

**ALASKA STATE LEGISLATURE
HOUSE SPECIAL COMMITTEE ON FISHERIES**

March 16, 2023

10:00 a.m.

MEMBERS PRESENT

Representative Sarah Vance, Chair
Representative Kevin McCabe
Representative CJ McCormick
Representative Ben Carpenter
Representative Craig Johnson
Representative Rebecca Himschoot

MEMBERS ABSENT

Representative Louise Stutes

COMMITTEE CALENDAR

PRESENTATION(S): ALASKA MARINE SALMON RUNS

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

KATIE HOWARD, PhD, Lead Scientist
Salmon Ocean Ecology Program
Department of Fish and Game
Anchorage, Alaska

POSITION STATEMENT: Gave a PowerPoint presentation, titled "

ACTION NARRATIVE

[10:00:40 AM](#)

CHAIR SARAH VANCE called the House Special Committee on Fisheries meeting to order at 10:00 a.m. Representatives McCabe, McCormick, Himschoot, and Vance were present at the call to order. Representatives Carpenter and C. Johnson arrived while the meeting was in progress.

CHAIR VANCE announced that the only order of business would be a presentation by the Alaska Department of Fish and Game.

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PRESENTATION(S): Alaska Marine Salmon Runs

KATIE HOWARD, PhD, Lead Scientist, Salmon Ocean Ecology Program, Department of Fish and Game (ADF&G), gave a PowerPoint presentation, titled "Alaska Marine Salmon Research" [hard copy included in the committee packet]. She stated that the presentation will be a high-level overview of the Salmon Ocean Ecology Program (SOEP). She pointed out the staff of SOEP, which are mainly focused on marine salmon research, as seen on slide 2. She gave details on the staff members.

DR. HOWARD addressed SOEP's objectives, as seen on slide 3, which read as follows [original punctuation provided]:

Understand the marine life of Alaskan salmon

Use this information to assist fishery management decision making

Answer pressing questions about what drives Alaskan salmon abundance

DR. HOWARD pointed out that the state has invested in a large array of coastal and fresh water monitoring projects for salmon throughout the state. These mostly monitor returning adults, and these programs include test fisheries, fish weirs, counting towers, sonars, and aerial surveys, as depicted on slide 3. She noted that marine monitoring assessments have been lacking in Alaska and in most of North America, compared with other countries. She stated that the international "gold standard" for monitoring salmon focuses on the salmon's first summer at sea, or the juvenile life stage, as this life stage is critical for survival.

DR. HOWARD pointed out that trawls are used to do the monitoring research; however, these are small trawls that target fish at a shallower depth, as depicted on slide 5. She stated that these surveys collect genetic information to track salmon stocks, adding that habitat, food resources, water temperatures, and other species and stocks sharing the habitat are also tracked. She moved to slide 6 and pointed out the two juvenal salmon tracking projects in the state: Southeast Alaska Coastal

Monitoring (SECM) and Northern Bering Sea Survey. She added that both of these projects were started by the National Oceanic and Atmospheric Administration (NOAA), but there is a collaboration with ADF&G. She discussed the focus of these projects, including the tracking of Yukon River Chinook salmon, which Bering Sea projects has helped with. She pointed out future forecasting projects and noted that Capital Improvement Project funding is aiding with these.

DR. HOWARD stated that the next few slides will summarize some of the ways these monitoring projects are combined with other shorter term research projects to address the marine life of salmon.

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DR. HOWARD continued to slide 7, titled "How can we better anticipate future run size?" She noted that often the size of a run is not known until well into the fishing season, and this gives little time to act accordingly to the size of the run. She suggested that understanding the juvenile marine data would better help with this forecasting.

DR. HOWARD moved to slide 8 and explained the depicted graphs on run anticipation. She stated that the graphs show that Southeast Alaska pink salmon harvests have aligned with what was predicted using the SECM survey. She noted that both graphs show the same data but in different ways. She pointed out that this forecasting has been effective and accurate.

DR. HOWARD stated that because Chinook salmon spend more time at sea, they have become easier to predict than the other salmon species, and she referred to the Bering Sea survey and the Yukon Chinook salmon, as seen on the graphs on slide 9. She noted that both graphs show the same data but in different ways. She stated that with this tool, up to three years in the future can be forecasted. She noted that the drop in data in 2022 was because surveys were not conducted because of the COVID-19 pandemic. She explained that this left two to three years of un-forecasted returns. Because the runs are currently so poor, she said that this gap is extremely unfortunate for the forecasting, as seen on slide 10. She added that this could be attributed to the heat wave in the Bering Sea when these fish were juveniles.

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DR. HOWARD moved to slide 11, titled "What is driving record poor Yukon River Chinook salmon runs?" She stated that this decline has been ongoing for over a decade, with 2022 seeing the poorest run ever recorded. She suggested that the decline is starting to be understood and can be attributed to multiple metabolic stressors acting on returning adult Chinook salmon. She explained that these salmon have the highest migration route compared to any other North Pacific salmon, and this combined with the metabolic stressors have affected the runs. She provided details on how metabolic stressors affect the salmon.

DR. HOWARD pointed out that NOAA recently awarded a grant for further research into this concept concerning the Yukon River Chinook salmon. She stated that this work will continue for the next three years. She moved to slide 13, titled "What is driving record poor western Alaska chum salmon runs?" As seen on the graph, she stated that there have been dramatic declines in this chum salmon since 2020. She stated that these runs historically have been variable; however, the recent runs are unprecedented, and she expressed the understanding that the subsistence harvesters in the region have had tremendous hardships.

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REPRESENTATIVE CARPENTER, pointing to the graph on slide 13, questioned the decline that happened around 20 years ago in the Yukon River Chum salmon return.

DR. HOWARD noted the decline in chum salmon runs in Western Alaska 20 years ago; however, she noted the runs were not as low as they are currently. She explained that the prevailing hypothesis is that there was a warm water coccolithophore bloom in the area where the juvenile salmon spend their rearing time, and this is believed to lead to poor survival in these salmon. She noted that the marine surveys did not exist at that time, so this was not observed by research. In response to a follow-up question, she defined a coccolithophore bloom, and the effects this has on the ocean visibility and filtration.

REPRESENTATIVE CARPENTER requested an explanation of the effects of warmer ocean waters and phytoplankton blooms.

DR. HOWARD responded that the question is complex. She explained that the Bering Sea is unique, as it is a sea-ice driven ecosystem. She stated that the algae are an important driver in the ecosystem each year, and as sea ice recedes these

nutritious algae, and zooplankton, which is the food for salmon, are in the water; however, when there is no sea ice, as in the last few years due to heat waves, there is no ice-associated algae. She added that there are other kinds of algae that are less nutritious, creating less nutritious zooplankton, and this follows along the food chain. She noted that the situation is different in the Gulf of Alaska.

REPRESENTATIVE CARPENTER asked whether the temperature of sea ice results in a phytoplankton bloom.

DR. HOWARD answered that this is partly because of what is in the ice, but also the growing season in the Bering Sea is much shorter so when it recedes this particular species of algae blooms, and this has a cascade effect concerning the food chain. She stated that the timing is effected by how much sea ice there is and how quickly it retreats. If the timing lines up with the animals that depend on this, this is important. In response to a follow-up question, she stated that there are chemicals and minerals in the ice, and this helps to support the algae bloom. She expressed the understanding that part of the issue specific to the Bering Sea is that there are certain species of algae that are only associated with the sea ice, and these tend to be nutrient rich, compared to other algae. In response to a follow-up question, she expressed uncertainty concerning any [man-made effort] to replace the sea ice ecosystem. She explained that this has to do with the development of the ecosystem over thousands of years.

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DR. HOWARD, moving to slide 14, stated that the chum salmon that should have returned during the recent down years of 2020 to 2022, were juveniles from 2016 to 2019, and this was during the time period that coincided with the worst warming heat wave that has ever been recorded in the Eastern Bering Sea. She stated that these years were so warm that NOAA declared emergency heat waves in 2016 to 2019. She further explained how extreme these conditions were in the area that is the prime rearing habitat for juvenile Arctic-Yukon-Kuskokwim (AYK) chum. She explained that there was also a heat wave during this time in the Gulf of Alaska, where these salmon over-winter.

DR. HOWARD, in response to a committee question, she stated that the prime rearing grounds for these chum salmon are all along the continental shelf, and this can be close to shore at times and in the exclusive economic zone (EEZ). In terms of miles,

she stated that she would need to look this up. She added that the salmon in this area are broadly distributed. In response to a follow-up question, she expressed the belief that the sampling would be encompassing most of the chum area. She noted that in the Bering Strait, where the boundary lines are close, some Russian chum salmon are present. She stated that sampling is not done outside of EEZ.

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DR. HOWARD continued to Slide 15, titled "What is driving record poor western Alaska chum salmon runs?" She stated that through marine surveys, changes to both the ecosystem and the juvenile chum salmon were being recorded during the strong heat wave years, and a report is being produced. She noted that during these years the juveniles were in extremely poor condition and more fish were reported with empty stomachs. She stated that the diet changed from high quality, diverse food to lower quality food items. It was noted that salmon and non-salmon species moved northward. She reiterated that these heat waves were unprecedented in scale, magnitude, and duration. The report shows that there has been a lag time between the heat wave and the return to normalcy, and she expressed the hope that the existence of sea ice will return to its previous state.

DR. HOWARD moved to slide 16, titled "How do predators impact the marine survival of Alaskan salmon?" She said that the department has begun tagging salmon sharks to measure the effect of predators. On the next slide, she addressed salmon that have wounds and scars from predators. She stated that this is being analyzed into patterns of predation over time. She noted that the marine mammal predators are not captured in the survey gear, as this is against the Marine Mammal Protection Act, but she added that emerging technology is allowing for more information to be collected.

DR. HOWARD, in response to a question from Representative Carpenter, stated that there are not enough studies to understand whether salmon sharks are eating salmon, and it is uncertain what these sharks eat.

REPRESENTATIVE CARPENTER expressed the concern that salmon studies have been in easy-access areas; however, the problem is "not where we are looking." He expressed the opinion that salmon sharks are much better than humans at finding salmon. He argued that research needs to go outside of the coastal waters in order to understand what is happening to salmon.

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REPRESENTATIVE HIMSCHOOT, concerning the graphic of salmon sharks on slide 16, questioned whether this is depicting one shark and why the colors change.

DR. HOWARD confirmed that the moving dots represent one salmon shark, and the colors represent the different months of the year.

CHAIR VANCE questioned other organizations conducting salmon shark studies further out in the ocean.

DR. HOWARD said that a coalition of scientists from all over the Pacific convened for the International Year of the Salmon survey, and this effort was the biggest study of its kind. During this event she said that salmon sharks had been tagged. She discussed Russian and Japanese efforts, which have been centralized more at sea and outside of their EEZ. She stated that she will discuss this further in the presentation.

CHAIR VANCE voiced her support for further funding for fisheries research. She expressed the opinion that the state is lacking in this research, as it is "behind the curve."

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DR. HOWARD moved to Slide 18, titled "Salmon Bycatch," and discussed the federally managed pollock fishery. She stated that SOEP plays a role in providing data, technical support, and scientific advice to the National Marine Fisheries Service (NMFS), bycatch task force, and to council staff. She stated that this is important because bycatch issues occur outside of the state's jurisdiction. She discussed further research that would result in predictive maps for Chinook Salmon hotspots. She expressed the hope that these maps can be provided to the pollack fisheries so this area can be avoided, reducing the bycatch.

DR. HOWARD said the council is also looking to minimize bycatch for chum salmon. She stated that SOEP is participating by providing predictive tools for the juvenile salmon, and this is in conjunction with other entities.

CHAIR VANCE questioned whether Russian hatchery salmon have an effect on Western Alaska fish.

DR. HOWARD responded that most of Russian hatcheries raise pink salmon, which do not inhabit the Bering Sea. However, Japan is raising chum salmon that migrate to the Bering Sea. She stated that these effects are a big challenge to understand, and she noted that the next slide would address this. She said Russian research shows that salmon are consuming 0 to 15 percent of marine nutrients. She pointed out that the salmon biomass is small in comparison to all the pelagic fish consuming similar food in the ocean; therefore, it is difficult to assess the problem that hatchery salmon may present. In response to a follow-up question regarding whether information from Russian scientists can be provided to the committee, she stated that these publications are written in Russian, but there are summaries [in English] that can be provided.

DR. HOWARD addressed part of the role of SOEP on slide 19, titled "Is Competition at Sea Impacting Alaska salmon?" The slide read as follows [original punctuation provided]:

- Provide information and technical advice to department leadership, the board and others
- Keep up to date and review scientific literature on interspecific salmon competition at sea and the role of salmon in marine food webs
- Participate in international expert groups assessing the role of pink salmon in marine ecosystems
- New research to better inform the issue

DR. HOWARD described some of the current published studies that have focused on competition and abundance concerning ocean salmon.

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DR. HOWARD moved to Slide 20, titled "2022 Pan-Pacific Expedition". She stated that this expedition contains several different surveys on competition at sea. She stated that ADF&G is collaborating on a project that leverages these surveys to access potential competition between AYK chum salmon and other stocks and species in the winter.

DR. HOWARD, in response to a committee question, said that the analyses from these reports on competition for AYK chum salmon will be published in a year or two.

DR. HOWARD narrated Slide 21, titled "International Data Sharing and Collaboration." She explained that because U.S. salmon do not remain in U.S. waters during their marine life, there has been an effort for international cooperation. She referenced the International Year of the Salmon effort as an example. She added that a publication will be coming out soon on this effort, and it will include a variety of studies. She discussed the North Pacific Anadromous Fish Commission (NPAFC), stating that ADF&G does play a role on the scientific committee. She listed the countries involved, which include, the U.S., Canada, Russia, and Japan. These countries share information and work together with the goal of understanding Pacific salmon. She stated that she is in the working group for stock assessments, which will soon be publishing a work on salmon stock across the entire Pacific. She stated that through NPAFC relationships, there has been a connection with resources and opportunities that would not otherwise exist.

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DR. HOWARD moved to slide 22 and spoke to the expense of marine surveys. She stated that different technologies are being investigated to help reduce these costs. One of these technologies, she said, is exploring the use of environmental DNA, which involves examining DNA in water samples. She stated that SOEP is collecting water samples during its surveys and giving these to the NOAA genetic laboratory in Juneau. She stated that another project uses salmon bones to see the life history of chum salmon, and this is being done by using new technologies.

DR. HOWARD expressed the understanding that for most people the life of salmon is an unknown. She expressed the importance of investing time and energy into communications and outreach, as seen on slide 23. She pointed out that the ADF&G website has information on SOEP. She pointed out that Facebook has become a more dynamic way to interact with the department and stakeholders, as there are several new posts a week. She invited the committee and public to interact with the department. She stated that also there are many presentations outside the salmon season to stakeholder groups, and these provide information as well as opportunities for feedback. She concluded the presentation with this.

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REPRESENTATIVE CARPENTER referenced the comment that most Alaska salmon do not stay in the state's waters. He questioned which salmon are being excluded from this list.

DR. HOWARD responded that portions of stocks in Southeast Alaska will stay in inside waters; however, she said that most salmon migrate out at least three miles, out of the EEZ.

REPRESENTATIVE CARPENTER referenced slide 14 that depicted the heat wave map. He questioned whether the waters depicted are inside or outside of state waters.

DR. HOWARD responded that the slide depicts the primary juvenile salmon rearing habitats for Western Alaska. In response to a follow-up question, she stated that in later life stages the salmon leave these grounds for deeper water. She further discussed this critical stage for salmon survival, and she noted that it is incredibly variable.

REPRESENTATIVE CARPENTER questioned whether the heat of the water would reduce the food supply to salmon.

DR. HOWARD explained that the warmer water effects both the food supply and the salmon. She explained that salmon metabolism "ramps up" when water temperatures rise, and this will cause them to starve. The other issue is that the rising temperature is effecting the entire ecosystem, which would affect the food available, the competitor species, the predator species, and other variables. She noted that there is also the tendency for a higher occurrence of disease in warmer water temperatures.

REPRESENTATIVE CARPENTER questioned how the research is prioritized at ADF&G.

DR. HOWARD explained that most of the research is funded by grant proposals, and this depends on the available grants. In response to a follow-up question, she stated that research topics, goals, and directions are mandated by the leaders at ADF&G, but it can also be driven by the funding.

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REPRESENTATIVE HIMSCHOOT questioned the roles that traditional ecological knowledge (TEK) has played, whether from fishermen or Alaska Natives.

DR. HOWARD responded that the project investigating Yukon Chinook salmon is attempting to be inclusive. She stated that the Western science arm of the program is collecting its traditional data, but this is being done in partnership with the Yukon River Drainage Fisheries Association, and this association connects with local fishermen, who have helped collect the data. She stated that another project related to the health of salmon has worked with communities to gather TEK, such as the loss of belly fat in Chinook salmon over the years. She expressed the hope that more of this information can be collected and integrated in projects with ADF&G.

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CHAIR VANCE provided closing comments.

[11:30:09 AM](#)

ADJOURNMENT

There being no further business before the committee, the House Special Committee on Fisheries meeting was adjourned at 11:30 a.m.