



Secrets of the Sea

WORDS & IMAGES BY
JONATHAN BOWER

I'm late getting out of Anchorage and heading to Homer on Friday night, so I decide to camp in a parking lot a little past Soldotna. I'm scheduled to meet the next day with Margo Reveil, who, along with her husband Frank, owns and operates Jakalof Bay Oyster Company.

On waking the next morning, the weather proves uncharacteristically warm and clear for a Saturday in August along the Kenai — at least by comparison to my other trips to the area. As I coast down the highway's rise that leads into town, the sun is streaming across the bay, and the sky is such a staggering blue that it's hard to keep my eyes strictly on the road.

Not long after driving through town, my phone app informs me I'm approaching Jakalof's Douglas Road headquarters. It proves to be an otherwise unassuming two story building that I know must be my destination — not because the app tells me so, but by all the nets, plastic piping, tubes, wide rounds of ropes, and stacks of different colored coolers in the lot.

I enter through the first-floor door, where Margo and one of her summer employees stand in a space large enough to function as a garage when needed, and — with sinks, desk space, more gear, and lengthy metal tables — a reliable base of operations.

Dressed in a white apron and long blue rubber gloves that reach to her elbow, Margo greets me. Her assistant is sorting buckets of oysters hauled in earlier that day from the farm. It's an abrasively noisy affair, as shells clatter together and clang against the metal table; the shellfish equivalent of nails across a chalkboard. As they're sorted, the smaller ones pass through holes in the table's surface and tumble and crash into the plastic containers underneath. This clamorous sorting process, I soon learn, allows them to keep similarly-sized oysters together, so that smaller oysters are not competing for resources with the larger, more robust oysters in the nets. The noise, however, necessitates going back outside to have an audible conversation.

I've made the journey hoping to learning as much about oysters as I can in a single weekend, about as much time as Reveil can spare in this busy season. And yet, she exudes such a friendly degree of calm as we talk, I'd never assume she's at all pressed for time, or under pressure of any kind. She informs me that today, for example, is an "ordinary" summer Saturday at Jakalof: her day got off to a rousing start at Homer's always-bustling Saturday farmers market. Soon she'll need to leave and head over to their pop-up "shuck shack" down the road at Kenai Brewing, after which she'll drive to the docks to meet up with Frank, who will return with a skiff full of oysters following his day's work at the farm. All the while, Margo shows me the generous, unhurried regard of someone who has all the time in the world.

Soft spoken by nature and with thick, long white hair — the kind

this balding writer can't help envying — Margo is immediately reminiscent of your favorite grade school teacher. She speaks authoritatively, but always affectionately and excitedly, about oysters, and frequently pauses, contemplating the most accessible, clearest way to explain things to an oyster student like me.

An architect by training, Reveil pursued an internship in French Polynesia after "the bottom fell out of the construction market" in the states in the 1990s. She lived with Frank's family during that internship and met him there. Following their marriage, she returned, Frank in tow, to Southern California, but a continued lack of steady architecture work forced her to think of alternatives. Moving into graphic design work at UCLA just as the Internet was taking off proved a fortuitous move for her career.

In time, however, she became restless for a change. Their two kids, too, were fast approaching their middle school years and both she and Frank had their reservations about their local public school options. "We couldn't afford to send them to any private schools in the area," Margo shares, "so we started home schooling them as we considered how we wanted to proceed with our careers. Then we thought, 'Well, as long as we're home schooling them, we might as well be free ourselves.'"

At that point they decided to take to the high seas. In 2009, they packed their things into their sailboat and went sailing for three years in the South Pacific.

The decision was not necessarily as random as it might seem. If you want to live out of a sailboat for a few years, you probably couldn't do better than having Frank at the helm. He grew up in Brittany — a region known as the oyster capital of France. While he never worked in oyster farming in his homeland, he was exposed to maritime culture and related vocations early in his life; a background that, with his captain's career, has helped prepare him to

become largely responsible for the day-to-day work of caring for their Jakalof crops.

"But after three years of our life at sea," Margo explains, "our kids were feeling restless and ready to get back to life on land. My brother lives here in Homer ... and I thought it'd be nice for us to live closer to them. So, we sailed up this direction and landed here in May 2012."

Margo knew they'd need to find sustainable and engaging work as soon as they could. "The first job Frank found shortly after landing here was on an oyster farm across the bay," she recalls, "It didn't pay well at all, but he took it because he was curious about the work, and with his background in Brittany, he felt there could be some potential for an oyster farm, given the health of the waters here and the overall area."

A year later, Margo and Frank bought the Northern Lights Oyster Company, run by longtime owner Mike Nakada, and Jakalof Bay Oyster Company was born.



OYSTERS

Left to right: Lines and more lines needed to keep things organized. Margo Reveil shows off some oysters. A view of the farm. A close up of a Jakalof Bay oyster. Scene from the Shuck Shack (don't forget the hot sauce).



As Margo walks me through their yard full of gear and farming materials, she describes the functions of various nets. Oyster spat (or the oyster “seed”), measuring anywhere between 5-25 millimeters when they begin growing them, require a finer-meshed net so they don’t fall out. Fine-meshed nets, however, clog easily with algae, interrupting the ability to feed on the ocean’s phytoplankton, the essential resource for their sustenance and health. As they mature, the oysters will move to wider-meshed nets that allow them to continue feeding on the phytoplankton.

A successful crop, which can take anywhere between three to seven years to harvest, requires the regular rotation and unending management of the oysters and farming materials. “For example, if they aren’t moved and rotated enough,” Margo explains, describing only one of the unfortunate effects, “they can start to grow together.” In fact, she informs me, a significant degree of Frank’s daily work concerns the process of rotating and moving the oysters and nets, and then the more mundane but essential tasks such as tying knots, fixing engines, pumps, and other equipment. In this way, oyster farming requires no less an intensive or vigilantly attentive degree of focus than any other mindfully-farmed food you enjoy.

And, just as so many other foods I take for granted prove dependent on a specific balance between soils, sunlight, and water, Margo explains that oysters are no exception. They are part of a process reliant on the careful and sustainable cross-section of human effort and the ocean’s health and naturally-occurring processes.

“We are working to be the ultimate environmentalists on our farm and in this business, overall,” Margo emphasizes. “Obviously, we have a huge stake in having a clean ocean. Also, we give our oysters zero inputs:

We don’t add water, or any kind of extra food or fertilizers. We’ve seen, too, how ocean acidification has impacted, for example, areas as nearby as Washington state, where a lot of our oyster spat actually come from.”

Nevertheless, they are, like other oyster farms in the region, overseen and held accountable by a considerable variety of regulatory bodies. The sum of these — a list that includes Alaska Fish & Game, the Army Corps of Engineers, and the U.S. Coast Guard — insure Jakalof remains compliant with an exhaustive variety of measures guaranteeing their product consistently proves safe for consumption.

After we’ve moved back inside the building, Margo sifts through a tray of recently sorted oysters and lifts one up to show me. It is, without a doubt, at perhaps 5-6 inches in length, the longest oyster I’ve ever seen. My first thought — as the novice in the room — is the thrilled assumption that there’s a commensurate amount of meat to enjoy inside. Margo is not convinced.

“It’s possible this oyster would taste fine. But when they’re long and skinny, they can become harder to open, for starters — which isn’t ideal for a restaurant setting. Usually, too, if they have become this long it tells us the oyster was growing a lot of shell because it was reaching for food — it wasn’t getting enough to eat. ... So that could certainly impact the quality of the lump inside.” She notes that this would be something that occurs with too-densely packed nets during the growth process.

Opening another, she describes the oyster’s anatomy and I’m swept back to high school biology class, as stunned and mystified as I felt when I learned worms and insects were intricately more complex than I ever imagined. An oyster, it should not surprise me, is not merely that sole



lump of meat I slurp out of a shell.

It's then that I have to admit to Margo that I'm often bewildered by my own taste for them. We didn't eat oysters in the working-class neighborhoods where I grew up in Pennsylvania. In fact, I don't think I ever saw a real oyster before 2003, a few days after I moved to Anchorage, when I bought one for a buck from a guy hawking and shucking them at a Saturday market. Until then, my oyster experience was limited to TV and movies, where those plump, edible gobbets are served to wealthy parties on a half shell over ice on a silver tray.

The first oyster I slurped at that market didn't leave any impression that I recall — except that it tasted more like a mouthful of salt water than anything I would equate with a delicacy. Margo figures that this could have been the result of any number of different factors. "Perhaps," she suggests, "it had to do with the way he shucked and served the oyster to you." It could be, too, that the oyster's original "liquor" — the term for the naturally-occurring liquid one finds in an oyster shell — washed out of the shell when he shucked it, leading to my underwhelming experience of that first oyster.

The longer she works in the business of oyster farming, the more she's aware that our taste for oysters is influenced by a variety of things: the culture in which we are introduced to them, the region and the oysters' relationship with the ocean in which they grow and are harvested, how fresh they are when they arrive to market or table, and our preconceived notions of how an oyster should look or taste.

For instance, just that day, at the farmer's market, Margo informs me, she overheard a customer remarking that the oysters in her case looked dry, implying that they weren't fresh. She knew, however, that

they had just opened those oysters three minutes earlier. Because they're cold water oysters, they often build a lot of lipids, so that they become really, really fat. "Because they were fat," she shares, "there's just not a lot of room for sea water." Directing herself back to my experience of that first oyster, Margo goes on, "You could get a really weak oyster that gets shucked and contains a lot of sea water. The amount of sea water inside doesn't determine it's a good quality oyster."

"In France," she continues, "they have what's referred to as 'the second water.'" When they shuck an oyster, she explains, they dump out what they call "the first water" because it's only sea water. Then they let them sit for ten minutes, during which time the oyster will ooze out its own liquor. "That," she emphasizes, "is what's sweet and tastes so specifically distinct!"

In any case, Margo urges that I shouldn't overthink these matters. "The bottom line is," she shares, smiling, "if it makes you happy, you should eat the oyster." She pauses, and adds, "The goal, after all, is to enjoy the sea."

Later that afternoon, as I sit down with a plate of Jakalof oysters from their pop-up "shuck shack" outside the Homer Brewing Company, I'm not thinking about the farm, or the long drive back to Anchorage, or work Monday, or even oyster liquor and regulating measures. Instead, I'm vividly recalling my boyhood summers romping around the Jersey shore, where I'd spend entire days on the beach and in the ocean. I'm not eating the oyster as I savor this plate, but I am enjoying the sea the entire time.

If I close my eyes as I eat, it's as if I'm back there again, and I'm very, very happy. 🍷

issues happening now or coming soon?

Brandon: We are gearing up for the Lowell Wakefield Symposium in May, which draws hundreds of marine scientists from all over the world to Anchorage. This year the focus of the symposium is Cooperative Research — strategies for integrating industry perspectives and insights in fisheries science.

We're also in the early stages of planning for the next Alaska Young Fishermen's Summit in January 2020, which is an important training ground and networking opportunity for the next generation of commercial fishermen.

NPF: What success stories do you wish people knew more about?

Brandon: Our seafood technology specialist Chris Sannito helps many budding and established entrepreneurs get their processing, seafood and food businesses up and off the ground or expand to the next level.

He assists everyone from kelp salsa producers to tribal members working to get FDA certification to serve seal oil to elders in nursing homes. Together with our seafood marketing specialist, Quentin Fong, he also teaches a range of classes to get fishermen and seafood processors better educated on the latest techniques or rules and regulations affecting them.

NPF: How can fishermen become more involved in Alaska Sea Grant?

Brandon: We would love to hear from them and learn about how Alaska Sea Grant can help. We have marine advisory agents in several coastal communities from Ketchikan to Nome. Our folks have a wide range of scientific and business expertise and can assist fishermen with a variety of topics, including how to write a business plan, how to directly market their catch, how to stay safe on the water, and a lot more. They can also follow us on social media and engage with us that way. ■

It's go time!



Markos Scheer is a Seattle-area attorney and entrepreneur who has spent more than 30 years in the seafood industry. He is developing a 127-acre kelp and oyster farm near Craig, Alaska, and operates a law practice.

BY MARKOS SCHEER

So you made the plunge. You stepped off into the grand abyss and will be joining an ever-expanding group getting into the Alaska mariculture business. Once you have your site planned out and approved, built your business plan and found the funding to get started, it's time to implement your plan. Where do you start?

Sourcing raw material. In the case of oysters, that means spat or seed that's large enough to out-plant into your site. For kelp, it likely means building a hatchery or purchasing seeded line from one of the hatcheries in Alaska. **Sourcing gear** — line, buoys and anchoring systems for the build-out of your site. **Sourcing or building rafts** or other structures the operation will need. **Finding a market** for your product, including branding design and monitoring. **Building or finding a processor** that will custom process your product. **Planning transportation and logistics** to get your product to market.

Raw material can be sourced from a number of local and out-of-state, but approved, vendors. Oyster spat and seed can be sourced in Alaska from OceansAlaska in Ketchikan and Blue Starr Oysters, which operates near Marble Island off Prince of Wales Island. The primary out-of-state and approved producer is Hawaiian Shellfish. Blue Starr has floating upweller (flupsy) capacity and can produce seed large enough (say 25 mm) to be out-planted directly into trays on your farm. Other seed providers are likely to be able to provide 3- to 6-mm seed. To get seed, you should expect to pay a 25 percent deposit to secure your position in line for the beginning of the year.

To get oyster seed to an appropriate size for your site, you either need to buy or build a flupsy, or you need to work with someone who has one and can raise the seed to size. Blue Starr and the Naukati Bay Shellfish Nursery are two facilities in Alaska. Others are in the process of developing flupsy capacity, and the industry can expect to see more sources in the coming years.

Kelp seed can only be produced from seed stock sourced within 50 kilometers of the farm site and grown out in a hatchery or nursery (which is really a greenhouse to produce juvenile plants) located inside the state of Alaska. Unless you build your own hatchery, you have only a couple of options. Blue Evolution operates a kelp nursery at the NOAA facility in Kodiak, and OceansAlaska and Premium Aquatics are working together on a kelp nursery located outside of Ketchikan.

Lines, buoys and other gear can be sourced from any commercial fishing supply store or from net manufacturers like Net Systems. You can build your own rafts or have them built. Marble Construction in Ketchikan builds oyster rafts. A number of companies manufacture and sell oyster processing equipment, including tumblers, sizers and other associated equipment. The Alaska Shellfish Growers Association is also a terrific resource for information and suppliers.

Fortunately, new shellfish growers can expect to have a year or two to develop markets while the oysters are coming up to size. It is critical, however, to tee up the sale of the product and understand the transportation costs and logistics associated with getting your product to market. Will you sell directly to consumers? To distributors? Will you create your own value-added products, like Barnacle Foods is doing with kelp products out of Juneau? You should also think about a brand and artwork. How are you going to tell and sell your unique story?

Planning and implementation are essential to the success of any new venture. The best way to mitigate risk is by learning from others in the industry and use that information about technologies and systems to benefit your burgeoning business. Keep an eye on future columns that will explore this topic in more detail. ■



Juneau company makes waves with kelp

By **Paula Dobbyn** (<https://alaskaseagrant.org/author/paula-dobbyn/>) | March 26, 2019

Wild salmon, king crab and halibut are hallmarks of Alaska cuisine. But another ocean product is increasingly making its way onto store shelves and dinner plates. It's a sea vegetable called bull kelp—a salty, crisp plant packed with vitamins and nutrients such as calcium, iodine and iron.

A small but growing company in Alaska's state capital, Juneau, is harvesting kelp from local waters and turning it into tasty products like salsa, pickles and seasonings.

Barnacle Foods (<https://www.barnaclefoods.com/>) is owned and operated by Lia Heifetz, Max Stanley, and Matt Kern, who were born and raised in Southeast Alaska. The team started the company in 2016 with the goal of providing delicious, locally harvested and sustainable food. Their long-term vision is to create jobs and help Alaska boost its food security.



Bull kelp freshly harvested from the waters of Southeast Alaska. Photo courtesy of Barnacle Foods.

"There are so many high-quality foods in Alaska. Our seafood, for example, is world-renowned for its quality and sustainability. But many of our foods are abundant for very, very short periods of time. We want to help play a role in harvesting and processing local ingredients and turn them into shelf-stable foods that are available throughout the year," said Kern.



Lia Heifetz and Matt Kern aboard their boat harvesting bull kelp. Photo courtesy of Barnacle Foods.

Kern and Heifetz began experimenting with turning kelp into salsa in their own kitchen. The couple's next step was to sell it at Juneau's Public Market and Food Festival, where the product quickly sold out. That's when they knew it was time to ramp up production and launch a business. To sell food commercially in Alaska, an individual or company needs a number of permits to ensure that their products are safe for human consumption. Heifetz and Kern turned to Alaska Sea Grant for help.

A partnership between **National Oceanic and Atmospheric Administration** (<https://seagrant.noaa.gov/>) and the **University of Alaska Fairbanks** (<https://www.uaf.edu/uaf/>) (UAF) **College of Fisheries and Ocean Sciences** (<https://www.uaf.edu/cfos/>), **Alaska Sea Grant** (<http://alaskaseagrant.org>) serves as one of Alaska's process authorities, which means it can certify the safety of food production.

When Barnacle Foods was developing its product line, the company would frequently send samples to Alaska Sea Grant's seafood specialists.

Seafood technology specialist Chris Sannito, an Alaska Sea Grant Marine Advisory agent based in Kodiak, along with Brian Himelbloom, retired UAF seafood microbiologist, would evaluate the

company's kelp pickles and salsa for pH levels and other factors. Sannito and Himelbloom also assisted with jar sterilization techniques.



At the Kodiak Seafood and Marine Science Center, Alaska Sea Grant faculty tested kelp products by Barnacle Foods. Photo by Chris Sannito.

"We look over the scheduled process the manufacturer intends to use. That's the exact step-by-step process they follow to make their product as well as the specific ingredients they use. We make sure they're doing it by established scientific schedules. We also ask for a final product to make sure the levels we're looking at in the lab are the same as in their facility," said Sannito, who works out of the **Kodiak Seafood and Marine Science Center** (<https://www.uaf.edu/cfos/about-us/locations/kodiak/about-ksmsc/>), which is owned and operated by UAF.



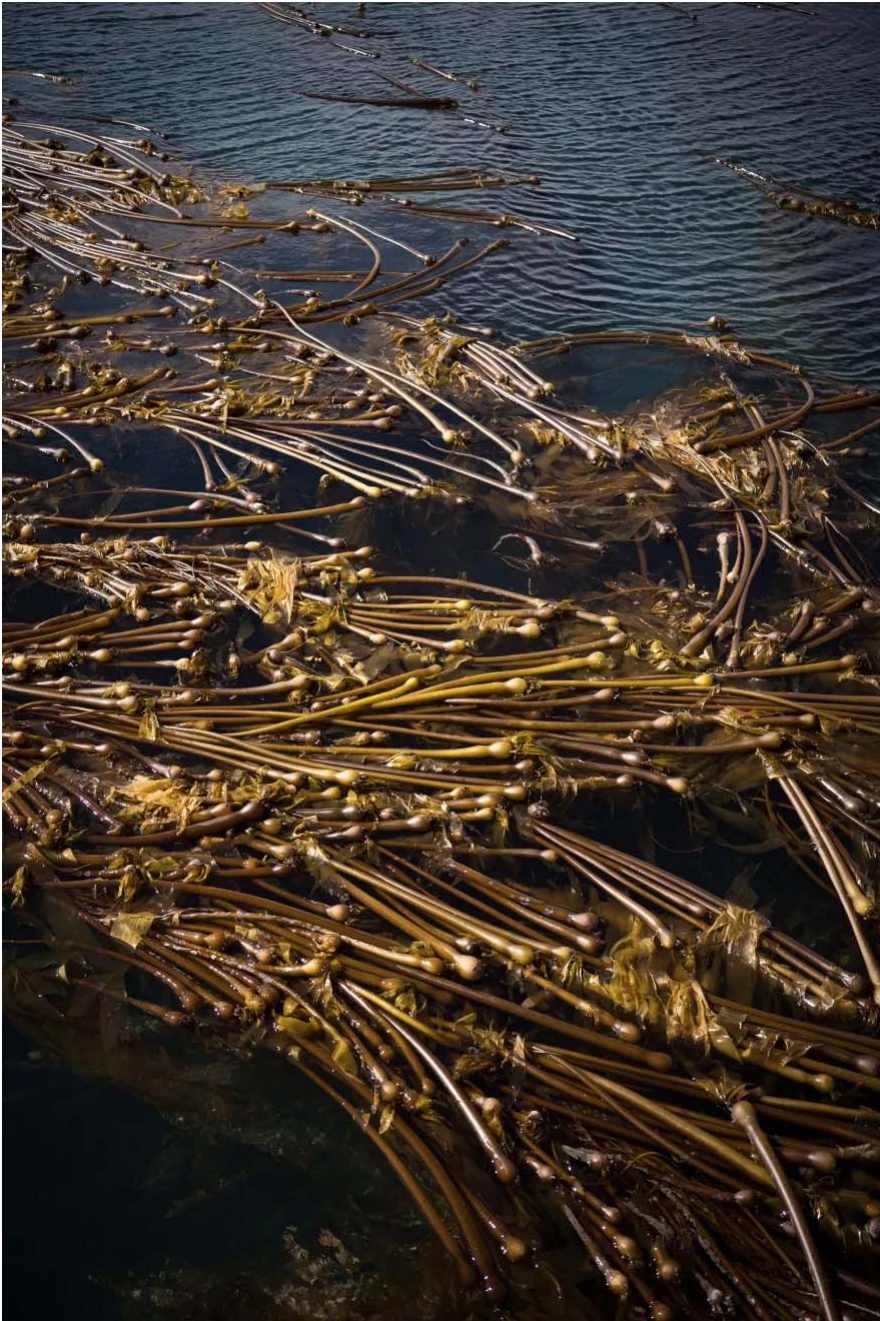
Fireweed petals grace the tops of kelp pickles made by Juneau-based company Barnacle Foods. Photo courtesy of Barnacle Foods.



Matt Kern and Lia Heifetz hold one of their company's raw products: bull kelp. Photo courtesy of Barnacle Foods.

Sannito has given Barnacle Foods a clean bill of health and is impressed with the products, both ingredients and labeling.

"They have really nice packaging and the products look appetizing," he added.



Bull kelp floats on the water's surface in Southeast Alaska. Photo courtesy of Barnacle Foods.

The kelp products are currently sold online and in specialty food stores and gifts shops in Alaska. Barnacle Foods is also expanding its reach into the Pacific Northwest and California, including the New Seasons Market chain in Oregon and Washington, food co-ops in the greater Seattle area, and Bi-Rite Market in San Francisco.

The company had earlier operated a mobile storefront in downtown Juneau out of a converted shipping container. But the lot it sat on is being developed, and Barnacle Foods had to move. For now, the owners are focusing on the wholesale business of selling to distributors and stores.



Kelp in a tote. Photo courtesy of Barnacle Foods.

One customer in Anchorage is **Summit Spice & Tea Company** (<http://www.summitspiceandtea.com/>), a popular store and tea café in Midtown.

Owner DeeAnn Apgar features a large table of Alaska-made products ranging from



DeeAnn Apgar, owner of Summit Spice & Tea, displays a variety of Barnacle Foods products, including kelp pickles, on her Made in Alaska table at her Midtown Anchorage shop. Photo by Paula Dobbyn.

sea salt made in Sitka to Alaska umami sauce. At the center of the table, piled high, are stacks of Barnacle Food pickles, salsa and seasonings.

"Alaska is so far away from the rest of the country. It's hard to do farm-to-table here. But products like kelp pickles from Southeast Alaska certainly help bridge the gap," she said.

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Our Vision and Mission

VISION: Alaska will sustain its vibrant marine, coastal, and watershed ecosystems, with strong coastal communities and people who make decisions using science-based and traditional knowledge for the social and economic benefit of all Alaskans.

MISSION: To enhance the sustainable use and conservation of Alaska's marine, coastal, and watershed resources through research, education, and extension.

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With entrenched aquaculture views, Alaska weighs its future in farming

Monday, 1 April 2019

By Lauren Kramer

Blue Evolution, Silver Bay Seafoods ready to carry the 'mariculture' torch in The Last Frontier state



Blue Evolution is producing two varieties of kelp, alaria and saccharina, in Alaskan waters. Photo courtesy of Blue Evolution.

The word aquaculture is a dirty one in Alaska, where finfish farming is firmly prohibited. But if your aquaculture falls within certain limits, permits to proceed can indeed be obtained. Just ask Beau Perry, founder and CEO of Blue Evolution, a San Mateo, Calif.-based company that farms two varieties of kelp, alaria and saccharina, in Alaskan waters.

“We harvested 30,000 wet pounds of seaweed last year and are aiming for 200,000 pounds this year,” said Perry. “To compete we need to increase volume so our costs come down, and Alaska’s great asset is its tremendous processing capacity, giving us room to grow.”

Perry’s main production area is off Kodiak Island, where until recently, two farmers deployed 34,000 feet of line. This year the farmers will more than double their output, to 70,000 feet of line.

Two years ago, Blue Evolution submitted an application for 34 acres on another site near Kodiak, where Perry hopes to produce a new species of kelp, conduct research and development and train other farmers to grow seaweed. Approval can take anywhere between two and three years, but he’s hopeful a positive answer will be forthcoming in the next few months so that operations can begin this fall.

“Some communities, generally the waterfront working towns, are eager to have shellfish and seaweed farms, and both Kodiak and Ketchikan are receptive to the idea,” he said. “It helps that that our business is very complimentary to fishing and that we’re working with fishermen. We’re using labor, boats and processing facilities in the winter and spring, when there aren’t significant fishing operations, so there’s no conflict with fishing income and activities. Fishermen want to work and produce seafood, and they see me as a good fit for their marine economy.”

In 2014 NOAA provided grant funds to the Alaska Fisheries Development Foundation to spearhead the Alaska Mariculture Initiative. “Mariculture” is Alaska’s term for the enhancement, restoration and farming of shellfish and seaweed, and Julie Decker, AFDF executive director, said it’s important not to confuse the two terms.

“The term aquaculture has negative connotations with a majority of Alaskans. Because of the history of Alaska’s public policy debate about finfish farming and resultant prohibition of finfish farming but approval of shellfish and seaweed farming, we wanted to use a word that could help differentiate this initiative from the term aquaculture.”

The two terms are still confused, said Perry: “My permit talks about aquaculture but former Alaska Gov. Bill Walker created the Mariculture Task Force three years ago. In Alaska there’s a real aversion to finfish aquaculture, so when you’re using the word aquaculture in this state, you get very different reactions depending on what you’re producing.”



Producing kelp off of Kodiak Island, Alaska, Blue Evolution aims to grow 200,000 pounds this year. Photo courtesy of Blue Evolution.

The Mariculture Development Plan, whose 20-year goal is to generate \$100 million in overall sales, is hoping seaweed will generate \$15.7 million for the industry in the next 20 years. To Perry, this sounds perfectly realistic.

“Seaweed is much easier to capitalize than other aquaculture species. It requires a lot less investment, is simpler and the organisms are way more resilient,” he said. “We’ll have to diversify into other markets such as animal feed, pet feed and cosmetics to find a market for our seafood, but I think Alaska stands to be a major global production center for seaweed and kelp.”

The MTF is pinning its hopes on geoducks, mussels, king crab, sea cucumbers and oysters. It says oysters could constitute 40 percent of Alaska’s mariculture industry, which would equate to \$30 million. Decker said the total value of species presently being farmed – oysters, blue mussels and seaweed – is \$1.5 million. That figure has grown slowly in the past seven years. In 2012 it was valued at \$500,000.

Another company awaiting permitting from the Alaska Department of Natural Resources is Sitka-based Silver Bay Seafoods, a processor of frozen salmon, herring and squid that applied for a 10-year lease on 182 acres of sea floor near Sitka to start an oyster farm. Tommy Sheridan, external affairs representative for the company, said Silver Bay hopes to have an answer by December 2019, enabling the company to move forward by Spring 2020.

“The biggest obstacle thus far in the permitting review process is a lack of state employees devoted to the significant increase in permit applications that were submitted at a similar time frame to ours,” Sheridan said. “If we get approval, we’re shooting for annual production of 20 million sellable oysters per year.”

The oyster operation would generate 50 full-time year-round positions and would require millions of dollars in capital infrastructure. Additional hatchery facilities may also be required as capacity limits at the existing shellfish hatcheries in Ketchikan and Seward may inhibit the new operation from reaching its full potential.

Sheridan said Silver Bay held a couple of meetings to inform the public about their application and answer questions.

“I wouldn’t characterize the public’s response to our proposed farm as negative – the public was receptive to our answers regarding their interest and concerns. Given the scale of our proposed farm, I believe that such interest is to be expected,” he said.

Is public perception of aquaculture – or mariculture – changing in Alaska? Decker believes it is.

“The Alaska Mariculture Initiative and the Mariculture Task Force are having a positive impact. There have been dozens of news stories and public presentations in Alaska about mariculture in the last few years and we have integrated lots of stakeholders,” she said. “I think this approach takes a lot of effort, but it is working.”

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Global Aquaculture Alliance

Former lawyer starts largest kelp farm in North America

By Cliff White

April 2, 2019



Two years ago, Markos Scheer was sitting pretty. He had a comfortable job working as an attorney at the Williams, Kastner & Gibbs law firm, representing seafood companies and fishermen that operated from California to the Bering Sea. His family was living quite happily in Seattle, Washington, U.S.A.

Then he started learning about the potential of mariculture in Alaska.

Now, Scheer is the CEO of Premium Aquatics, which just received a lease from the state of Alaska on 1 April to open a 127-acre kelp and shellfish farm in Doyle Bay, off Prince of Wales Island, near Craig, Alaska.

"I believe that this is a transformational moment and advancement of the Alaska mariculture industry, which has a great future for sustainable, renewable, and non-extraction based economic development for coastal Alaska and Alaskans," he said.

In an interview with SeafoodSource, Scheer said that after getting increasingly interested in mariculture as a board member of the Alaska Fisheries Development Foundation, which helped to launch the Alaska Mariculture Initiative in 2013, he felt a calling to get more personally involved in the industry.

"I moved to Prince of Wales Island in 1982 with my mother, who was working in reforestation. From 1985 to 1997, I worked for a seafood company in Alaska, and for 20 years, I represented seafood companies [with interests in Alaska]," he said. "All of this fits together. Those interests brought me into the creation of the Alaska Mariculture Initiative, and that's what opened the pathway to starting [Premium Aquatics]."

In a 2014 concept paper, the Alaska Mariculture Initiative concluded the mariculture sector in Alaska could become a USD 1 billion (EUR 892.9 million) industry within the next 30 years. Scheer said by delving deep into the data contained in the report, he saw "incredible potential" waiting to be unlocked.

“The elements are all there for success,” Scheer said. “Coastal Alaska is a perfect place for mariculture. Existing infrastructure – primarily processing plants for salmon – are under-capacity. There are 8,000 fishing vessels registered in Alaska that are only used for a short period in the summer for the salmon runs. And people in Alaska know how to work on boats and use fishing gear.”

Seaweed and bivalve aquaculture – the proposed usage for Premium Aquatics’ farm – is also one of the most sustainable types of seafood production, Scheer said.

“It has such a good message of blending economic development and stewardship. I saw mariculture had this incredible ability to help build an industry that is sustainable and renewable and helps the people and economic development of coastal Alaska,” he said. “I spent a number of years studying it, and I saw there was just this need for someone to go out and do it. Eventually, I started thinking that maybe that guy ought to be me.”

Scheer founded Premium Aquatics in December 2016 and filed for his site lease in April 2017, meaning it took nearly two years to obtain his permit. But getting the state to approve the lease was not the hardest task Scheer had to achieve; fundraising was by far the trickiest part of the process.

“Start-ups are hard. Raising capital is hard. It took a lot of time. I knocked on a lot of doors,” Scheer said. “Everybody thought it was a great idea, but I was proposing doing something that has never done before in a place that has never seen this before.”

Some of Scheer's earliest investors were Jeb Towne and Bob Desautel and his company, Global Seas LLC. Though the capital round closed in December 2018, they joined in the spring of 2017.

“They saw the vision I had for the company and have been great partners, supporters, and were instrumental in helping the company get capitalized,” he said.

Of his other investors, all are familiar with operating in Alaska, which was key for Scheer.

“They had to know what that meant. We’re talking higher costs, the realities of the weather the area often experiences, the distance to market,” he said. “I understood that and wanted them to as well. They’re aware of the challenges and opportunities and they’ve all reached a point where they want to participate in this.”

Now that his lease is in hand, Scheer said he hopes to begin production this year. Scheer said Premium Aquatics will remain the parent company for both the shellfish and seaweed production divisions, while Seagrove Kelp Co. will be the brand that the kelp will be marketed under. At 127 acres, the Premium Aquatics farm is the largest mariculture lease ever issued by the state by a large margin – the previous largest was 23 acres. About 100 acres of the site will be dedicated to growing bull kelp (*nereocystis Luetkeana*), sugar kelp (*saccharina Latissimi*), and ribbon kelp (*alaria Marginata*), making it what Scheer believes is the largest kelp farm in North America. Scheer said his development plan also calls for production of Pacific oysters (*Magallana gigas*) on 27 acres as early as 2020.

Scheer is limited what he can grow by a state law that requires all mariculture products to be indigenous to Alaska. The one exception to the law is the Pacific oyster, which was grandfathered in as it was under cultivation before Alaska became a state.

“These three kelp species grow in significant amounts near our site, so we can grow any of them, and we can grow them to spec. The goal is to find what the end user needs and do that,” Scheer said.

Scheer said his professional legal background helped him clear the complicated path toward starting his farm. He said Alaska’s mariculture laws, which were enacted in 1988, weren’t impossible to navigate, but “could be better.”

“There are always policy things that can be worked on to make the process more efficient and effective, but I think the system is pretty good overall,” he said.

Scheer said a new kelp hatchery is perhaps the most exciting part of the project. The nursery is the result of another law that requires a mariculture company to source seed from within 50 kilometers of the location the farm site. He describes it as a “greenhouse for baby kelp plants,” and it’s being built near Ketchikan in conjunction with OceansAlaska, a nonprofit marine science and seed production facility. Premium Aquatics signed a 10-year-deal OceansAlaska to work with it to produce kelp seed, and Scheer he’s hopeful the project will provide his farm with enough seed to cover his entire acreage.

“We are currently constructing the kelp nursery and it should be operational by June. That will allow us to test our systems over the summer. The goal is to have seeded line in the water starting 1 October,” Scheer said. “All the species we’re growing are annual plants, meaning we plant them in the fall and harvest them the following spring.”

The seasonality of kelp and oyster farming is perfectly timed with Alaska’s existing fishing seasons, particularly salmon, Scheer explained.

“We’re busiest early spring – from early April to early May, which great timing because it’s pre-salmon runs, meaning all the infrastructure – the processing facilities, fishing boats, and fishermen, aren’t engaged at the time and can be used to support kelp production,” he said.

The most difficult challenge Scheer foresees is marketing.

“The global kelp industry is massive – around 30 million tons of kelp is sold worldwide every year. But the vast majority of that is grown and sold in China, Korea, and Japan,” he said. “Domestically, there’s a commodity market for kelp, but the value isn’t as high as it could be. There’s also carrageenan production and kelp meal. Ideally, we can get into foodie circles and market our products as high-end and boutique, which they will be. I’m working on it – there are conversations happening, but I don’t have any product to sell yet, and I can’t sell something I don’t have yet.”

Scheer said that he and his investors have run the numbers many times, and if the operation reaches an appropriate economy of scale, it should be profitable.

“The economics work. We were very thorough in our business plan in doing sound financial analysis,” he said. “Even without counting on future oyster production, there’s a place in there where the economics play out with the kelp, though multitrophic farms with kelp and oysters add to more profitability because of the benefits of them being in the same location – there’s efficiency in doing both products at the same site.”

Many eyes are watching the project to see how it does, Scheer said.

“There’s lots of interest in the economic model, but somebody’s got to go prove it works first, and I guess that’s got to be me,” he said.

Now, as the project get underway in earnest, Scheer said he’s excited for the challenges that lie ahead.

“This is just a such a paradigm shift for Alaska and coastal Alaska. It’s a big challenge. In a way, it’s a culmination of everything I’ve done. And I feel ready,” he said, adding after a pause. “Maybe I am a little crazy.”

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Tommy Sheridan of Silver Bay is looking to diversify the company's operations in Alaska via mariculture.
Photo: OSU

Massive oyster farm part of Silver Bay's push to diversify in Alaska

Silver Bay's oyster farm is part of a broader plan to move away from processing only seasonal species.

by
Rachel Sapin
April 5th, 2019 12:17 GMT

Next year, Alaska processor Silver Bay Seafoods plans to be growing 20 million oysters annually at a proposed 182-acre farm in Sitka, Alaska.



Company profile: Silver Bay Seafoods

[Read more](#)



For the past decade, the company has been buying and processing salmon and herring at its plant in Sitka, but the move into oysters will allow for better utilization of the plant, Tommy Sheridan, the company's director of government affairs, told **IntraFish**.

"When we started in 2007, our focus was salmon alone," he said. "We've since grown, and have been diversifying into different areas, and different fisheries with different species. This farm is a continuation of that maturation."

An oyster farm in Sitka allows Silver Bay to use the plant and local workers for year-round production versus just for the summer salmon season.

"Our investment will be significant in terms of capital infrastructure and employees; it's going to be several million dollars," he said of the project.

Silver Bay has been working on securing a 10-year lease from the state's Department of Natural Resources since 2017, and recently received a preliminary approval for it. **Aquaculture** Fisheries Marketplace Processor Finance Prices
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Sheridan said a large-scale farm is necessary for success in the region, where smaller-scale farms have previously struggled to get off the ground.

He pointed out its production level is not unusual when compared to Taylor Shellfish Farm, the nation's largest oyster producer based out of Washington state, which sells around 36 million oysters per year.

"There is an unmet demand for Pacific oysters, and especially high quality Alaskan-grown Pacific oysters," he said.

Hungry for more oysters, but held back by the past

The process to develop the farm has not been easy, however, with public scrutiny looming over the plan because of Sitka's previous experiences with oyster farms.

In 2010, a non-indigenous colonial tunicate was found at an aquatic farm in Whiting Harbor in Sitka. What followed involved ADFG and partner organizations removing the aquatic farm from the water to reduce the chance of the tunicate spreading outside of the bay, according to an ADFG story on the invasive species from 2016.

Silver Bay's plans have consequently received significant local push back, Sheridan said, which is why the company has made it a priority to engage with members of the public on the lease.

In March, Silver Bay presented its proposed oyster farm in Sitka Sound to the American Fisheries Society Alaska Chapter 2019 annual meeting.

That proposal addressed, in particular, how Silver Bay would prevent invasive species from establishing on the farm site by cleaning broodstock before spawning by scrubbing and bleaching to prevent shell transportation, as well as using a tank of hot sea water to remove growth from oyster trays.

Another way Silver Bay is looking to solve any invasive issues is by mitigating any imported sources related to the project.

The company is looking at sourcing oyster seeds from a hatchery the state of Alaska is currently developing. If that hatchery isn't complete by 2020, Silver Bay is exploring how it can work with Hawaii-based oyster hatchery, Hawaiian Shellfish, a subsidiary of Oregon-based Goose Point Oysters, to obtain high-quality seeds that are already used by farmers in Washington state, California and Alaska.

The company also plans to fabricate all of its infrastructure locally, or if necessary, purchase new equipment, to prevent any chance of importing invasive species.

"We do believe that best practices should eliminate all cause for concern as they relate to our proposed operations, and take these concerns very seriously," he added.

At the moment, the company remains in development phase, he said, with plans to receive permits from the state this fall, and receive a final decision on the lease application by the end of this year.

A growth space for mariculture

For now Silver Bay is solely focused on Pacific oyster operations in Sitka, but Sheridan said the company is following the potential for more kelp production in the state as part of Alaska's push for more mariculture.

Sheridan, who represents Silver Bay on the board of directors for Alaska Fisheries Development Foundation (AFDF), noted the nonprofit's involvement in creating Alaska's Mariculture Initiative, which created a loan fund for businesses interested in developing mariculture in the state, and also laid out a goal to grow matriculate into a \$100 million (€89.1 million) industry in 20 years.



NOAA Names Rubino Senior Advisor for Seafood Strategy

April 29, 2019

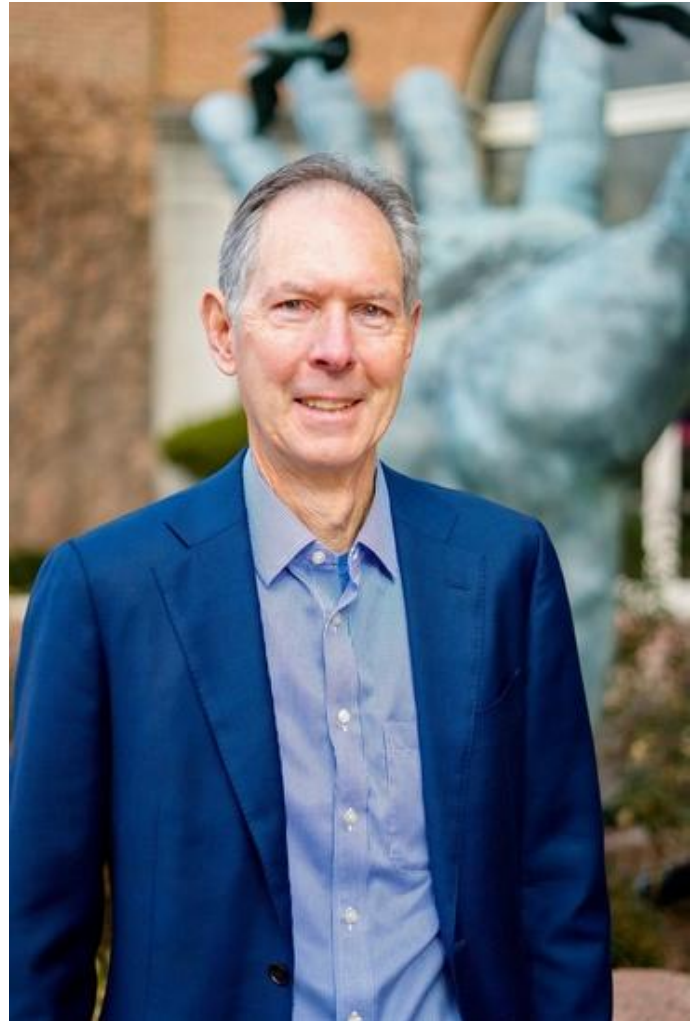
Rubino will lead the development of markets for United States fisheries products and facilitate new and expanded domestic aquaculture production.



Today, NOAA Fisheries announced the appointment of Dr. Michael Rubino as the agency's new Senior Advisor for Seafood Strategy. In this new role, he will lead the development of markets for U.S. fisheries products and facilitate new and expanded domestic aquaculture production.

“We are thrilled that Michael is stepping into this new, expanded role,” said Dr. Paul Doremus, Deputy Assistant Administrator for Operations at NOAA Fisheries. “He has a wealth of experience leveraging partnerships across the seafood spectrum and will now play an even bigger role in the expansion of U.S. seafood production, economic growth, and new jobs.”

Dr. Rubino is well known inside and outside the agency for his leadership, initiative, and ability to develop partnerships that support our national goals of seafood production and sound science. He will have two major responsibilities moving forward: 1) to expand U.S. aquaculture production by partnering with seafood companies, fishermen, seafood farmers, scientists, government agencies, tribes, and others in the adoption of sustainable aquaculture practices; and 2) to help develop new markets for U.S. wild-capture fisheries. He will work closely with the Office of Aquaculture as it continues to lead the agency’s work on aquaculture and the Office of International Affairs and Seafood Inspection as it continues to focus on market access and international trade.



*NOAA Fisheries Senior Advisor for Seafood Strategy
Michael Rubino.*

“As Senior Advisor, Michael will communicate and collaborate with industry leaders, investors, state and federal agencies, tribes, foundations, Sea Grant universities, nonprofits, and the public to develop and expand new aquaculture production,” said Doremus. “He will also identify market opportunities for U.S. fishery products with an emphasis on economic returns on investment and synergies between domestic wild-caught fisheries and aquaculture. With this appointment NOAA Fisheries has positioned itself to more fully engage in every aspect of the value chain for U.S. seafood and aquaculture.”

As Senior Advisor, Dr. Rubino also will work with the private sector and researchers within NOAA and elsewhere to foster innovative aquaculture science and technology development that can provide economic or ecological value for the country; work with U.S. domestic commercial and wild-capture fishing corporations to evaluate what products and services they need from the government in order to increase their contribution to the economy; and collaborate and partner with other federal agencies, coastal communities, states, tribes, the aquaculture industry, non-

governmental organizations, Sea Grant, the councils and commissions, and other partners and stakeholders to transition innovative aquaculture technologies and to document and assess their environmental, ecosystem, and socioeconomic impacts.

"It is an honor to be selected for this new position," Rubino said. "For many years, I've had the great privilege of working alongside seafood farmers, fishermen, scientists, state and federal agency staff, tribes and others to advance science and build partnerships that support America's robust seafood industries. I look forward to continuing this work, and collaborating across agency lines to bolster opportunities for sustainable, home-grown seafood options."

Dr. Rubino has been the Director of the Office of Aquaculture at NOAA Fisheries since 2011, where he led the development of aquaculture regulations for federal and state waters, the National Shellfish Initiative, the USDA-NOAA Alternative Feeds Initiative, a refresh of the NOAA and Department of Commerce aquaculture policies, and the development of new science tools for aquaculture management. Prior to his work at NOAA, he led the development of international agribusiness, environmental, and renewable energy investment funds at the World Bank. Earlier, Dr. Rubino co-founded an aquaculture R&D company with operations in South Carolina and the Caribbean and was a partner in a shrimp farm in South Carolina. He holds a Ph.D. in natural resources from the University of Michigan.

David O'Brien will serve as Acting Director of the Office of Aquaculture while we begin the search for a new permanent director.

Last updated by Office of Communications on April 29, 2019

Emerging mariculture industry seeks to streamline permitting

By: Elizabeth Earl (/authors/elizabeth-earl),

For the Journal

Post date: Wed, 05/01/2019 - 8:56am



Oysters grow in stacked cases in Hamilton Bay near Kake. Boosters of the mariculture industry in Alaska tout the vast potential for the economy by developing more farms for oysters, geoducks, kelp and even biofuels. (AP Photo/File/Capital City Weekly)

Alaska may be famous for its wild fish, but some are working to make room in the state's waters for more shellfish, kelp and crabs on aquatic farms.

Mariculture is a hot topic in fisheries right now. Essentially, mariculture can be defined as the cultivation of plants or animals in controlled saltwater environments, but in Alaska it doesn't include finfish, as that's illegal in the state. So mariculture farmers have stuck to primarily kelp and oysters so far, but they're starting to get more adventurous.

As of December 2018, 58 aquatic farms were operating in the state along with five hatcheries and seven nurseries, though only 41 of the farms documented production in 2017, according to the Alaska Department of Fish and Game.

Oysters are still the most widely grown product, though kelp is gaining ground; after the first operations for kelp were permitted in 2016, four farms had produced 16,570 pounds of ribbon and sugar kelp by the following year.

A major obstacle remaining, though, is the regulatory hurdle to get an aquatic farm permitted. A bill in the Legislature — House Bill 116 — would trim down some of that procedure with an eye toward getting more operations out the gate.

The bill, sponsored by representatives Andi Story, D-Juneau, and Jonathan Kreiss-Tomkins, D-Sitka, would fast-track permit renewals for farms in good standing for their first renewal cycle, which covers 10 years.

Advertisement

Story clarified in a hearing before the House Fisheries Committee on April 23 that it would make no changes for salmon hatcheries, which operate in the state largely without saltwater net pens.

There's been a recent surge in license applications to the state for aquatic farms, increasing the wait time, Story said.

"Because of the recent increase in the number of aquaculture farm leases ... it now takes on average 18 months or more to approve an aquatic farm lease," she said.

To obtain a permit, the applicant first has to apply to the Alaska Department of Natural Resources for the use of the tidelands, which requires a 30-day public review and comment period and may require a site survey by ADFG.

After the public comments are compiled and evaluated, DNR and ADFG issue a final decision. If the permit is denied, the applicant can appeal; if it's approved, the permit is good for 10 years. The DNR permit's annual fees are \$450 or \$875 for the first acre and \$125 for each additional acre, with a \$2,500 minimum performance bond required and a commercial use requirement by the fifth year with \$3,000 per acre or a \$15,000 max per farm site.

ADFG requires an annual operating report for each species cultured as well as permits to acquire and transport wildlife. On top of that, to harvest and sell food products, the Alaska Department of Environmental Conservation requires that the operator obtain a water quality classification, conduct shellfish sampling for paralytic shellfish poison and obtain shellfish processing permits, according to documentation submitted to the Legislature.

It can be expensive and time-consuming. Meta Mesdag, co-owner of Salty Lady Seafood Company in Juneau, told the committee members that it's taken about \$150,000 of investment so far for her family's approximately 1-acre operation growing geoduck clams and oysters.

“(Oysters) take about three years to grow, and the geoduck will take seven,” she said. “Unfortunately, we only have five years left on our lease so we won’t see any revenue from our geoducks before we have to go through the renewal process all over again.”

The Alaska Fisheries Development Foundation, which promotes the exploration and development of fisheries throughout the state, credited the work of the state Mariculture Task Force with the growth in interest. In a letter of support for HB 116, the foundation noted that the vetting process for renewing a permit slows down the process for new applicants.

“HB 116 is important step toward efficiently developing a mariculture industry in Alaska,” wrote AFDF Executive Director Julie Decker in the letter. “HB 116 will allow for one renewal of an aquatic farm site through a simpler internal process which does not require public comment, if the lease is in good standing/compliance. However, the second renewal would still be required to go through the extended process similar to a new application.”

The Mariculture Task Force, established by Gov. Bill Walker in 2016 after the Alaska Fisheries Development Foundation obtained a federal grant in 2014 to fund its Alaska Mariculture Initiative, developed a strategy released in March 2018 aiming to make Alaska’s mariculture industry worth \$100 million in the next 20 years. The industry produced about \$1.5 million in sales annually in the state in 2017.

In the future, the primarily revenue drivers would be oysters, seaweed and geoduck clams, with smaller markets in mussels, sea cucumbers and king crab, according to the group’s Mariculture Development Plan.

The primary recommendations the group produced are securing seed supply through hatcheries, passing state legislation to help fund hatcheries through the mariculture revolving loan fund and allow shellfish enhancement and filling several research and coordination positions for mariculture, among other goals.

Alaska is significantly behind the Pacific Northwest in mariculture development. Some farms in Washington operate thousands of acres and employ hundreds of people. Taylor Shellfish Farms, which has been operating in the Seattle area since the 1890s, employs about 500 people and holds leases on more than 10,000 acres of tidelands in Washington.

Some commenters raised a concern about the size of farms in the future. DNR does not currently have a size cap, other than that a farm cannot take up more than a third of the bay or inlet where it is located.

Though the DNR considers risks like navigation hazards when reviewing farm permits, the agency is starting to consider ways to address concerns about farm size, said Christy Colles, who manages the shore leasing program for the Division of Mining, Land and Water, during the House Fisheries Committee meeting.

“These new farms at this magnitude are by and large new to the state,” she said. “We haven’t really had much of a chance to think about how we can address those.”

“Large” is a relative term in Alaska compared to the enormous operations in the Lower 48, said Mark Scheer, who operates Premium Aquatics near Craig, farming kelp and Pacific oysters. Though he said his lease is for more than 100 acres, he doesn’t use all of it at once.

“I think it’s important to recognize that this is a new transition for Alaska,” he said. “The relative scale of what we’re doing here is modest at best.”

HB 116 was passed out of the House Fisheries Committee to the House Resources Committee, scheduled for its next hearing on May 3.

Elizabeth Earl can be reached at elizabethearl@gmail.com (<mailto:elizabethearl@gmail.com>).

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Seaweed farmers in Alaska gear up for large haul

By PAULA DOBBYN

May 07, 2019
Tuesday PM

(SitNews) - The largest commercial harvest of seaweed in Alaska is taking place this month.

Blue Evolution, a California-based company that cultivates, harvests and distributes Alaska-grown seaweed, is expected to haul in up to 200,000 pounds from waters near Kodiak Island within the next two weeks. Previous harvests have been a fraction of that size, but, as the mariculture industry grows in Alaska, Blue Evolution is also expanding.



Kodiak Kelp Co. harvesters approach a dock with a load of freshly collected seaweed for Blue Evolution, a California-based company that is expanding its farming operations in Alaska.

Photo courtesy of Lexa Meyer

Working with local resident farmers, the company produces seed from wild seaweed plants and grows them into kelp starts in an onshore hatchery at the federal government's Alaska Fisheries Science Center Kodiak Laboratory. Blue Evolution then supplies seeded string to local farmers who plant them onto longlines in late fall, cultivate their crops during winter and harvest in spring.



A worker helps track seaweed harvests at a processing plant in Kodiak.
Photo courtesy of Lexa Meyer

The company is collaborating with the University of Alaska and Alaska Sea Grant on seaweed research aimed at developing cost-effective cultivation methods for several native species. Seaweed farming is a growing, multibillion-dollar industry worldwide and presents a new economic opportunity for coastal Alaska.

"It suits my family because we set gillnet for salmon during the summer and supplement our income with seaweed farming during winter," said Lexa Meyer, who co-owns and operates Kodiak Kelp Co. with her husband.

Seaweed farming is taking off as a global industry that provides a nutritious, sustainable food source that is an alternative to terrestrial food products that often require lots of arable land, fresh water, antibiotics, fertilizers and pesticides, said Beau Perry, who founded and runs Blue Evolution. Perry described seaweed farming as "regenerative," in that it creates additional nursery habitat for marine fauna, sequesters carbon dioxide and buffers the effects of ocean acidification. Although much of his company's seaweed is grown in Mexico, Perry sees Alaska as an ideal place for aquatic farming to expand.

"There's over 30,000 miles of coastline with pristine waters. The sea-to-table movement is growing as people want to know more about where their food comes from. Alaska is well-positioned to take advantage of this," he said.

Rather than harvesting wild kelp, Perry sees Alaska's opportunity in farming it out of regional hatcheries. It's sustainable that way and does not disturb natural kelp beds which provide fish habitat.

Mariculture, which includes seaweed farming, is still a nascent industry in Alaska, but state officials report a growing number of permit applications over the past two years. The state recently created a mariculture development plan that aims to grow a \$100 million industry within 20 years.

On the Web:

Blue Evolution
blueevolution.com

This article is provided as a public service by University of Alaska Fairbanks, Alaska Sea Grant. alaskaseagrant.org

Paula Dobbyn [paula.dobbyn@alaska.edu] is a writer with Alaska Sea Grant.

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GLOBAL INSIGHTS | PERSPECTIVES

Catalyzing the Blue Revolution: How Investors Can Turn the Tide on Aquaculture

May 08, 2019

By Robert Jones, Global Aquaculture Strategy Lead, TNC and Jason Scott, Co-Managing Partner at Encourage Capital

Key Takeaways

- **Aquaculture is the fastest-growing form of food production and the source of half the world's seafood—and most forecasts project continued growth as the global population swells to 10 billion people by 2050.**
- **Farming seafood is one of the most environmentally efficient ways of producing animal protein, but localized environmental impacts have been a major challenge. New technologies and certain production systems now offer the opportunity to grow seafood with less environmental impact.**
- **A large investment opportunity is emerging in sustainable aquaculture, and TNC has partnered with Encourage Capital to create a guide that reveals how investors can help meet the demand for sustainable seafood while achieving competitive financial returns.**

Seafood is one of the most important food sources for the world's seven billion people—for as many as **three billion people**, it is a key source of protein. That significant demand is

projected to rise as the population adds upward of two billion more people in the next 30 years.

Towards a Blue Revolution

A guide from TNC & Encourage Capital on impact investing in sustainable aquaculture.

[DOWNLOAD THE GUIDE](#)

No wonder then that aquaculture is currently the fastest-growing form of food production—and one that has significant economic, social and environmental implications. The \$243 billion aquaculture industry employs 20 million people worldwide, many of whom live in emerging economies. Aquaculture already supplies more than half of the world's seafood, and most forecasts project continued growth.

An industry and environmental inflection point

But some forms of aquaculture production have a spotty environmental track record. While farming seafood remains one of the most efficient ways of producing animal protein, poor practices have been linked to water pollution, habitat destruction and a range of impacts on wild fish populations.



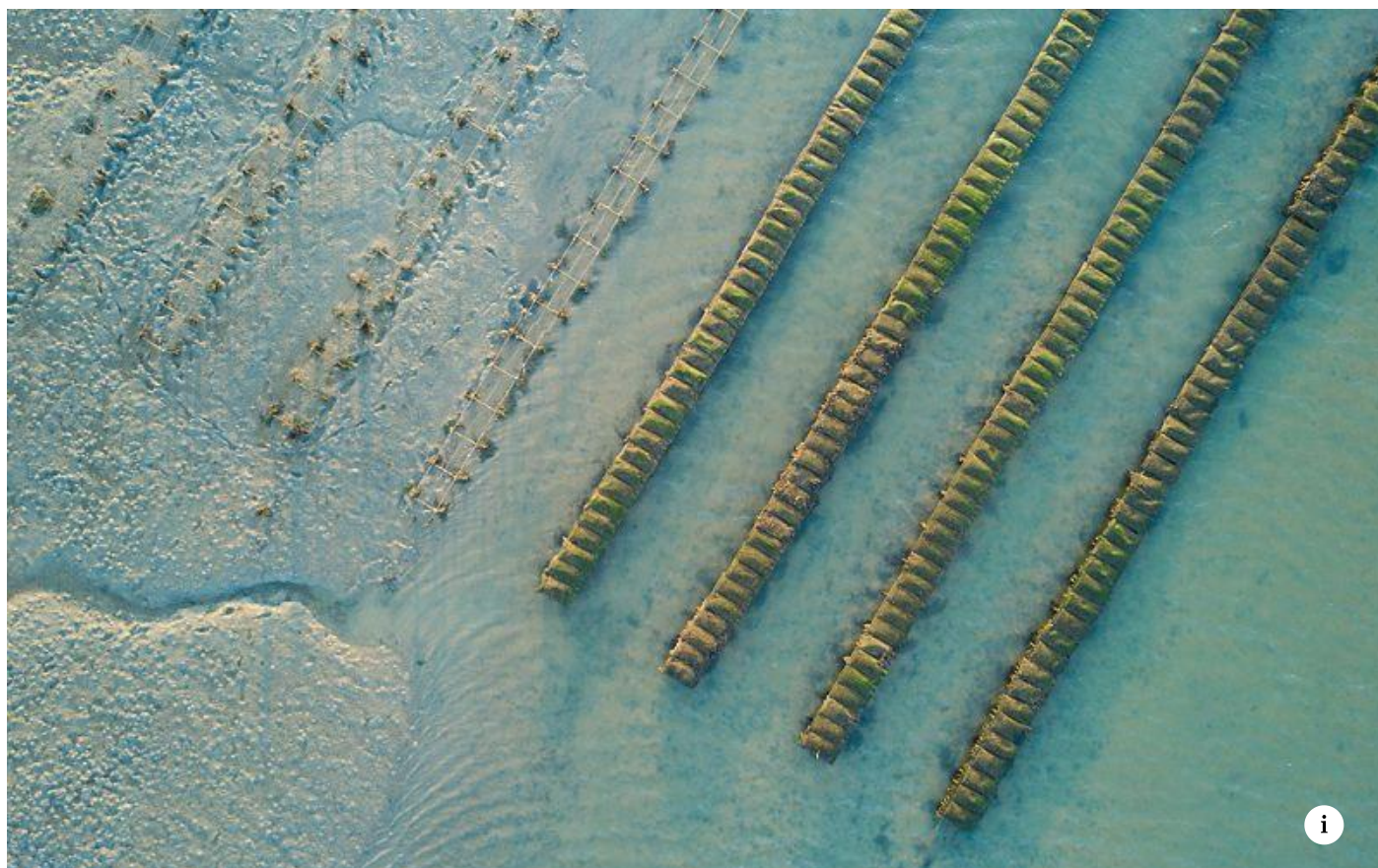
TOMALES BAY, CALIFORNIA, USA Workers at Hog Island Oyster Farm in Marshall, CA on Tomales Bay. © John Terry

Today the industry is at an inflection point. If business continues as usual, the global reliance on seafood could jeopardize marine ecosystems and the livelihoods they support in myriad ways, especially in coastal communities and the developing world. But if we can shift production toward the most sustainable forms of aquaculture production, we can not only foster healthier marine ecosystems, but also a stronger global food system. The key will be how we direct future investments in the industry.

The investment opportunity for sustainable aquaculture

The growth of aquaculture presents an opportunity that is both environmental and financial in nature. Current forecasts suggest producers will need \$150 to \$300 billion in capital expenditures in the next ten years to build out the infrastructure required to accommodate consumer demand.

That means impact investors can steer the future of the industry by directing investments toward the most sustainable forms of aquaculture. Driving additional investment toward these low-impact production methods can help ensure that they achieve commercial scale and become more competitive relative to conventional production systems. Such targeted investments should help catalyze a “race-to-the-top” in the sector and could ultimately set the standard high for governance moving forward.



“

If we can shift production toward the most sustainable forms of aquaculture production, we can not only foster healthier marine ecosystems, but also a stronger global food system.

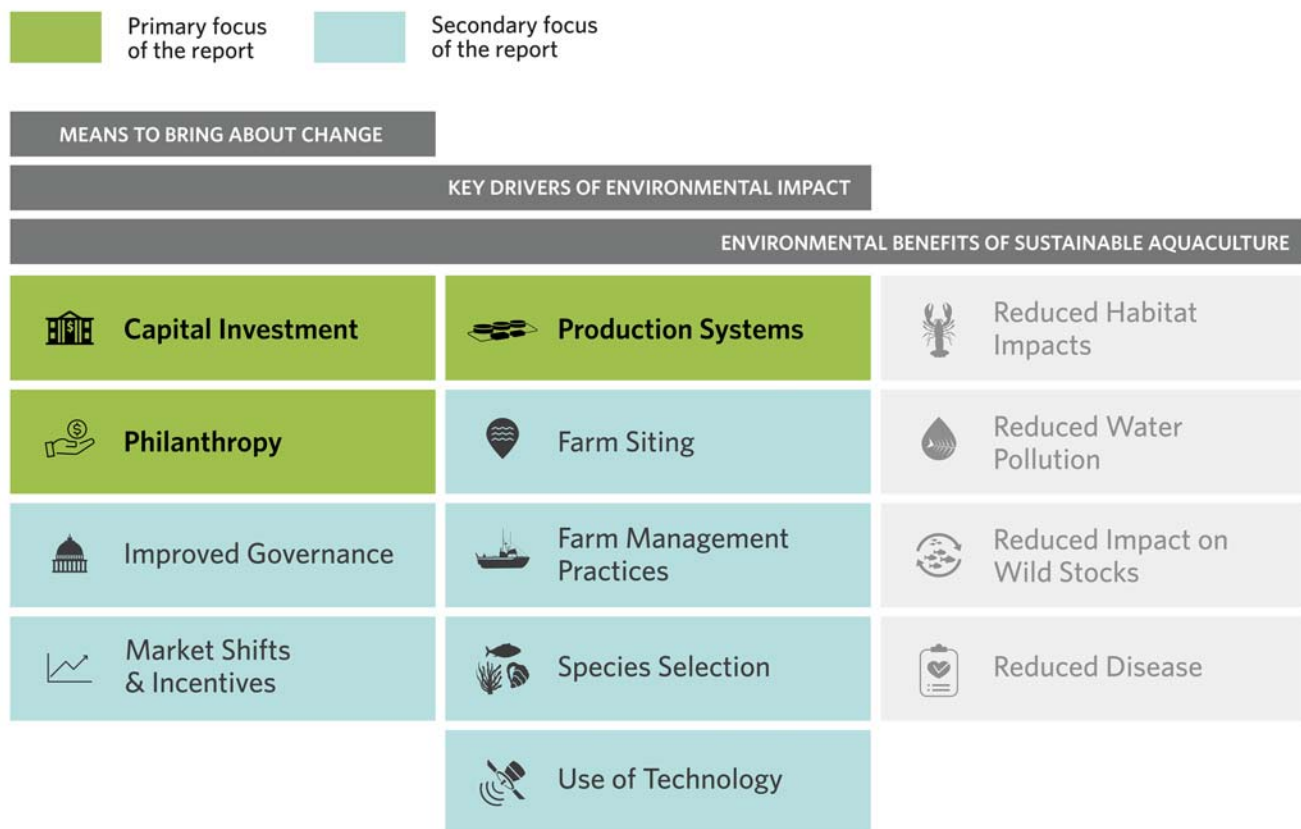
Capitalizing on this opportunity requires two distinct skill sets: the ability to evaluate the environmental impact of different aquaculture production systems, and to assess key

financial considerations and risks associated with each.

What is sustainable aquaculture?

For this reason, The Nature Conservancy (TNC) and Encourage Capital have partnered to create [a guide to impact investing in sustainable aquaculture](#). This represents the first attempt to comprehensively assess this space through a financial and environmental lens. We believe that the industry can help to meet the nutritional needs of a growing global population, while also generating environmental and social benefits, and providing attractive investment opportunities with compelling financial returns.

Sustainable Aquaculture: Impacts, Drivers, and Methods of Influencing Change



Our guide focuses primarily on the production stage of the supply chain—as opposed to innovative feeds, monitoring systems or consumer-facing products (all of which are important for sustainability and will be the subject of future analysis). Production systems

are core to addressing aquaculture's sustainability challenge, so we determined that this would be an ideal starting point for catalyzing the "blue revolution" we envision.

Three key methods of sustainable aquaculture

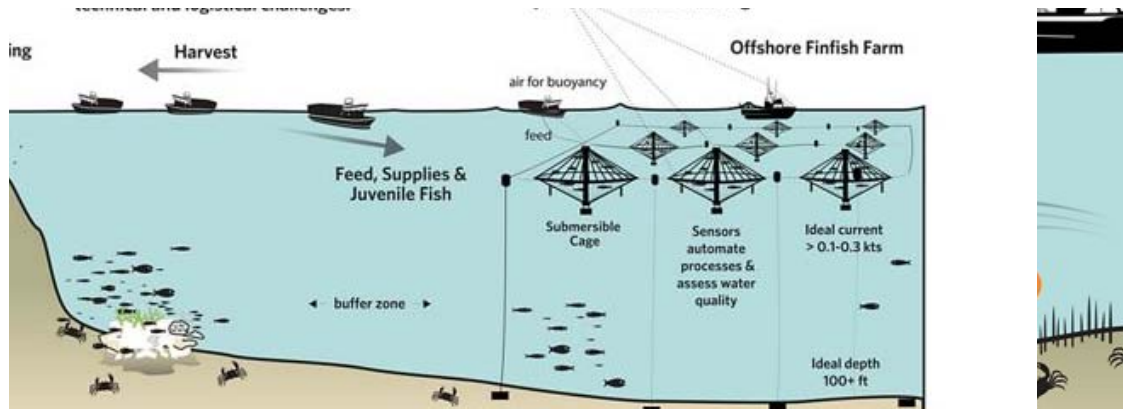
Production systems also represent a unique investment opportunity because of the long-term demand for seafood products and the value inherent in owning a real asset. And while investing in production does carry risks, experience with other emerging technologies such as wind, solar and battery storage has taught us lessons about the optimal way to structure capital for these projects. With all this in mind, we have identified three attractive opportunities for impact investment:

1. seaweed and bivalve systems
2. on-land finfish recirculating aquaculture systems (RAS)
3. offshore finfish systems

Seaweed and bivalves—a category of shellfish that includes oysters, clams and scallops—are an easy sell. Not only do they require few inputs, but each has been shown to have **restorative effects** on degraded habitats by improving water quality, providing habitat for other species and reducing excess nutrients from their immediate environment. The ecological incentives, combined with a growing interest in both species groups for food and non-food uses, create an opportunity to expand production both in scale and geographic scope.

RAS, an on-land farming method, can drive environmentally friendly production by physically separating operations from the marine environment and treating wastewater. While offshore finfish systems like RAS are relatively new, they could avoid many of the impacts that plague near-shore farming by moving activities away from critical habitats and into deep waters with strong currents. And with 90 percent of global wild fish stocks overfished or fully fished, there is hope that these novel forms of fish farming, when practiced well, could create an alternative supply to overfished wild stocks as well as some of the less environmentally responsible conventional aquaculture systems.

3 KEY SUSTAINABLE AQUACULTURE SYSTEMS



1. SEAWEED AND BIVALVE AQUACULTURE SYSTEMS Of the three sectors chosen for deep bivalve production and seaweed aquaculture offers the clearest environmental value proposition. Conservancy

Consumers demand sustainable alternatives

While early RAS and offshore projects have had difficulty competing economically, years of experience are improving these systems and reducing the risks more than investors may realize. Meanwhile, consumers are looking for more sustainable options. In fact, demand for sustainable seafood is **growing much faster than the conventional market**, making for a bright outlook for these novel, lower-impact production methods. For investors with a

longer-term outlook, these farming methods present a compelling opportunity to invest in the sector while helping to shape a more sustainable emerging food system.

All of this adds up to a rare opportunity for impact investing in the truest sense: a chance to generate compelling financial returns while tackling one of the signature challenges of our era—feeding a growing population without degrading the environment.



Towards a Blue Revolution

PDF (40.7 MB PDF)

Download the guide from TNC & Encourage Capital on impact investing in sustainable aquaculture.

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Kelp farming is a growing industry in Alaska. Photo: NOAA

Can Trident jump start Alaska's aquaculture industry?

Seattle-based giant has filed lease applications for two kelp-farming sites in Alaska.

by Rachel Sapin
May 14th, 2019 12:42 GMT

US seafood giant Trident Seafoods is eyeing commercial seaweed farming in Alaska, according to government records that show the company has applied for two leases with the state for sugar kelp, bull kelp and ribbon kelp.

The company has applied for a 25-acre lease in the Cook Bay area of Kodiak, as well as for a 101-acre lease in the Left Hand Bay area of the Aleutians, according to state documents.

Trident was not immediately available to comment on the leases, but its move is yet another example of the state's growing mariculture industry, according to proponents.

The Alaska Department of Natural Resources (DNR) received 16 mariculture applications for 2019, which are being reviewed, the majority for kelp production.

Next year, Alaska processor Silver Bay Seafoods plans to be growing 20 million oysters annually at a proposed 182-acre farm in Sitka, Alaska.

Julie Decker, who heads the Alaska Fisheries Development Foundation (AFDF), credits the Alaska's Mariculture Task Force for attracting major US businesses to the state for something beyond pollock and salmon.

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"It has definitely raised awareness of these kinds of opportunities," she told **IntraFish**. "It gave a lot of people confidence that there's a larger group of stakeholders, including the state, that are coming together to make this easier to do."

Applications for mariculture leases with the state started to see an uptick in 2017, a year after the state formed its task force, according to Decker. The new applications have either been for seaweed, oysters or both, she said.

From 2012-2016, the state received around 39 lease applications, according to DNR. From 2017 to 2018 the state received 33 applications for aquatic farming projects and has, so far, approved six of them.

Ketchikan-based OceansAlaska, a research and training facility which also produces oyster seed for local farmers, is expanding its facilities to meet the growing demand, Fernando Baez, a special projects manager with the nonprofit, told **IntraFish**.

"It's a new area where there's interest from all sorts of people right now," he said.

ANCHORAGE DAILY NEWS

Business/Economy

Alaska's biggest ever commercial seaweed harvest is happening right now

✎ Author: Michelle Theriault Boots ⌚ Updated: 1 day ago 📅 Published 4 days ago



Kodiak Kelp Co's Alf Pryor offloads kombu. (Courtesy Kodiak Kelp Co.)

The biggest commercial seaweed harvest in Alaska history is unfolding this week in waters off Kodiak, one slick blade of sugar kelp at a time.

By the end of the two-week harvest, two Kodiak sea farmers expect to haul in a total of 150,000 to 200,000 pounds of kelp.

This year's harvest is at least three times larger than last year's, said Lexa Meyers, who co-owns Kodiak Kelp Co.

Subsistence seaweed harvests have been happening along Alaska's coastline for millennia. But Alaska's commercial seaweed industry is only a few years old, and growing fast.

Just five years ago there were no commercial seaweed farmers operating in Alaska.

The first applications for aquatic farms growing kelp were issued in 2016, said Cynthia Pring-Ham, the aquatic farming coordinator for the Commercial Fisheries Division of the Alaska Department of Fish and Game.

Today, 16 aquatic farming operations are permitted to culture species of seaweed in the state. Ten have permits to grow seaweed in addition to oysters and other shellfish, six to farm only seaweed, according to Pring-Ham.

It's not just Kodiak.

Lia Heifetz is the co-owner of Barnacle Foods, a Juneau company that produces kelp salsas, pickles and other products.

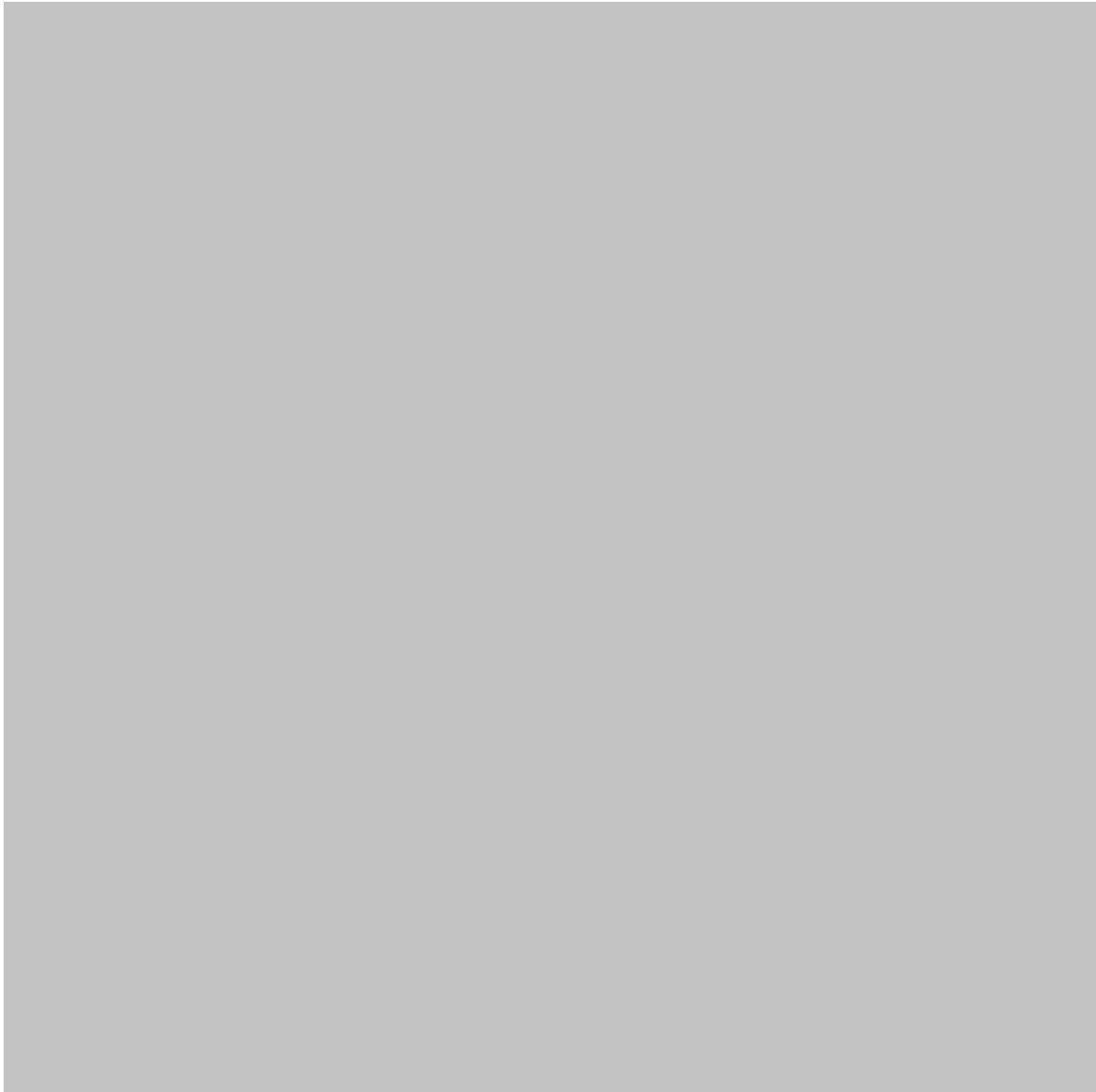
In the past, her company has used wild harvested bull kelp.

But this year they've expanded enough to buy commercially farmed kelp from a growing operation at Hump Island Oyster Company, near Ketchikan.

"(Our business) gave him the confidence to scale his harvest up," Heifetz said. "No one has a desire to grow kelp and have nowhere to sell it. We're at a scale now it made sense for him to make the jump and be confident we can buy it."

Barnacle plans to buy about 25,000 pounds of kelp when the harvest is ready.

"It's a huge milestone," she said.



Kelp pickles. (Courtesy Barnacle Foods)

Meyers of Kodiak and her husband, Alf Pryor, operate an 18-acre seaweed farm a short skiff ride from the harbor.

They grow two types of seaweed: sugar kelp, marketed in Asia as kombu, which grows in wide, flat bands up to 7 feet long. Ribbon kelp, marketed as wakame, is narrower and features a rib that runs the length of each blade.

They sell their harvest to Blue Evolution, a California-based company that has been on the forefront of the developing industry in Alaska.

Worldwide, seaweed is a \$6 billion business, according to the World Aquaculture Society. But most seaweed is harvested in Korea, Japan and China, dried and used for seasoning.

In Maine, seaweed farmers have been producing kelp for food markets for years. But until recently, Alaska had been left out, said Blue Evolution founder Beau Perry.

Starting in 2014, the company worked with researchers at the University of Alaska Southeast to develop techniques for commercially farming kelp -- rather than harvesting wild kelp beds.

The technique involves collecting wild kelp plants and breeding them to produce tiny floating "seeds" that then attach themselves to "grow lines" of string farmers suspend in the ocean in late November, Meyers said.

Seaweed is harvested in late April and early May.

Blue Evolution sells "seed stock" to a handful of Alaska kelp farmers, including Nick Mangini and Alf Pryor on Kodiak, and then buys back the mature kelp.

The kelp is then processed at the Ocean Beauty seafood processing plant and sold as a blanched and frozen product.

So far, the main clientele has been food service at corporations, colleges and other cafeterias.

Alaska kelp can be eaten in a vegan broth at Reed College in Portland, Oregon, and found in the cafeteria of the Bill and Melinda Gates Foundation and Amazon's corporate catering menus.

It isn't available in grocery stores yet, but the company plans to sell a small volume of a dried kelp product used for seasoning on its website within a few weeks, he said.

Perry says it tastes like umami, but without a heavy ocean flavor. Perry likes to use kelp in a wild rice bowl, or in a compound butter. Kelp has made its way into microbrews and sourdough bread.

Alaska is poised to become the center of the commercial seaweed industry on the U.S. West Coast, said Perry.

What would it take to grow Alaska's seaweed industry?

"The development of a market. Right now there isn't any one buyer who could take all the kelp, at this point," Meyers said.

It would also take community acceptance. There's been no voluble pushback to the still-small seaweed farming industry in Kodiak, Meyers said.

"A lot of people don't understand kelp farming," she said. "There's been some concern over people getting bottom leases."

Meyers believes a growing seaweed industry could be a boon to year-round fishing families that live in Kodiak and other Alaska communities. Seaweed farmers use much of the same gear and skills as setnetters.

And the seaweed harvest cycle takes place exactly when other big fisheries are at a lull, in late fall, winter and spring.

“There’s not a lot of opportunities for folks to gain income over the winter months,” she said. “It’s been really nice to see something else creep up.”

About this Author**Michelle Theriault Boots**

Michelle Theriault Boots is a reporter who covers news and features about life in Alaska.

Comments