



# ONCORHYNCHUS

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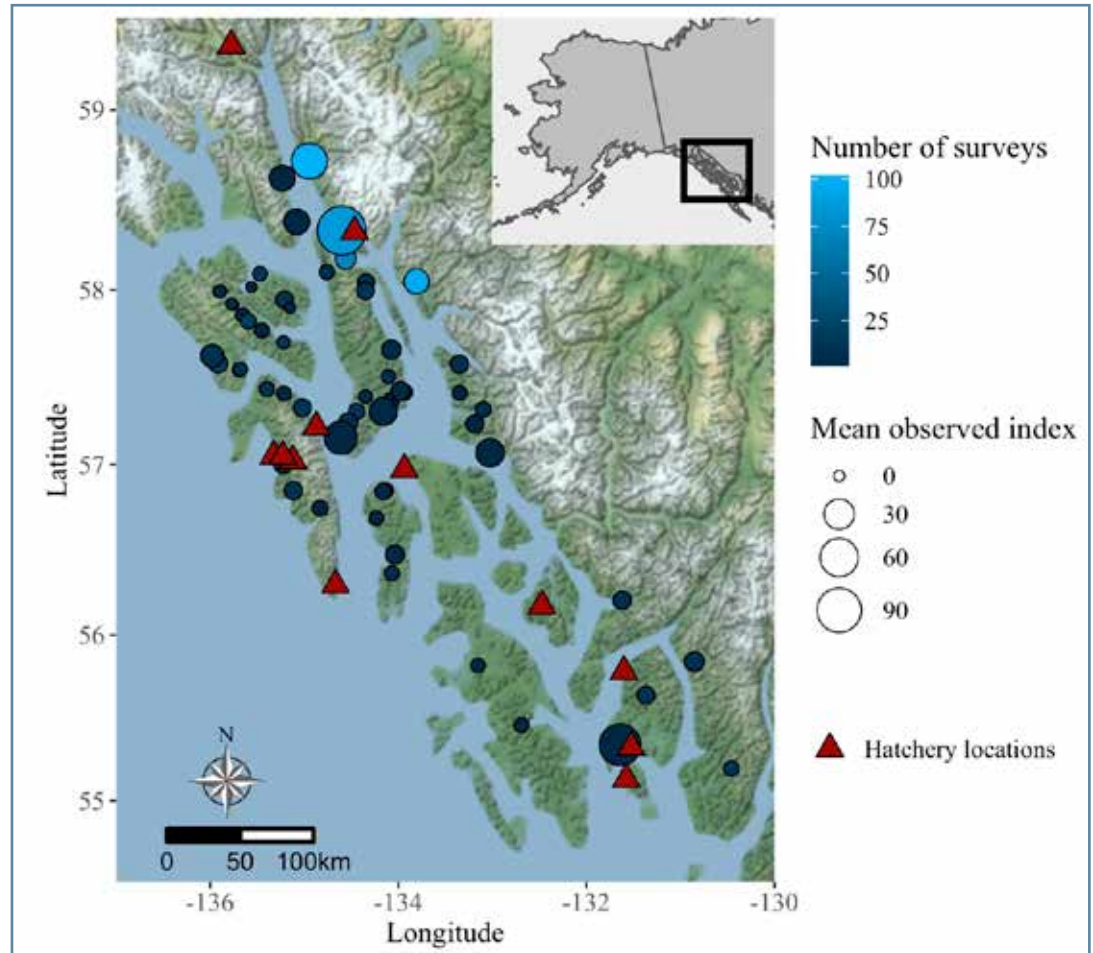
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## Revealing Stream Attractiveness to Stray Hatchery Origin Chum Salmon in Southeast Alaska

Molly K. Payne

Anyone who studies salmon knows what extraordinary creatures they are. After spending 1–7 years at sea and swimming hundreds or even thousands of miles, most salmon successfully home, or return to the same stream in which they were born. Homing, or natal philopatry, returns salmon to streams that they are adapted to and where they will have higher breeding success compared to other locations. An important nuance to note is that most salmon home, but not all do. Some salmon individuals disperse, or stray, which means they return to spawn in a non-natal stream. Straying facilitates gene flow, colonization of new habitats, and may even produce a few lucky individuals who will have spawning success in the event of environmental catastrophe in the home stream. Homing and straying behavior are ostensibly at odds with one another—one mediates reproductive isolation and generally higher spawning success, while the other mediates gene flow and a lower likelihood of, but possibly

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*Streams in Southeast Alaska that were included in the stream attractiveness model. The mean observed attractiveness index is the mean of the attractiveness indices for each year a stream was surveyed, defined as the number of strays detected divided by the number of surveys in a given year. A higher number of surveys indicates greater confidence in the average number of hatchery Chum Salmon straying to a site over time. Figure created by Molly Payne using the R package 'ggmap' (Kahle and Wickham 2013).*

## The President's Corner



Megan McPhee  
AFS Alaska Chapter President.

Greetings AFS Alaska Chapter members! If we haven't met yet, I'm Megan McPhee, your new Chapter President. I've been living in Alaska since 2010, although I am a Pacific Northwesterner at heart. I was born in Seattle but grew up mainly on the east side of the Cascades, in a little town called Naches (with a few detours along the way — Vermont, Calgary, Monterey). I got my B.S. in Fisheries from the University of Washington and spent my college summers working for the UW Alaska Salmon Program in King Cove and Aleknagik. For my Ph.D. I studied the ecology and conservation genetics of the Rio Grande Sucker (*Catostomus plebeius*) at the University of New Mexico. I homed my way back to Pacific salmon during a postdoc at the University of Montana, where I studied the relationships between life history and population genetic structure of Rainbow Trout/Steelhead in Kamchatka and Sockeye Salmon in the Kuskokwim drainage. In 2010 I was fortunate to join the faculty of the Fisheries department at UAF at our Lena Point facility in Juneau and I haven't moved since. My husband Jamal Moss is also a fisheries biologist — and a Chapter Past-President! — and we have a 10-year-old daughter who is a formidable sculpin stalker.

It feels strange to transition to President after serving last year as President-Elect. The President-Elect term is the most intense, due to serving as chair of the annual meeting. I am pleased to report that not only did I survive the meeting, I actually

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## Stray Hatchery Origin, continued

greater, reward in terms of reproductive success. In practice, homing and straying exist in a dynamic balance with one another, thereby allowing salmon populations to simultaneously reap the benefits of both behaviors. Salmon are extraordinary indeed!

Because straying behavior is a fundamental biological attribute of salmon, the hatchery salmon that we derive from wild populations also stray to some extent. Straying by hatchery produced salmon can broadly be defined as the return of adult hatchery salmon to sites, be they hatcheries, hatchery release sites, or streams, other than those to which they were intended to return. Depending on the hatchery program, hatchery strays may cause management headaches and pose conservation concerns, ranging from confounded wild spawner escapement estimates where hatchery and wild salmon mix ([Johnson et al. 2012](#)), to interbreeding between hatchery and wild fish and subsequent fitness declines in the wild population ([Christie et al. 2014](#)). In the interest of mitigating these issues, it is helpful to understand what factors influence straying by hatchery-origin salmon. It is already known that hatchery-produced salmon stray more when they are transported down rivers by barge during juvenile life stages, as transportation by humans impairs the natural olfactory imprinting process that guides the salmon home as adults ([Keefer et al. 2008](#)). Older salmon are sometimes known to stray more as well, possibly due to memory loss or changes in freshwater smells over time ([Quinn and Fresh 1984](#), [Hard and Heard 1999](#)) These factors that we already understand—sense of smell and age—are fish characteristics. We know much less about recipient habitat patch, or stream characteristics, that might influence the extent of straying by hatchery-produced salmon. Research on the extent of dispersal (straying) by wild Sockeye Salmon between two creeks in southwestern Alaska revealed that the stream with better habitat (more vegetative cover and less bear predation) received 50 strays from the other stream. Meanwhile, the first stream received only a single stray from the other site. Even more intriguing was that the salmon that ultimately strayed were often observed at the mouth of their

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## President's Corner, continued

really enjoyed it! It would have been nice for us to be able to gather in Juneau, but at the same time the virtual format enabled broad participation from across the state and beyond. We had 85 presentations and over 220 attendees. We had wonderful plenary speakers — Dr. Amanda Kelley (UAF), Dr. Yumi Arimitsu (USGS), and President Richard Peterson Chalyée Eesh (CCTHITA) — and a fun evening chat with fisheries reporter Laine Welch. Despite folks being burned out on virtual meetings, we had at least 50 attendees at each of the sessions I was able to join, and impressive participation (> 90 attendees) in a Racial Equity dialogue hosted by the Tamamta program ([www.tamamta.org](http://www.tamamta.org)), even though the dialogue took place on a Friday following three full days of programming. We also had great attendance at the four workshops offered, and another exciting film festival hosted by the Southeast Alaska Fish Habitat Partnership. A big congratulations to all of you Chapter members who contributed presentations and/or attended sessions — together you helped make the meeting a success!

I could probably fill a whole *Oncorhynchus* issue with acknowledgments to those who helped pull off the annual meeting. First, I am grateful to Sue Mauger (Cook Inletkeeper and now AK AFS Past President) for being the first President-Elect to plan a fully virtual AK Chapter annual meeting and showing me how it's done. Second, I'd like to thank the members of the Organizing Committee: Cheryl Barnes (NOAA/UW and AK AFS DEI Committee chair); Taylor Cabbage (UAF and outgoing AK AFS Student Representative); Jeanette Gann (NOAA); Debbie Hart (SEAK Fish Habitat Partnership); Heidi Ingram (ADF&G); Sara Miller (ADF&G and AK AFS Continuing Education Committee chair); Keenan Sanderson (Ketchikan Indian Community), and Erik Schoen (UAF and now AK AFS President-Elect). These individuals put in a ton of volunteer time to help get the meeting off the ground. Jeff Falke (UAF and an AK AFS Past President) organized the student presentation competition, and Sara Miller, Justin Priest (ADF&G), Khrystl Brouillette (SEAKFHP), and Kelly Ireland (UAA/UAF) taught much-appreciated continuing education workshops. I thank all the folks who chaired symposia or contributed talk sessions and the students who

provided technical support during each of the Zoom sessions. I'd also like to thank the meeting sponsors — North Pacific Research Board, GCI, Sealaska, and the Southeast Alaska Fish Habitat Partnership — and the individuals and companies who donated items to the annual Silent Auction. Finally, a big thanks to Celia Bower (a UAS alum) for creating the beautiful meeting logo — you can find out more about her art at [www.celiabowerart.com](http://www.celiabowerart.com).

At the annual business meeting, we transitioned the Executive Committee. I'd like to welcome our new members: Donnie Arthur as Vice President and Jonah Bacon as Student Representative. Donnie rejoins the committee after serving as a previous Student Representative. We are thrilled to have him back, and equally excited to welcome Jonah. The Alaska Chapter is powered by volunteers, so please thank Donnie and Jonah for stepping up the next time you see them. On a more bittersweet note, we recognize our departing members: Stephanie Quinn-Davidson, Past President, and Taylor Cabbage, Student Representative. Stephanie has provided solid leadership for the past four years — she was the first meeting planner to have to deal with the COVID-19 pandemic — and she has pushed the Chapter to become a more diverse and inclusive organization. Stephanie's departure from the ExComm leaves a big gap, but we wish her the best in an exciting year to come! Taylor selflessly gave her time and energy to the Chapter for a full year while also working as a Fisheries graduate student. She organized the Fish Trivia and Silent Auction events at the annual meeting and made sure that student concerns were heard during all aspects of Chapter business. I imagine that Taylor (and her advisor) are looking forward to her having more time to focus on her thesis, but we will miss her dearly. Best of luck to you, Taylor, and hopefully we'll see more of your fish sketches in future *Oncorhynchus* issues!

Next year's meeting is to be held in Fairbanks the week of March 27-31. If you have questions about the upcoming meeting, please contact our new President-Elect, Erik Schoen, at [presidentelect@afs-alaska.org](mailto:presidentelect@afs-alaska.org). Meanwhile, I hope you enjoy a beautiful Alaska spring and best of luck in prepping for the summer field season. 🐟



## Stray Hatchery Origin, continued

natal stream, suggesting that these fish knew where home was and yet chose an alternative location for spawning ([Peterson et al. 2016](#)). In light of this information, might recipient stream habitat characteristics help explain patterns of straying by hatchery-origin salmon?

My collaborators and I endeavored to answer this question using data on the numbers of stray hatchery-origin Chum Salmon spawning in streams in Southeast Alaska. Hatchery-origin strays are pervasive, though generally low in abundance, in streams throughout the region. The exception is a small subset of streams which consistently receive tens or even hundreds of hatchery-origin spawners, possibly suggestive of attractive characteristics of those streams. These straying statistics are particularly problematic in light of the State of Alaska hatchery policy that specifies that interactions between hatchery and wild fish on the spawning grounds are to be minimized ([Davis et al. 1985](#)). Furthermore, fishery escapement thresholds are set based on spawner escapement estimates, which at present do not incorporate hatchery stray contribution to the number of spawners in a stream. Thus, in addition to better understanding what ecological factors influence straying in hatchery salmon in general, our work has the benefit of contributing to hatchery management goals in Southeast Alaska around understanding where hatchery strays go, and why.

We downloaded data from the [Alaska Hatchery Research Project](#) (2013–2019) and from an earlier study (2008–2011; [Piston and Heintz 2012](#)) that reported the number of hatchery-origin Chum Salmon spawning in 57 streams throughout Southeast Alaska. The number of surveys and the total spawning population size varied among streams, so we defined the number of strays in a stream as the average effective number of hatchery strays. The effective number of strays was calculated as the total number of hatchery strays detected across all surveys divided by the proportion of the total number of dead salmon sampled. This accounted for bias in the number of strays whereby numerically fewer strays were detected in streams in which technicians were



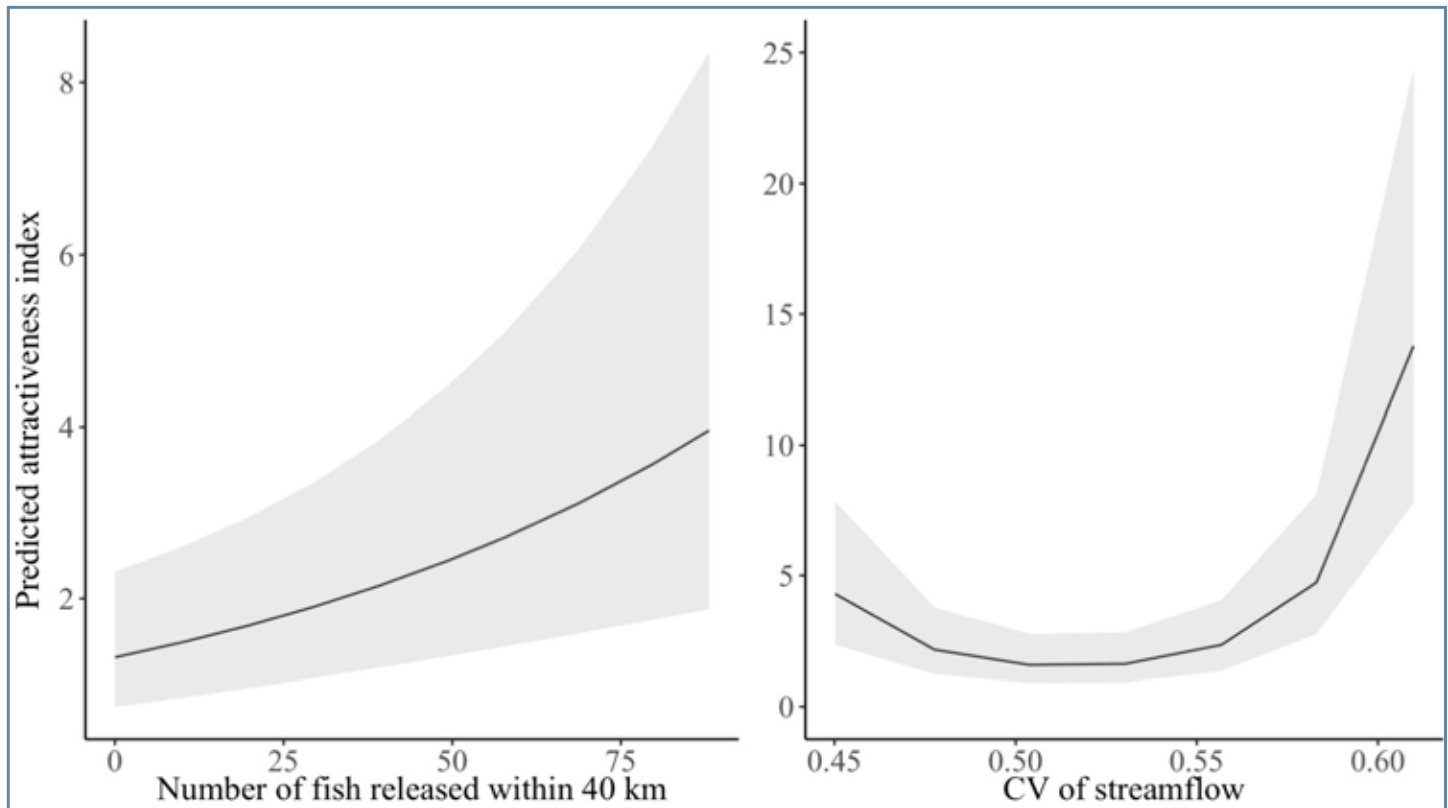
*A technician sampling a Chum Salmon carcass on a stream in Southeast Alaska. Hatchery-origin individuals were identified by their thermally marked otoliths. Photo from Kristina Tirman, Sitka Sound Science Center.*

unable to sample all carcasses within a day. The effective number of strays across all surveys was then averaged by the number of surveys to account for variable effort among sites. Hence, the average (effective) number of strays in a stream may be considered the number of hatchery-origin spawners one would expect to find if that stream was randomly sampled at peak Chum Salmon run timing. We refer to this as the “attractiveness index” of a stream. We used the attractiveness index as a response variable in a generalized linear mixed effects model with a random effect of year to predict stream attractiveness to hatchery-origin strays based on stream characteristics. The following variables were considered as potentially influential characteristics:

- 1) Fishery harvest in the corresponding management subregion to control for the effect of

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## Stray Hatchery Origin, continued



The log-transformed model-predicted attractiveness index is plotted as a function of the two covariates included in the final model. The shaded region indicates the approximate 95% confidence interval around the model predictions on the scale of each linear predictor. Figure from Molly Payne.

fishery removal of potential hatchery strays.

2) The number of hatchery-origin Chum Salmon released within 40 km of the stream 2–5 years prior to the year of sampling. The 40 km threshold was an approximate average distance from release of elevated levels of straying identified in other studies. Averaging the releases 2–5 years prior linked the number of hatchery juveniles released near a stream to the size of the returning adult population in the year of sampling. We predicted that larger nearby releases of hatchery Chum Salmon would result in more recipient strays in a stream.

3) The number of wild Chum Salmon in the stream, with the prediction that hatchery strays would be attracted to conspecifics.

4) The number of wild Pink Salmon in the stream, with the prediction that hatchery strays of Chum Salmon would be attracted to streams with large numbers of Pink Salmon because this would indicate productive habitat.

5) The long-term (1979–2012) mean stream discharge, with the prediction that hatchery strays would be attracted to streams with stronger

freshwater output.

6) The long-term (1979–2012) coefficient of variation (CV) of stream discharge. This covariate did not have a directional hypothesis, but was included as an additional metric of streamflow conditions given the general importance of streamflow in salmon choice of spawning habitat ([Bjornn and Reiser 1991](#); [Beechie et al. 2008](#)).

We included biologically plausible interactions in our set of candidate models and chose the final model as the model with the lowest AICc value. Significance of covariate effects was assessed by whether their 95% confidence intervals overlapped zero.

Our final model included the number of fish released within 40 km of the stream and a quadratic term of the CV of stream discharge. The attractiveness index of a stream increased with the number of hatchery-origin Chum Salmon released within 40 km of the stream and was greatest at the lowest and highest values for the CV of stream discharge. We interpret the effect

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## Stray Hatchery Origin, continued

of the number of hatchery fish released near the stream as an influence of propagule pressure. Releasing hatchery fish in a specific location means that adult hatchery salmon should return to that same area in the estuary and, perhaps by default or out of convenience, those fish are more likely to stray into a nearby stream. This effect has similarly been observed in other studies ([Jonsson et al. 2003](#); [Josephson et al. 2021](#)). The potential cause of the effect of CV for flow, or stream ‘flashiness,’ was slightly less clear, but we considered that the streams with low and high CVs of streamflow were also the streams that were fed by snowmelt. Snowmelt-fed streams are more temperature stable ([Lisi et al. 2015](#)), particularly during hot summer spawning seasons, and therefore may create more amenable and attractive spawning environments for prospective hatchery strays. Taken together, these results suggest that stream distance to a source population (i.e., a hatchery release site) strongly influences dispersal, or straying, consistent with metapopulation theory. However, ecological characteristics, such as streamflow flashiness, also explain stream attractiveness to hatchery strays. These results may be used by hatchery managers in Southeast Alaska to identify and avoid inherently attractive streams in the landscape. Thus, in considering the location of new hatchery release sites, it may be possible to reduce, or at least predict, the extent and distribution of stray hatchery-origin Chum Salmon.

*Molly Payne is a very soon-to-be M.S. graduate of the University of Alaska Fairbanks fisheries science program. She is from the Seattle area and graduated with a degree in Aquatic and Fishery Sciences from the University of Washington in 2018, spent a year bumming around Spain, and has been in Fairbanks since 2019. After graduating, Molly will begin work as a fisheries scientist with Owl Ridge Natural Resource Consulting, Inc., in Fairbanks.*

Back issues of *Oncorhynchus*  
can be found online

<http://www.afs-alaska.org/newsletter>

## Environmental Concerns Corner

The Department of the Interior has formed an interagency working group to gather information and develop recommendations for improving Federal hardrock mining regulations, laws, and permitting processes. Public comment is invited to help inform the efforts of the working group, which will consider a broad range of issues related to mining, such as: What science and data should be included in any decisions to permit and develop mines? Are there areas that should be off-limits from mining, and if so, how should those be identified? How can Tribes and local communities be effectively engaged early in the process to ensure that they have meaningful input into the development of mine proposals? Comments must be submitted by July 31, 2022. Virtual or in-person public listening sessions will be announced in the upcoming months. You can view the full request for information with details for how to submit comments at [Request for Information To Inform Interagency Working Group on Mining Regulations, Laws, and Permitting](#).

The Alaska Department of Environmental Conservation (DEC), Division of Water proposes to amend regulations in 18 AAC 70 and 18 AAC 83 of the Alaska Administrative Code, dealing with state water quality standards. The DEC is proposing multiple amendments and adoption of new language to clarify how state water quality standards will be interpreted and implemented in state water pollution control programs. The public comment period is open through August 1. To view the amendments and associated documentation, please go to <https://dec.alaska.gov/water/water-quality/standards/recent-activities>.

And stay tuned for an upcoming comment period — expected in late May — on EPA’s revised Clean Water Act Section 404(c) Proposed Determination for Alaska’s Bristol Bay.

If you have an issue in your region or related to your fisheries work where the Chapter could be impactful, please reach out to Sue Mauger ([pastpresident@afs-alaska.org](mailto:pastpresident@afs-alaska.org)) and Joel Markis ([jamarkis@alaska.edu](mailto:jamarkis@alaska.edu)). As chairs of the Environmental Concerns Committee, we want to bring our Chapter into conversations where our expertise has the greatest value.



## AFS Alaska Chapter Awards

### Alaska Chapter Meritorious Service Award

The Chapter Service Award (CSA) was established to recognize an outstanding contribution in any area of Alaska fisheries, including research, management, education, planning, industry, and policy development. Nominations do not have to come from AFS members, nor do nominees need to be active members. The contribution or accomplishment of the candidate must be recent and not the result of many years of effort. Our 2022 Alaska Chapter Service Award goes to Jodi Estrada with the Alaska Department of Fish and Game Gene Conservation Laboratory. In 2021, the lab undertook a trial run of genotyping at sea for the Port Moller Test Fishery. Jodi Estrada was the sole genetics lab staff person for this project on the vessel. Jodi tested the workflow and system by re-running 1,190 samples from 2020 while sailing ~1,200 nautical miles over 5 days from Seward to Port Moller. Once the 2021 sampling season began, Jodi extracted DNA from, and genotyped, another 1,190 samples that were also genotyped in parallel in the Anchorage lab. Genotyping at sea often required 12 hour shifts in challenging conditions. When Jodi did not have lab work to focus on, she was on-deck helping sample catches with the crew. She embodied the spirit of teamwork and regularly went above and beyond to help wherever she could. The season was not without its complications. There were major communication disruptions including a complete black-out when the global Iridium satellite system went down. Raging storms brought high winds and waves that forced the vessels to retreat to hunker down locations. Despite these challenges, 98.51% of the ~38,000 genotypes produced at sea on and on land were concordant. Simply put, the project would not have been successful without Jodi. Her combination of being a savvy lab and vessel person is a rare find, but add her dedication, ability to persevere in less than stellar conditions, and make no mistakes – it's almost "superhuman." Congratulations Jodi!

### Molly Ahlgren Scholarship Award

Dr. Molly Ahlgren was an Associate Professor of Fisheries and Aquatic Resources at Sheldon Jackson College in Sitka. Molly was AFS Alaska

Chapter President in 2004 at the time of her death. Molly was passionate about teaching, dedicated to her students, and felt her role was "to show people how to encounter the mystery of nature." She possessed scientific curiosity, myriad skills, experiences, and indomitable spirit to mentor undergraduate students and help advance their academic achievements. Molly's parents, the late Drs. Isabel and Clifford Ahlgren, entrusted the Alaska Chapter to create and sustainably manage the Molly Ahlgren Scholarship Fund to the future benefit of undergraduate students. Molly's parents, friends, colleagues, and the Alaska Chapter have contributed to the Fund that has provided financial assistance to students since 2006. The 2022 recipients of the Molly Ahlgren Scholarship Award were Brittany Gardner and Zoe R Munson.

### Zoe Munson

In the wise words of Molly Ahlgren, "There is a magic indwelt in nature, the mystery of life and passion, the drive to embrace each moment and not let a second pass un-experienced." Though I did not know her personally, it is abundantly clear that Molly was an amazing woman with inspiring character. Her dedicated work in Alaska fisheries as well as in education and outreach with the public in aquatic matters has left a legacy far outside of Sitka. I feel incredibly thankful to be recognized and supported in her memory, and to serve as further evidence that her impact continues to be a positive force in a field that both she, and I, value so dearly. The scholarship that I received through the Alaska Chapter of the American Fisheries Society in Molly Ahlgren's name has provided me with an opportunity to enhance my academic career at Alaska Pacific University. I am currently pursuing a degree in Marine Biology, fueled by a passion for the ocean and the "magic indwelt" in it, and work in APU's aquarium lab. Beyond my education, I hope to take advantage of the support I have received and use it to give back to the aquatic community in the future with a career in marine research and conservation.

Being involved in the American Fisheries Society is important to me as someone who hopes to make an impact, or at the very least contribute positively, to the health and prosperity of marine affairs.

## Alaska Chapter Awards, continued



Zoe Munson, recipient of the Molly Ahlgren Scholarship Award.

Being involved in the Alaska Chapter specifically makes this even more true due to the strong historical, cultural, and economic prevalence that fisheries contribute to those who live and have lived here for generations. Through the society, I was interested to learn about past fish management practices, relationships they have with their environments, and trends in salmon populations as they pertain to Alaska. Hearing projections moving forward for how to navigate these topics and more in an inclusive and driven future from professionals in the field drives my determination to continue pursuing science in Alaska's waters. I am beyond thankful for my experience so far with the American Fisheries Society, and hopeful that my continued involvement in the future will prove both beneficial for myself, the American Fisheries Society, and the community as a whole.

### 2022 Alaska Chapter AFS Best Student Presentation Winners

For the 2022 Virtual Meeting, the Alaska Chapter AFS offered best student long and lightning presentation awards at the undergraduate, M.S., and Ph.D. levels. Many thanks to all the students for their hard work, and creative and informative presentations. Presentation formats were a bit different this year as we adapted to the online venue, but the students enthusiastically embraced the technology. Additionally, many thanks to the 23

judges who volunteered their time to make the best student presentation competition a resounding success!

### Long Format Presentations

Undergraduate: No undergraduate long format presentations were submitted this year.

M.S.: Taylor Cabbage, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Factors affecting Northern Pike (*Esox lucius*) leaping ability: implications for barrier design in invaded systems; Advisor: Dr. Jeff Falke.

M.S. runner up: Luke Henslee, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Partitioning Coho Salmon landed in Norton Sound fisheries in the absence of convenient stock markers; Advisor: Dr. Andy Seitz.

Ph.D.: Matt Dunkle, Department of Fish and Wildlife Sciences, University of Idaho; Seasonal stream physical and chemical regimes create distinct aquatic food web phenologies in meltwater and non-meltwater streams near the Juneau Icefield, Alaska; Co-Advisors: Dr. Chris Caudill and Dr. Ryan Bellmore.

Ph.D. runner up: Chris Sergeant, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Spawning Pacific salmon and dissolved oxygen dynamics in southeastern Alaska rivers; Advisor: Dr. Jeff Falke.

### Lightning Presentations

Undergraduate: No undergraduate lightning presentations were submitted this year.

M.S.: Maggie Harings, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Evaluating environmental DNA as a complementary tool for estimating salmon abundance in the Yukon River basin; Co-Advisors: Dr. Andres Lopez and Dr. Erik Schoen.

M.S. runner up: Lindsay Turner, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Combining forage fish datasets to understand spatial and temporal patterns for management; Advisor: Dr. Curry Cunningham.

Ph.D.: Genoa Sullaway, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks; Comparison of region ocean model with in situ zooplankton field data for the Eastern Bering Sea; Advisor: Dr. Curry Cunningham. 🐟



## Christopher Estes Receives Stan Moberly Award

Christopher Estes, AFS AK Chapter member, received the Stanley A. Moberly Award for Outstanding Lifetime Achievements and Contributions to Fish Habitat Conservation. This award, named after Moberly who was an AFS AK Chapter, Western Division, and Society President, is presented annually to an individual who has achieved significant success in a fish habitat career related to research, policy, management, education, project implementation, communications, or outreach. The award covers freshwater, coastal, and marine habitats, and was developed by the AFS Fish Habitat Section in partnership with NOAA Fisheries and the National Fish Habitat Partnership.

Estes was recognized for ongoing efforts through his 47-year career to further conservation of fish habitats. Characterized by his knowledge and advocacy, Christopher has pursued opportunities to lead, implement, and support science-based legal, institutional, and public actions and solutions to conserve instream flows and water levels in rivers, lakes, and reservoirs to sustain fish, wildlife, and habitat on a global basis.

Estes' fish and wildlife career began in 1975 conducting water quality, instream flow, and water level studies for Montana Fish, Wildlife, and Parks. From 1977 until retiring in 2010, Estes worked for the Alaska Department of Fish and Game (ADF&G). A notable achievement was the 1986 development of ADFG's formal Statewide Instream Flow Program, later renamed the Statewide Aquatic Resources and Coordination Unit. Christopher coordinated fish and wildlife scientific and related technical and policy actions, including outreach, pertaining to securing rights for reservations of water under Alaska Statute 46.15.145.

Estes, representing ADF&G and collaborating with Keith Bayha, Region 7, U.S. Fish and Wildlife Service (USFWS), co-founded the National Instream Flow Program Assessment (NIFPA) to improve the abilities of state fish and wildlife agencies, USFWS regions, and Tribes to secure adequate amounts of water for fish and wildlife in rivers, lakes, and reservoirs, and to better address other water-



*Society President Brian Murphy (left) and AFS Fish Habitat Section President Gary Whelan (right) present the Stanley A. Moberly Award to Christopher Estes for Outstanding Lifetime Achievements and Contributions to Fish Habitat Conservation. Photo from AFS.*

related regional and national conservation issues. Subsequently, Christopher helped form the [\*Instream Flow Council\*](#), composed of the 50 state fish and wildlife agencies representing the United States and its territories and Canada's provincial/territorial counterparts. Estes also represented ADF&G in helping develop the 2006 [\*National Fish Habitat Action Plan\*](#), and contributed to its implementation leading to formation of the National Fish Habitat Board and the [\*National Fish Habitat Partnership\*](#) (NFHP). Collectively, these actions contributed to the success of the NFHP, and in 2020, its codification under federal law ([\*Title II of PL 116-188\*](#)).

In 2011 Estes formed Chalk Board Enterprises, LLC, and continues to provide instream flow and water level conservation services, serves on national and international advisory panels, and participates in professional organizations as an Aquatic Resources and Habitat Scientist. Christopher has been an AFS member since 1976, and in 2020 was inducted into the AFS Fish Management Section Hall of Excellence. 🐟

## Student Subunit Happenings

### *Taylor Cabbage, Student Subunit Representatives*

As the sun's warmth starts to mobilize ice and snow into flowing water, myself and fellow fisheries students feel the anticipation of spring and the flurry of meetings, symposia, and summer fieldwork planning that comes along with this season. This semester, Alaska Chapter of AFS students have published manuscripts, presented their research at virtual and in-person conferences, and networked with fisheries professionals amidst intense coursework and undergraduate and graduate research endeavors. Let's recount some of these great student opportunities and accomplishments over the past few months.

Many of us are familiar with the journey of turning a research question into a fully-fledged experiment or observational study. However, writing and publishing a manuscript that describes such a study and its implications for broader audiences is another hurdle in itself. An amalgamation of current and past Alaska Chapter of AFS Student Subunit members completed this journey by publishing a manuscript with the help of our faculty advisor Peter Westley and BLAST program coordinator Andrew Cyr at UAF. "Ecotoxicology of mercury in Burbot (*Lota lota*) from interior Alaska and insights towards human health" was a Student Subunit research project that began in 2019, with the goal of informing recreational and subsistence fishers about mercury levels in our beloved Burbot in the Tanana River Drainage. I was fortunate to join the student research team in 2020, where I helped dissect Burbot and prepare muscle and liver samples for mercury analysis. Lead authors and recent CFOS graduates Eric Walther and Donnie Arthur spearheaded data analysis and drafting the manuscript. After internal revisions within the author group and a round of intense peer review, the article was published in *Chemosphere* in early March! Learn more about mercury in Interior Alaskan Burbot and factors that correlated with accumulation of this toxic metal: <https://doi.org/10.1016/j.chemosphere.2022.134279>.

With the Alaska Chapter of AFS annual meeting behind us, we are probably thinking about the future manuscripts and reports to come from the snippets of research we shared in PowerPoint



*AFS Alaska Chapter Student Representative, Taylor Cabbage.* format. Student talks were well represented alongside fisheries professionals, and the annual Student Presentation Competition resulted in many going the extra mile to share engaging virtual slides of their research. For long (12 minute) presentations, Matt Dunkle received best presentation in the Ph.D. category with Chris Sergeant as runner up, and I (Taylor Cabbage) received best presentation in the M.S. category with Luke Henslee as runner up. Best lightening talk (5 minutes) awards went to Ph.D. student Genoa Sullaway, and M.S. student Maggie Harings, with Lindsay Turner as M.S. lightening talk runner up. Sincere thanks to the numerous volunteer judges for critiquing student presentations, and Awards Committee Chair Jeff Falke for organizing this esteemed event. Students also worked behind the scenes throughout the virtual meeting, acting as Zoom facilitators for symposia and gathering the diverse display of items for the annual meeting silent auction. Sitka Salmon Shares, a gigantic rockfish platter, and several brewery giftsets initiated some exciting bidding wars, with the membership raising over \$3,300 to fund student travel to future AK AFS meetings. Our new Alaska Chapter Student Representative, Jonah Bacon, helped considerably with the auction and is more than capable of ensuring the success of next year's student meeting activities.

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## Student Subunit Happenings, continued

As COVID-19 cases died down, the Alaska Chapter of AFS sponsored Student Symposium was able to be held in-person at UA Fairbanks and Juneau campuses on March 25, 2022. Our 25th iteration of this annual student-organized event hosted 17 presentations by fisheries M.S. and Ph.D. students assessed by 12 volunteer judges, and watched by over 100 in-person and virtual audience members throughout the day. From using stable isotopes to assess ancient cod stocks to modeling changes in adult and juvenile Chinook Salmon abundance, our fisheries students continue to conduct exciting and relevant research amidst rapidly changing climactic conditions and human dimensions. Volunteer judges critiqued student presentations to determine the best long and short presentations, with first place winners receiving monetary prizes donated by the AFS Alaska Chapter. Matt Cheng (M.S. Juneau) received best long talk and Kevin Fitzgerald (M.S. Juneau) was runner-up for best long talk, while Carter Johnson (Ph.D. Juneau) received best short talk and Aaron Lambert (M.S. Juneau) and Joseph Spencer (M.S. Fairbanks) tied for the runner-up best short talk. We also received considerable feedback from general audience members, which was combined with official judge feedback and sent anonymously to student presenters to improve their science communication skills. To thank our audience and judges for their diligent consideration of student presentations, we raffled off several pieces of local

Alaskan-made art which were also purchased with AFS Alaska Chapter donated funds. The symposium organizers Lia Domke, Matt Cheng, Will Samuel, and myself (Taylor Cubbage) sincerely thank all the students, judges, audience members, and sponsors for making this event an annual success.

As we scramble to prepare for summer, don't forget about the National AFS meeting in Spokane, WA, this coming August. Students can make the most out of this meeting by not only presenting research, but also volunteering on the Student Activities Subcommittee. Nothing is more awkward than milling among the bagels during a coffee break or sitting at the back of a presentation room, but volunteering to organize student events can help you make connections with other students and lasting impressions on fisheries professionals! Check out the [volunteer form](#) for student activities, as well as the list of [AFS student travel awards](#) to help you attend the meeting if you aren't sure about funding. Feel free to reach out to me at [tlcubbage@alaska.edu](mailto:tlcubbage@alaska.edu) with any questions. As I end my last newsletter article as Student Representative and plan to finish my M.S. degree this year, I am reflecting on how grateful I am for all the opportunities and involvement that the Alaska Chapter has offered. I hope to see many of you at future AFS meetings or on the water enjoying the fishes and habitats we work so diligently to conserve. 🐟

## AOOS Ocean Data

Indigenous coastal communities have relied on ocean resources for millennia, but climate change has created a more unpredictable ocean by influencing waves, sea level, temperature, and other factors, impacting remote coastal communities. The Alaska Ocean Observing System (AOOS) is collaborating with partners in the Pacific Islands, the Pacific Northwest, and Alaska to improve access to ocean data for Indigenous coastal communities through a new project funded by the National Science Foundation's (NSF) Convergence Accelerator program. The goal of the project is to get oceanographic data into the hands of Indigenous communities by using existing, lower cost wave buoy technology

to enable sustained community-led stewardship of the buoys. Through co-design, the team aims to provide new tools and new connections that will focus on the hyper-local scale.

### Amazon Smile

The AFS Alaska Chapter is enrolled as a charitable organization in AmazonSmile. Anyone who shops online at Amazon can support the Chapter financially, at no additional cost! Simply shop through [AmazonSmile](#) and the AmazonSmile Foundation donates 0.5% of the purchase price of eligible purchases to the Alaska Chapter. This provides an ongoing contribution for supplemental income that can be used to support Chapter projects. 🐟



## Meetings and Events

### American Fisheries Society Western Division Annual Meeting

August 21–25, 2022. The next AFS Western Division meeting, cohosted with the Society meeting, will be in Spokane, WA. More information will be posted at <https://wdafs.org/meetings/annual-meeting>.



### American Fisheries Society Alaska Chapter Annual Meeting

March 27–31, 2023. The 49th annual meeting of the AFS Alaska Chapter will be in Juneau, AK. More information will be posted at <https://afs-alaska.org>.



## AFS Code of Conduct

The Ethics and Professional Conduct Committee (EPCC) of the American Fisheries Society has developed a code of conduct for our meetings and AFS-sponsored functions, whether virtual or in person. This brief document is available at <https://fisheries.org/about/governance/afs-meetings-code-of-conduct/>. Please read through this document to ensure that we are collectively working to build awareness of this policy to ensure that all AFS-related gatherings are a respectful and inclusive experience for everyone. If you have questions, reach out directly to the EPCC Chair Brian Missildine for support at [brian.missildine@dfw.wa.gov](mailto:brian.missildine@dfw.wa.gov).

## ONCORHYNCHUS

Oncorhynchus is the quarterly newsletter of the Alaska Chapter of the American Fisheries Society. Material in this newsletter may be reprinted from other AFS websites.

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## 25-and 50-Year Members

The Alaska Chapter recognizes Lisa Stuby for being an AFS member for 25 years, having joined in 1989. In addition, four members reached their 50-year mark as AFS members during 2019–2021. Richard Reed of Juneau joined AFS in 1969; Roger Saft of Anchorage joined in 1970; and Mason Bryant of Douglas and Charles Krueger of Chelsea, MI, have been members since 1971. Thank You, Lisa, Richard, Roger, Mason, and Charles for your decades of membership and service to AFS and professionalism in the aquatic field!

## Fish of the Week!



Join us every Monday for our Fish of the Week podcast! We get to know all the fish — how they live in Alaska, what habitats they use, what they eat, and where they go and why. Everything you need to know to appreciate and conserve these fish and be a successful angler.

[\*We've got lots of fish stories.\*](#)

## Alaska Chapter Officers

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**Feel free to contact the Executive Committee members.**