

# SEA STAR

## Summer 2025

Salmon and Climate Initiative A collaborative cross-border effort.....	2
Skills and Drills A new course for commercial fishermen.....	3
Upstream app A new tool for habitat restoration.....	4
Meet the fisherman Roger Bain of the Makah Tribe.....	6
Field notes Recent happenings at WSG.....	8
Seafood Direct Marketing Manual The newly revised 6th edition.....	10

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# The Salmon and Climate Initiative brings a broader perspective to recovery efforts

By Jess Davis, WSG Science Communications Fellow

**B**ig actions often start with simple dreams. Nearly 40 years ago, many Washington state salmon fishermen began noticing declining stocks in salmon populations. Livelihoods impacted, a group of these fishermen felt a sense of urgency to initiate an effort to reinvigorate Washington salmon fishery stocks. The simple dream of reinstating the status quo, of restoring a sense of normalcy in the day-to-day life of salmon and fishermen, is how Long Live the Kings (LLTK) was born.

LLTK is a nonprofit organization that advocates for salmon restoration and sustainable fishing practices in the Pacific Northwest. Their vision? A Northwest where humans, bolstered by a thriving economy, exist in synergistic harmony with vibrant, healthy and flourishing salmon populations. Their work to realize this vision began with starting a salmon hatchery, first on Orcas Island and eventually expanding to Hood Canal. Over the decades, LLTK's work garnered attention and expanded. Other organizations increasingly launched their own salmon-recovery initiatives. While immensely helpful for restoring local salmon populations, this work was largely localized and often uncoordinated across the groups.

Knowing these efforts would only go so far, LLTK sought to lower the barriers faced by salmon through coordinated action. With support from Washington Sea Grant, LLTK created the Salmon and Climate Initiative to foster connection and collaboration for the sake of salmon conservation on a broader scale.

The issue with localized salmon recovery efforts, or any conservation project for that matter, is that natural ecosystems are all interconnected. They rely on ecosystem health to thrive. Additionally, and of utmost importance for species-specific conservation efforts, natural ecosystems do not adhere to administrative boundaries.

Take the life history of king salmon, namesake of LLTK, for instance. These fish begin as eggs that incubate in gravel beds of rivers or creeks, and once they hatch, they begin preparing for their journey to the sea. Once they move seaward and eventually migrate into the open ocean, they remain there as long as five years, travelling hundreds — if not thousands — of miles during their saltwater residency. This means that one salmon can inhabit countless jurisdictions during their lifecycle: unregulated international open ocean waters, multiple states' exclusive economic zones, state, or even county regulated rivers and streams. This phenomenon poses a problem in a world where all natural systems are interconnected, yet all regulatory agencies are not.

LLTK hopes to further realize their vision of revitalizing salmon populations through the creation of the Salmon and Climate Initiative. The ultimate goal of this program is to make salmon more resilient to environmental changes, yet LLTK realized that the first step in attaining this goal is to break down barriers

between various regulatory agencies and interest groups at the watershed level. This means that they needed to get diverse perspectives from across the Pacific Coast into the same room to answer questions such as, "What is working for you in salmon recovery? What are your limitations and how does climate change affect these? What support are you looking for at a regional scale?"

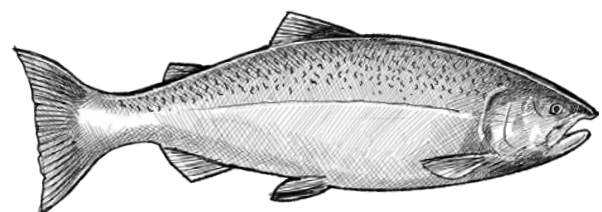
Before that, however, they needed to identify the key players in the room that would represent these diverse perspectives. To do this, they created a core project team consisting of non-profit (LLTK and the Pacific Salmon Foundation), Tribal (Salmon Defense, Port Gamble S'Klallam Tribe), Public (Governor's Salmon Recovery Office), and Academic (Kerry Naish and Lisa Seeb from the University of Washington) bodies to develop an in-person workshop bringing together local leaders of salmon recovery efforts along the Pacific Coast.

Luckily for all of salmon lovers, they were successful. The first Salmon and Climate Initiative collaborative meeting was held in December of 2023, and included over 70 folks from California, Oregon, Washington, Idaho, Alaska, British Columbia, and Yukon. While this was a strategic development workshop, held to build a collaborative framework and leverage existing local initiatives to galvanize watershed-scale planning and management practices, LLTK did what many thought was impossible: they brought people together from across geographic boundaries and professional spheres, which is no easy task.

During their time together at the Salmon and Climate Initiative collaborative meeting, experts brainstormed ideas for actions that could be included in an action plan for the first five years of the project. In 2025, they began developing the first Action Plan, which will outline specific action items that can be undertaken on a larger scale, such as funding acquisition, dam removal, identification of pathways to introduce salmon species that may be more successful under future environmental conditions, and more. In this short amount of time, over 470 action ideas were described across six themes of salmon recovery and conservation. This scoping meeting is just the beginning; right now, the team is coming together to identify action items that are best suited for the Salmon and Climate Initiative to focus on to enact real change.

The work of LLTK through the Salmon and Climate Initiative represents the groundwork for bringing key players in Pacific Coast municipalities together under the shared goal of salmon and humans living together harmoniously. As LLTK puts it, "The well-being of the Pacific Northwest is inextricably tied to the health of salmon populations."

To restore these populations to their full capacity, LLTK is taking a cue from our interconnected natural world and breaking down the municipal barriers between salmon recovery efforts.





## With Washington Sea Grant Skills and Drills training, aspiring commercial fishermen get their sea legs

By Alison Lorenz, WSG Communications Project Coordinator

“**M**ayday! Mayday! Mayday!” The student called a distress signal, indicating their boat had an emergency. Fortunately, there was no real danger at Washington Sea Grant (WSG)’s South Bend office. Students were practicing mayday calls as part of WSG’s Skills and Drills training, a new course designed to equip aspiring commercial fishermen with the skills they need to succeed.

Washington state supports a vibrant commercial fishing industry that sustains thousands of jobs and millions of dollars in economic activity. Yet a “graying of the fleet,” or increase in the average age of working fishermen, and other pressures have left the industry in need of new workers. In response, WSG pursued and was awarded a grant from NOAA’s Young Fishermen’s Career Development program to improve access to commercial fishing careers in the Pacific Northwest, developing two new programs: the Washington Fishermen and Crew Conference and Skills and Drills.

The course, explained Robert Maw — WSG fisheries specialist, Skills and Drills’ lead instructor, and a commercial fisherman himself — is designed to fill the gaps in an industry that is mostly family-based. Entering the world of commercial fishing takes a large amount of capital, as it requires buying

a vessel and the permits necessary to operate. These assets are therefore often passed down within families. But when fishermen want to hire additional workers, even if young people are interested, they often lack basic knowledge of maritime skills like boat safety and maintenance or fishing gear use and repair.

“Our goal is to break the ice, so someone could walk on the boat and not be totally naive,” says Maw. “If they’ve seen how to tie knots, mend nets, know their way around an engine room, that helps the boat owners to hire them.”

The demand for a course like Skills and Drills was clear right away. Offered for the first time, the course filled all its spots. Some students came having never set foot on a boat. Others had been sent by their captains or came of their own accord to improve specific skills. Regardless of their background, everyone was enthusiastic and ready to learn. And the WSG fisheries team, with a breadth of expertise and experience, was ready to deliver.

Day one of the two-day class was split into two: the morning was for all things boat, while the afternoon and evening focused on gear repair. Students learned triage repair for both metal and fiberglass boats as well as boat vocabulary, practicing on three different vessels made of different materials and with different layouts. A whole session on net mending taught not only knot-tying skills, but how to see the patterns in a net that guide where each knot is placed. Some skilled net menders make up to 60 dollars an hour, and that opportunity alone was enough to draw one student to the class. Maw explained that venues to learn net mending are few and far between, but “once you know it, you can fix crab pots, you can fix gillnet gear, trawl gear, you can make your own hammock, anything.”

On the second day, Jenna Keeton, WSG fisheries specialist, shared about her experience as a deckhand in Alaska to help students set expectations for life at sea. Instruction then shifted to actually running a boat safely, including touring engine rooms, navigating, and signaling to other vessels. This also included cleaning a boat and handling fish properly, a session led by WSG fisheries specialist Brandii O’Reagan that rounded out the representation of the WSG fisheries team.

Finally, it was time for the students to demonstrate all they had learned. Maw set up his pupils on a platform called Goosechase. The app offered teams of students different missions they could complete to earn points, all meant to show off their new skills. Students submitted photos and videos of themselves with one hand in a scupper and one foot in a bight, mending nets, tying six different types of knots in 90 seconds, and — to come full circle — making a mayday call. They all passed with flying colors and took photos with their certificates when the course was finished. Skills and Drills will be offered again next year, with the WSG fisheries team already brainstorming and using lessons learned to improve. “It was nice to see that people from different walks of life were interested and willing to learn,” Maw says. “It was fun to engage with folks that like hands-on, being challenged, thinking outside the box. It was nice to see there are young people still interested in the industry.”

# Removing the barriers to salmon recovery

## A new tool weighs the multifaceted factors involved in efforts to improve habitat

By Brian McGreal, WSG Science Communications Fellow

In 2018, in a case brought forth by 21 Northwest Tribes, the Supreme Court ruled that Washington State has a duty to protect tribal treaty rights by preserving fish runs. The main focus of this case was replacing culverts — infrastructure that allows streams to pass underneath a road or path, and are also commonplace barriers to migrating salmon.



Through a Washington Sea Grant-funded research project, Sunny Jardine, an economist at the University of Washington (UW) School of Marine and Environmental Affairs, along with collaborators Mark Scheuerell from UW School of Aquatic and Fishery Sciences, and Robby Fonner and Dan Holland from NOAA Northwest Fisheries Science Center, spent two years evaluating how to go about improving salmon habitat through replacing culverts. Given the high level of human activity along Puget Sound, the cost of effective salmon recovery efforts are the highest they've ever been, while the likelihood of success is

low. Under such conditions, maximizing return on investment is essential. With a new webtool, Jardine and team have provided a way to optimize the decisions behind making culvert-ridden landscapes more accessible to salmon.

For decades, populations of Chinook and sockeye salmon and steelhead trout have been listed as threatened or endangered in western Washington. Salmon recovery efforts in the state are multifaceted, with an emphasis placed on salmon fisheries management and hatchery reform. Perhaps most critical, is the effort to restore salmon habitat that has been lost or degraded due to human activities.

Habitat degradation takes a variety of forms, from stormwater runoff carrying pollutants into spawning streams, to humans clearing and developing floodplains, to lowered flows in streams due to water diversions for municipal and agricultural uses. Physical barriers also prevent salmon from accessing otherwise healthy habitats. Dams are likely the most well-known of these barriers, but culverts are perhaps more detrimental to salmon in western Washington.

In 2024, the Washington State Department of Transportation (WSDOT) documented over 2,000 culverts acting as barriers to fish passage. Culverts take different shapes and sizes, from box culverts which are in essence small bridges, to concrete pipes allowing a stream to pass under a road instead of over it. Puget Sound residents likely walk or drive over them every day without realizing. Culverts can impede salmon passage due to being damaged, by being blocked with debris, or, in the case of narrow culverts, by increasing flow rates beyond the ability of the fish to swim against.

After the Supreme Court case, the state began funding efforts to restore salmon passage by improving culverts. WSDOT completed 32 barrier renovation projects in 2023, opening over 65 miles of potential upstream habitat to spawning salmon. But with thousands of culverts creating barriers to fish passage and limited funds available to address them, the question becomes how best to target habitat recovery efforts on a statewide scale.

A question to which Dr. Jardine was paying close attention. Jardine's background studying optimization problems led her to consider how choices were being made to reclaim the most salmon spawning habitat possible from culvert restoration



projects. “In order to have any chance we really have to make sure the conservation actions that we’re taking are the best we can do for the amount of resources that we have,” Jardine says. How are the best possible decisions made under restricted conditions?



Sunny Jardine poses in front of a culvert. Photo courtesy of Sunny Jardine.

We encounter optimization problems every day, without necessarily realizing it. You walk into a grocery store with a limited budget, knowing you need to meet your baseline nutritional needs for the week, but also hoping to maximize the satisfaction you get from the foods you eat based on your tastes and preferences. In this type of experience, an agent (you) tries to minimize or maximize some outcome (satisfaction from the foods you eat) while adhering to a set of constraints (your budget and nutritional needs). In the case of salmon passage restoration in western Washington, the underlying principles are the same, but the problem is much more complicated. Often there are multiple culverts in a stream system, with varying levels of passability for fish and differing costs involved in restoration efforts. Salmon cannot gain access to potential habitat upstream of a barrier unless all those barriers downstream have also been improved. With thousands of fish passage barriers situated along various stream networks, finding the set of restoration projects that will maximize habitat gains for a given budget is no simple task.

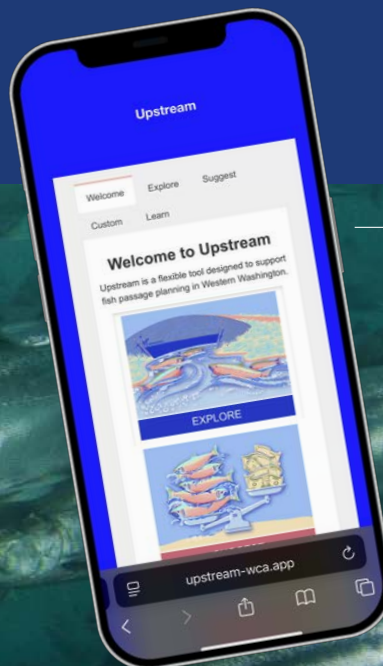
Jardine’s work began by matching the locations of barriers from the state barrier inventory with maps of stream systems in western Washington. Post-doctoral researcher Braden van Dynes also developed a cost model for barrier restoration to be

applied to the inventory. With these components, Jardine constructed Upstream, an open source web app that policymakers and managers may use to determine the optimal set of barriers to target with restoration projects based on their available budget. This tool is designed to be applicable beyond salmon in western Washington: as long as a user can meet the app’s data input needs, it can be applied to the restoration of migratory fish habitat anywhere in the world.

Jardine is interested in comparing the optimal choices found through her work to those choices arrived at from pre-existing approaches. Essentially, how close to optimal have policymakers and managers gotten with their culvert restoration decisions in the past? Where have prior decision-making processes succeeded and where have they struggled? Thus far, this work has found that existing frameworks perform fairly well against the optimal benchmarks. These are typically less computationally intensive and data hungry than large scale optimization models, making them cheaper and easier to implement. However, this evaluation is still ongoing, with the hope that the optimization tool will be able to shine a light on the tradeoffs between seeking optimal solutions or employing commonplace frameworks for prioritization.

As this project moves forward, an important next step will be to consider variability in the quality of habitat being made available. Jardine is working to incorporate stream temperature, an important element of habitat suitability, into the model. Integrating projections of future stream temperatures will also allow for choices to be made based on what will likely be suitable salmon habitat not only today, but also decades from now.

Given the opportunity to meaningfully improve the health of Washington’s salmon populations, it is of vital importance that the best possible choices are made. The work of Jardine and her collaborators has provided policymakers and managers with an extremely useful tool to enable optimal decision making. With the future of salmon at stake, the more barriers we can move to effective decision making, the better.



FIND THE UPSTREAM TOOL ONLINE:

[UPSTREAM-WCA.APP](https://upstream-wca.app)



# Who brings your seafood to you? An interview with Roger Bain, fisherman of the Makah Tribe

By Jess Davis, WSG Science Communications Fellow



The sudden loss of overseas and wholesale markets during the COVID-19 pandemic substantially impacted the seafood industry. Many fishermen and shellfish farmers felt the sudden need to explore new avenues to find customers. However, drumming up this business requires consumers who are educated in local seafood, including knowledge of what marine species are harvested and how to cook them.

In 2021, a team of fisheries and communications specialists from West Coast Sea Grant programs, including Washington Sea Grant (WSG), received three years of funding to engage in seafood education through a variety of platforms. The team created outreach materials such as the “Seafood in Season” wheel, showing when various West Coast seafoods are in season and shared recipes that showcase locally caught fish.

As part of this work, WSG developed a series of articles that feature local seafood producers. These profiles focus on the person’s unique history and harvesting practices. The series includes a broad range of people working within the entire seafood production chain, including processors. For example,

the profile on this spread highlights Roger Bain, who has participated in multiple fisheries including salmon, halibut and black cod. A member of the Makah Tribe, Bain’s profile portrays the career arc of someone with deep ancestral and familial ties to fishing. Enjoy!

**G**rowing up in Washington state and a member of the Makah Tribe, Roger Bain’s ancestral and more-recent family history might suggest that he was destined to become a fisherman. The Makah people refer to themselves as q̓w̓idiččaʔa-tx̓, which translates approximately to “The People who live near the Rocks and the Seagulls.” Aquatic organisms are integral to the Makah way of life, and they fish everything from whales to salmon and herring. In the 20th century, Bain’s grandfather hunted seals. “It’s in the blood,” Bain says of the Makah and fishing.

When I first reached out to Bain to chat with him about his career as a fisherman, I was met with an approaching deadline.

Bain expressed to me that we needed to chat, now or never, because halibut season opening day was fast approaching. He would not be available out on the water; that time is for the fish. The pressure was on — much like Bain’s introduction to commercial fishing back when he was still a boy.

When Bain was on the brink of adolescence, his parents thought that fishing could be the tool he needed to keep him out of trouble. At the age of 11, he was sent to live — and fish — with his older brother. Together, they trawled for trout and salmon: king, coho, and sockeye. Bain did not enjoy fishing much during these early days. But one fateful, chilly evening in the early 70s, he saw his brother pulling up fish and putting them in their boat. All at once, Bain was inspired to dedicate himself to learning the craft. That same night he decided to try his hand at fishing independently, unbeknownst to his brother. When Bain was caught, his brother proclaimed, “If you’re going to do it, you better do it right.” Bain’s brother began teaching him the ways of fishing. Eventually, Bain moved in with his brother permanently. He was fishing independently, and regularly, by the age of 16.

Fishing has looked different for Bain throughout his decades-long career. While he started out targeting salmon, he eventually moved on to groundfish like halibut and black cod. Fishing for groundfish was different from fishing for salmon: the primary catch mechanism is longlining instead of the gillnetting he grew up learning. There was a learning curve, but Bain pulled knowledge about longlining from his network of fellow fishermen to become successful. He was able to purchase his own boat and hire a crew to work for him. Purchasing his first boat at the young age of 24 is the event that Bain highlighted as the proudest moment of his career.

Bain’s experience fishing groundfish eventually led him to serve as the tribal representative on the Pacific Fisheries Management Council’s groundfish advisory council. Upon his appointment, he became aware of many misunderstandings about the rules and regulations required of tribal fisheries. For example, not only did tribal fishermen have to follow the same federal regulations, but they also needed observers to collect real-time data of what was being caught and discarded onboard while fishing. Bain saw his appointment as an opportunity to “[sit] on the gap” between tribal and non-tribal fishermen’s perspectives, a role he described as “positive and productive” for all parties involved.

These days, Bain is back to fishing for salmon. He says that the landscape of salmon fisheries is vastly different today than it was back in the 70s and 80s. Considering this year’s World Fish Migration Day theme, the free flow of rivers, I figured that excessive damming in Washington’s rivers was partially to blame. Bain told me, “it’s more than dams.” He noted factors like nutrient pollution caused by septic systems bleeding into

the water table and the population explosion of salmon predators. In 1972, the Marine Mammal Protection Act was passed into law, protecting charismatic megafauna such as seals and sea lions from being hunted or captured. This law has been largely successful for Washington and Oregon seals. Bain explained that it was typical to see one or two seals back in the 70s, but today you see thousands of them year round. “When you put it all together, it spells trouble for the salmon,” he says. Bain has noticed that salmon abundance is much lower. Back when he first started fishing, an average day’s haul looked something like 500 fish when he worked alone. Now he’s lucky to pull up 300 in a day fishing with his sons. Fish are also smaller than they were in years past.

Luckily, there are a number of salmon recovery efforts happening around Washington state. It is this kind of work that gives hope for the future of salmon in the Pacific Northwest, and could keep Bain fishing with his sons for years to come.



Bain's sons helping him out on the water. Photo courtesy of Roger Bain.

# FIELD NOTES

## Catch up on the happenings at Washington Sea Grant this season

### KATE LITLE WINS GOVERNOR'S AWARD



WSG interim director and deputy director **Kate Litle** won the 2025 Washington Governor's Award for Outstanding Leadership. The annual award recognizes managers in state government who demonstrate extraordinary leadership through performance results in the previous year. Maya Tolstoy, former UW College of the Environment dean, presented the nomination to Kate in June, and Kate will be formally recognized as an award winner during a luncheon at the Governor's Mansion in September.

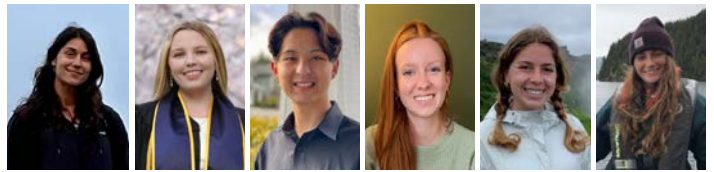
### 2024–2025 CLASS OF WSG FELLOWS



Congratulations to the 2024–2025 class of WSG fellows! Recent graduates **Aina Hori**, **Jason Gronich**, **Caitlin Lawrence** and **Helena McMonagle** were awarded the Knauss Marine Policy Fellowship, through which they are spending a year at a federal agency or legislative office in Washington, D.C. **Elise Adams**, **Jessica Clemens**, **Nika Hoffman**, **Heeju Jung**, **Jess Lechtenberg**, **Allison Morgan**, **Courtney Murphy**, **Rondi Nordal**, **Katalin Plummer** and **Jack Winterhalter** were awarded the WSG Hershman Fellowship, which places fellows in marine and coastal host offices throughout Washington.

The 2024 WSG Keystone Fellow is **Jezella Peraza**, who is working at the Seattle Aquarium with an emphasis on building pathways into marine science, policy and related industry careers for individuals who are historically underrepresented in those fields. The 2025 Keystone Fellow is **Erick Dowell**, who is collaborating with Puget Sound Restoration Fund on innovative restorative mariculture projects. We also welcomed Science Communication Fellows **Maddie Gard**, **Luciana Calle**, and **Mel Lemke** over the fall, winter and spring.

### WSG STUDENT ASSISTANTS



WSG was thrilled to work with six UW graduate students in student assistant roles this past academic year. (Left to right) **Dana Grant** worked on K–12 education and outreach projects; **Emma Klessig** focused on seaweed and shellfish aquaculture programs; **Isaac Olson** contributed to the California Current Acidification Network; **Jane Wybenga** worked in administration and human resources; **Maya Ades** worked with the research team, and **Olivia Horwedel** did communications for the Indigenous Aquaculture Collaborative.

### TIDE'S OUT MANAGER LEADERSHIP SUMMIT 2025



With funding from the National Sea Grant Office, WSG organized the first Tide's Out Manager Leadership Summit in February 2025. Coordinated by WSG social science and education specialist **Nicole Naar** and WSG aquaculture specialist **Ashleigh Epps**, this program aims to further workforce development in Washington's aquaculture industry, including through providing resources to support English language learners.

### YOUNG FISHERMEN'S DEVELOPMENT ACT FUNDING



WSG was one of four Sea Grant programs to receive funding through the Young Fishermen's Development Act to develop projects to help entry-level fishermen build their careers. With this grant, fisheries specialists **Robert Maw**, **Jenna Keeton** and **Brandii O'Reagan** as well as **Bridget Trosin**, fisheries and boating lead, are providing and developing the Skills and Drills technical training for new fishermen as well as the Washington Fishermen's Convention, which will prepare the next generation in the workforce while fostering valuable networking opportunities among both newcomers and experienced fishermen. The Convention will be held December 4–8 in Westport.

## OUTSTANDING COMMUNITY IMPACT AWARD



We are happy to announce that **Nicole Naar**, WSG social science and education specialist, was selected to receive the UW College of the Environment's 2025 Outstanding Community Impact Award. This award recognizes stakeholder engagement that stimulates, inspires and drives interactive uses of environmental science and information to impact the broader community. The

Awards Committee was impressed with the way Nicole exemplifies the spirit of this award by engaging with diverse constituents to convey complex information respectfully and accurately. Congratulations Nicole!

## \$8.1 MILLION IN FEDERAL FUNDING AWARDED



WSG and the UW Climate Impacts Group (CIG) collectively received \$8.1 million in federal funding to strengthen local capacity in responding to climate hazards on the Washington coast. As part of this initiative, WSG will lead the development of a new Coastal Resilience Fellowship program, which will provide critical workforce development to increase professional capacity across the state to tackle the challenges facing coastal communities due

to climate change. "By supporting early career fellows embedded in these communities, we are not only advancing coastal resilience but also investing in the next generation of leaders equipped to tackle these challenges head-on," said **Deborah Purce**, WSG fellowships and research lead. New staff member **Becky Bronstein** is focused on launching this fellowship. The grant also supports the implementation of a small grants program for coastal Tribes in Washington, which CIG is leading.

## 20 YEARS OF CLEAN MARINA



WSG's Clean Marina program is celebrating 20 years of preventing pollution in our marine environments. Boating program specialist **Aaron Barnett** and coastal policy specialist **Bridget Trosin** run the program, which works with marinas to set goals and implement pollution-prevention and environmentally friendly practices.

## WSG FAREWELLS



Two longtime members of the WSG Communications team announced their retirements: **MaryAnn Wagner**, former assistant director of communications, retired in December 2024 after ten years spearheading WSG Comms.



**Robyn Ricks**, creative director and graphic designer for WSG, retired in June 2025. Ricks started at WSG in 1998, and her strong sense of design and color, as well as her love of nature, have shaped the visual world of WSG for years to come. We wish them both a very happy retirement and thank them for all their work!

## WSG WELCOMES



WSG has several new staff members: **Melissa Petrich** is a new water quality specialist, and **Becky Bronstein** is a new resilience fellowship specialist. **Kaitlyn Kowaleski** is a new postdoctoral scholar, and **Jubilee Cho** is a new graphic designer. After working for the program as a student assistant, **Elyse Kelsey** also joined WSG Crab Team as an outreach specialist. Welcome aboard!

## WASHINGTON DEPARTMENT OF FISH AND WILDLIFE FUNDING



WSG received \$185,000 in state appropriations to work with the Washington Department of Fish and Wildlife (WDFW) and the Woods Hole Oceanographic Institution to map the genome of the European green crab, shedding light on a highly invasive species. The WSG lead is marine ecologist and WSG Crab Team program manager **Emily Grason**. Mapping the genome of the European green crab will provide crucial information such as how genes play a role in enabling green crabs to adapt to a variety of environments including changing water temperatures along the Pacific coast. Knowing which genes influence key traits in green crabs could give valuable insight on the long-term management of this invasive species, a top priority of the Washington Invasive Species Council and WDFW. Governor Jay Inslee issued an emergency proclamation in 2022 in response to growing populations of European green crab in Washington waters.



TERRIE KLINGER



KATE LITTLE

In recent months WSG was fortunate to have the guidance of interim faculty director **Terrie Klinger**. As Klinger completed her yearlong leadership commitment June 30, 2025, **Kate Litle** returned to the role of interim director on July 1.



## From boat to plate

### The newly revised Seafood Direct Marketing Manual helps seafood harvesters dive into direct-to-consumer sales

By Alison Lorenz, WSG Communications Project Coordinator

**S**tarting a business is no easy feat — especially when you throw in the unpredictable nature of boat maintenance, weather, catches and wholesale prices. For many fishermen, selling their product directly to seafood consumers can be a way to regain some control in a notoriously volatile industry. But where does a fisherman who is interested in direct marketing begin?

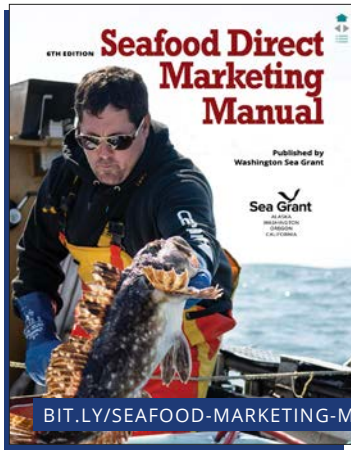
For more than 20 years, Alaska Sea Grant, in collaboration with other Pacific Coast Sea Grants, has provided the Seafood Direct Marketing Manual (formerly the Fishermen's Direct Marketing Manual) for just this type of business. The heavily revised sixth edition — a joint effort between Alaska, Washington, Oregon and California Sea Grants — was released in the fall of 2025, after two years in the making. Covering everything from business planning to ensuring seafood quality to specific state regulations, the Manual is a one-stop shop for fishermen

and shellfish growers interested in starting a direct marketing business.

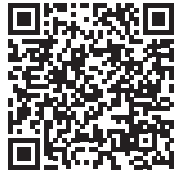
The first edition of the Seafood Direct Marketing Manual was published in 1997 as a result of changing economics in Alaskan salmon fisheries. Through the 1990s, new competition from farmed salmon caused salmon prices to drop steeply. More fishermen became interested in starting their own direct marketing operations as a way to cut out middlemen and, in theory, make more money. "There's a big draw to [direct marketing] when the price is low because it puts a lot more control back to the individual boat," explains Tav Ammu, a fisherman, Alaska Sea Grant marine advisory program agent, and coauthor of the Manual.

But selling directly to consumers can also mean a lot more work for fishermen, who must determine how to advertise, process, package, and sell their product in addition to catching it. Seeing a growing need, the Alaska Department of Commerce, Community and Development asked Terry Johnson, the late Alaska Sea Grant agent to compile information to help fishermen weigh the pros and cons of getting into direct marketing — and the first Fishermen's Direct Marketing Manual was born.

These days, salmon prices are low again in Alaska and along the West Coast. New factors have come into play, from the increasing use of social media and online commerce to the COVID-19 pandemic's impact on supply chains and consumers' growing desire to be close to their food. Accordingly, alongside evergreen



Download the [Seafood Direct Marketing Manual](#)



[BIT.LY/SEAFOOD-MARKETING-MANUAL](https://bit.ly/seafood-marketing-manual)

information about accounting and meat chilling, the sixth edition of the Seafood Direct Marketing Manual includes new information about online sales platforms, email marketing, ensuring product quality, fishermen's and farmers markets, setting up a boat for off-the-boat sales, and much more. The wealth of knowledge comes from a variety of expert contributors from Sea Grant and beyond. Every edition of the Manual has been thoroughly reviewed by fishermen who direct market their products, and fishermen who have used the Manual suggest topics that should be clarified or added. After almost 30 years and the distribution of thousands of copies, the Direct Marketing Manual provides unique value in presenting free, comprehensive information in one place, whether seafood harvesters use the PDF available online or the free printed handbook.

"I like that it is a printed book," says Sunny Rice, Alaska Sea Grant marine advisory program agent and a coauthor of the Manual. "From an agent's perspective, when I want to make sure I'm giving someone complete information, the fact that it's a package is important, rather than just telling someone to Google something."

The Manual also includes blank pages for notes and hands-on sections like a "strengths, weaknesses, opportunities and threats (SWOT)" analysis to help fishermen determine if direct marketing is right for them. Because, as first edition author Terry Johnson once put it, "It is just as valuable to prevent the wrong person from direct marketing as it is to assist the right person to begin."

Jenna Keeton, Washington Sea Grant fisheries specialist and the lead editor of the new edition, notes that while the Manual is standalone, it can supplement the content provided through Sea Grant's many fisheries offerings, such as Alaska Sea Grant's five-session direct marketing class. "This is one of many tools that Sea Grant has to help people with their direct marketing operations," she says. "The Seafood Direct Marketing Manual, [Alaska Sea Grant's] FishBiz website, in-person conferences, classes — there are lots of opportunities for direct marketers to plug into."

After all, the ultimate goal of the Manual is to support the West Coast's small-scale commercial fishing industry. In contrast to large processors who focus on quantity of product, Ammu and Rice note that fishermen interested in direct marketing are often very focused on the quality of the fish they provide. "They

want to feel more connected to their customer and have more control over what that fish is like when it gets to the customer," Ammu says. "They care a lot about the product and what they do, and want to share that directly with the customer."

"Direct marketers have been a huge piece of delivering high quality fish," Rice notes. "And they're often the gateway to people's experience with seafood." Seeing fishermen's passion through a compelling social media post, or having a face-to-face conversation at a dockside market, can be the spark that gets someone interested in purchasing local seafood like crab, oysters and salmon and preparing it at home. "That good experience might increase people's willingness to purchase it again and seek out seafood in the future," Rice says.

Fishermen get into direct marketing for many reasons. They may want to explore new markets, take more ownership of their fishing business, supplement their income, or connect more deeply with their customers. They may also decide that direct marketing is not right for them. Whatever their choice, Washington, Alaska, Oregon, and California Sea Grants are here to support them through the Sixth Edition Seafood Direct Marketing Manual and more.



A participant in Oregon Sea Grant's Shop at the Dock tour buys seafood from Chelsea Rose floating seafood market in Newport in 2023.



A worker at Chelsea Rose Seafood places salmon in a bag for a customer.



# Save the Date!

Washington Fishermen's Convention  
December 4–8, 2025 in Westport, WA

An up-to five-day opportunity for both new and experienced fishermen. The entire Convention includes a Drill Instructor and First Aid at Sea Training, a two-day conference filled with learning and networking opportunities, and a sea trial to test your seaworthiness on a commercial fishing vessel. Participants can register for the individual components of the convention.

Register online at [bit.ly/WA-Fishermens-Convention](https://bit.ly/WA-Fishermens-Convention)

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