA) Professor of Economics. He said his position at ISER is funded by a grant from the Council of Alaska Producers. The conclusions are his and Mr. Colt's.

The fiscal benefits in this report relate solely to revenues to the state versus expenditures to manage or promote an industry.

It does not include those broader things that everyone cares about like jobs, income, and local businesses.

He started with commercial fishing, which gives about $50 million to local communities. The state receives roughly $70 million. Overall the commercial fishing industry gives more money than the state expends and about the same amount goes to the local communities as revenue sharing. It's an important foundation of local community fiscal stability. But if the state's operating costs for commercial fishing in FY 2014 are added in, the state spends about $8 million more than it receives in revenue. If the capital budget is factored in, the gap is about $27 million less. For some caveats, the researchers took the FY 2014 operating budget. Revenues were averaged over five years, while capital budget for commercial fishing were averaged over three years.

SENATOR STOLTZE asked how much is available in unrestricted general fund (GF) revenue that is available for roads, schools that is not already obligated in the budget.

MR. LOEFFLER answered that the 53 percent of that $70 million the state gets from the commercial fishing industry is "true taxes," which are what the legislature can use for any purpose whatsoever. The fees used for agency management is what the legislature dedicates back to that agency. The last third is what he called "pass-through taxes" where the commercial fishing industry decides on its own to levy a fee for a specific purpose, like in PWS, they might support a hatchery or a marketing effort. Then the legislature collects that money and allocates it back to that purpose, often through the capital budget, but sometimes through the operating budget.

SENATOR STOLTZE said the Revenue Source Book from the Department of Revenue shows that the fisheries business and the fisheries resource landings amounted to $26.4 million two fiscal years ago and last year it was $24.8 million.

MR. LOEFFLER responded that in 2014, using the average of five years the state received about $28 million from those two taxes and passed an equivalent amount to local governments. He said the industry pays 15 separate taxes in his three-part chart.

SENATOR STOLTZE said when people think about revenues they think about funding that is all available for roads and schools, but this doesn't apply to that.

MR. LOEFFLER added that other than the pass through revenue, about two-thirds of the $70 million go for those things.

He said the next question is where the $78 million from the fishing industry gets spent in the operating budget. About two-thirds of it goes to ADF&G and some for marketing in the DCCED and about 10 percent goes to enforcement for DPS.

The capital budget, for which they took a three-year average and found 51 projects related to commercial fishing which added up to about $20 million a year.

SENATOR MICCICHE noted how studies in general have limited value, but he appreciates the effort. He asked how he accounted for sport fishing opportunities in the study.

4:46:17 PM
MR. LOEFFLER answered that the Division of Commercial Fisheries also manages subsistence, but he asked them how much of the GF goes to subsistence. He then subtracted that from the GF amount. In general they looked at GF revenues and expenditures only, (no federal funds or special funds), and if there was something special that was unrelated to the commercial fishery, they tried to divide it off. They took about two-thirds of the total budget and allocated it towards commercial fishing. They tried not to count things that didn't go towards the commercial fishing industry. They probably overestimated genetic data analysis which is used for a variety of things.

SENATOR MICCICHE said he believes that every industry should pay its own way and be a net benefit to the state, and he wanted to make sure he understood the full benefits of these industries, and calculate how they should be taxed in a way that helps them pay their own way.

MR. LOEFFLER said he was trying not to make any recommendations on how to tax industries and he knows he didn't account for many of the benefits of the commercial fishing industry that go to local communities. He made it very clear those elements were not in his scope.

SENATOR WIELECHOWSKI asked if he had the revenue figures for what each industry - commercial fishing, mining and tourism - generates.

MR. LOEFFLER answered that elsewhere in the study he has the total ex-vessel value but not the profit, because that

information is proprietary. The graph shows how ex-vessel value changes. He said conclusions from one portion of the industry, like the Upper Yukon, are not necessarily true for other areas, like Bristol Bay, and revenues change dramatically with run strength and prices. This is why they used a five-year average.

Finally, he said commercial fishing is not managed the same way oil is. The purpose for managing fisheries is not to maximize revenue for the state; it's for a lot of other things, as well. The fiscal impact of commercial fishing is probably slightly less than the state operating cost, a little less if you include the capital budget, which he assumed would be smaller in the future, but it provides a lot of revenue to local governments.

CHAIR GIESSEL said the full report is on the ISER website.

SENATOR STEDMAN pointed out between the oil and the fish that one is finite and one is not.

MR. LOEFFLER went on to the mining industry for which he did the same analysis. Mining brings in revenues to the state of a little less than $100 million, but the cost to manage it is a lot less than for commercial fishing, (in FY14 about $10 million). Mining brings in 6 to 8 times what is spent and it adds another $22 million to local government. Unlike fishing and to some extent tourism, which is broadly spread throughout the state, large mines fund most of their local governments. There are only six large scale active mines in Alaska. The Red Dog is the only taxpayer in the Northwest Arctic Borough; Greens Creek and Kensington are the two largest taxpayers in Juneau; and Fort Knox is the largest taxpayer except the pipeline in Fairbanks and Usibelli provides money to the Denali Borough.

With respect to revenue, about 40 percent comes from mining license taxes, about one-third from the corporate income tax and about 20 percent (rents and royalties) from the three mines that are on state land. With respect to cost, most of that comes through the Department of Natural Resources (DNR), some from Department of Revenue (DOR) and a significant amount from the Department of Law (DOL), because "as it turns out that everybody sues mines."

Mining has an interesting arrangement where for the large mines the state bills back to the large mines, the cost of permitting and some costs for compliance and enforcement. Those are billed through DNR, but the costs are actually to DCCED and ADF&G. This is a voluntary program.

4:53:10 PM
SENATOR MICCICHE asked how he values the cost between a renewable fish, timber, and tourism resource versus a severed resource.

MR. LOEFFLER said he was talking about social costs and benefits, but he didn't do that. He just stuck to the fiscal impacts to the state.

SENATOR MICCICHE clarified Mr. Loeffler was presenting the GF impacts.

MR. LOEFFLER answered yes and the Permanent Fund. He recapped that four local governments get a significant amount of money from mining, because it's the four places where large mines exist within a local government. He also pointed out the capital budget averaged around $4 million a year. There were only two real capital budget programs (Ambler Mining District and the Strategic and Critical Minerals Assessment).

4:54:37 PM
He used mining revenues, like fish revenues, depend on prices. So, 10 years ago when prices were $250 an ounce for gold, the state got a lot less revenue. Now, the state gets a lot more as the number of mines has increased as well as the price of zinc and gold.

He didn't include some revenues in the study for a couple of reasons. The Alaska Railroad that gets $20 million from Usibelli Coal Mine is not included for two reasons. First, the revenue is greater than the cost, but more importantly, it doesn't go to the legislature. It is separate and doesn't get GF appropriations for operating and it doesn't return operating monies to the state. The Alaska Industrial Development and Export Authority (AIDEA) is a similar situation. Red Dog paid $12 million in 2013 for use of the Red Dog road owned by AIDEA; AIDEA had bonds to build that road and they cost less than the $12 million, but AIDEA keeps that money. Some is returned to the legislature, but they didn't track that back.

4:56:48 PM
The overall conclusions for mining are that the revenue is significantly greater than the cost and there are enough concentrated municipalities to fiscally depend upon the revenue for the mining industry.

MR. LOEFFLER said tourism is harder to quantify. For example, the sport fishery is managed for tourists but also for residents. A capital appropriation given to the Anchorage Museum helps the 50 percent of their visitation which comes from tourists, but it also help residents. So, there is an overlap that is difficult to assess and the tourism conclusions are somewhat less precise than for the other industries.

He said tourism brings in about $80 million to local communities. For just the state, tourism brings in roughly $18-20 million more than the operating budget and adding the average capital budget from 2012/13 tourism breaks even. But tourism provides a lot of money for local communities. Less than half the revenue is from cruise ship taxes instituted in 2006, about one-third is from non-resident fishing and hunting licenses, 10 percent is from rental vehicles from tourists and 9 percent is from corporate income tax. A majority of the money comes from the portion that he allocated from the Sport Fish Division in ADF&G and Tourism Marketing in the DCCED.

4:59:07 PM
For a sense of their economic assumptions, the operating budget was built on a commensurate proportion of services used by outsiders: about 20 percent of the state parks budget is from outsiders, 43 percent of sport fishing anglers days are done by tourists, and their operating budgets for tourism were calculated accordingly. For the capital budget in a three-year period they looked at 110 projects which were in part tourism related and allocated a portion of the projects to tourism and that amounts to roughly $20 million a year.

Municipal revenues: $13 million is from the cruise ship tax, local sales tax and bed tax; dockage and moorage revenue are mostly Juneau and Ketchikan fees on cruise ships. They used the same caveats because the economic assumptions for tourism have some overlap with expenditures that benefit residents. The averages for a bear hunt aren't the same as for a cruise ship or a fishing lodge. The costs the state spends for each are different, but there are also some revenues they didn't include like from the Railroad ($1 million from out-of-state visitors) for the same reason they didn't include it in mining. It doesn't come to the legislature and they don't know what the cost is.

5:01:30 PM
The Marine Highway was a little confusing, because it gets about $20 million in revenue from outsiders, but the Marine Highway loses enough money in general in providing its services that if

it had less tourists, and therefore ran less ships, the state might actually save money. So, previous studies that included the Marine Highway as a net cost seemed too weird.

SENATOR STEDMAN said he didn't want people of Alaska to think that the way to get out of this hole is to shut down the Marine Highway and the more vessels they tie up the shallower the hole is.

MR. LOEFFLER apologized for any implications that he sent in that direction.

5:02:10 PM
He said their overall conclusions are that tourism brings in more than the state expends in operating money, but it gives roughly $80 million to the local communities throughout the state. One observation is that the mining industry costs very little for the state to manage and a lot less money relative to others. Second, and this response goes to Senator Wielechowski's question on percent of first market value. The ex-vessel value of fishing, the value of the minerals and the value of tourism expenditures that the state gets in revenue are relatively equal across the board, and they all go up and down.

CHAIR GIESSEL asked him to explained "first market value."

MR. LOEFFLER answered that it is the value of each item "before processing." For fishing it's the ex-vessel value; for mining it's the value of the minerals before they have been smelted out of state; for tourism the value of tourism expenditures is used. It's really the value of the resource that the state owns.

SENATOR WIELECHOWSKI asked for data on how Alaska compares to other states.

MR. LOEFFLER said he didn't know other states' fisheries or tourism. A DOR study compared Alaska to other states and countries with respect to taxes and found that Alaska was in the middle.

SENATOR COSTELLO thanked him for all the data and the work he did on this.

MR. LOEFFLER said he had two more caveats: one is that any of these revenues pale with respect to oil, although they are all very valuable industries for maintaining the health of our

communities, our employment, and for social and cultural objectives.

SENATOR STOLTZE remarked that his fishermen friends tell him that a King salmon is worth more than a barrel of oil. He asked him to compare the benefit of the two to the Alaska treasury.

MR. LOEFFLER said he couldn't do that.

5:06:05 PM
His last caveat is that these industries are valuable not just for their fiscal impact but for their economic impact to people's wellbeing in communities.

CHAIR GIESSEL commented that it costs industry about $53 barrel to extract a barrel of oil and they are being paid about $32 for it today. Finding no other questions, she thanked Mr. Loeffler for his presentation.

5:07:49 PM
ADJOURNMENT

The Senate Resources Standing Committee was adjourned at 5:07 p.m.