

Inspecting the lantern bag.

Eyeballing them, he looks pleased. When his measurement confirms they're 65 millimeters across, Gorman nods. "These are ready for ear hanging," he says.

Gently dropping the lantern net back in the water, the crew motors further out, where 2,000 larger scallops are hanging on 26 longlines. The crew hauls up a line with dozens of larger scallops, hanging in pairs by their "ears," the flat wings that fan out from the base of the shell. The animals that emerge from the water are lively; they're snapping and gurgling, coated with algae and a smattering of barnacles.

Gorman measures again. These scallops are on target for harvest in the fall, which means that Bangs Island Mussels will be one of the first companies to bring a mature, environmentally friendly, farmed sea scallop to market in the U.S.

Aquaculture, the farming of fish and shellfish, now provides more than half of the seafood we eat, and the vast majority of that is imported. Despite the [rise in domestic oyster, clam, and mussel farming](#) in the U.S., scallops have yet to cross over from being seen as a wild food to a farmed species. But that could soon change, thanks to an old friendship born from an ancient shipwreck.

A Unique International Partnership

Nearly 120 years ago, a sailing vessel from Maine was wrecked in a typhoon offshore of Japan, in Aomori Prefecture. Japanese villagers there heroically saved four of the 23 crew members from drowning, and their valor sparked an enduring relationship between Maine and Aomori. That friendship blossomed in 1994 into a [formal sister-state partnership](#) that has led the Japanese—the world's largest exporter of this delicate seafood—to share their novel ear-hanging technique with bivalve farmers in Maine.

And while it's still early days for sea scallop farming in the U.S., Maine fishery experts believe it offers enormous potential for diversifying the state's fisheries, as the Gulf of Maine grows warmer, putting the state's lucrative [lobster fishery at risk](#).

"Maine is a one-horse town when it comes to marine landing and value," says Dana Morse of the University of Maine's Sea Grant, adding, "diversification is a wise idea because it adds economic strength and resilience."

Lobster accounted for [76 percent](#) of Maine's value in seafood landings in 2017, or some \$433 million. Scallops, in contrast, contributed less than [1 percent](#) of the state's seafood harvest in value. Scallop meat sold for nearly triple the price of lobster last year, but the harvest was tiny: 793,000 pounds of scallops, compared to lobster's 110 million pounds.

But that's where Morse sees opportunity. He's been at the forefront of efforts to cultivate scallops in Maine since traveling to Aomori on a delegation in 1999, when he says he became "pretty passionate" about the bivalves.

The market potential is huge. Take New Bedford, Massachusetts, arguably the capital for Atlantic sea scallops in the U.S. For 17 consecutive years, it has ranked as the [highest-value fishing port](#) in the U.S.—

outranking even Alaska's top ports—because of its lucrative wild scallop fishery, which earns on average \$12 per pound.

“Scallops are a highly sought-after species,” says Hugh Cowperthwaite, fisheries director at the Portland-based nonprofit development financial institution [Coastal Enterprises, Inc.](#) (CEI). “We’re still importing scallops from other parts of the world to satisfy demand here.”

Cowperthwaite traveled to Aomori in 2010, where he too caught the scallop bug. He’s been a galvanizing force ever since, collaborating with Morse and others to develop a farmed sea scallop using the Japanese ear-hanging technique. Now, with Morse’s 20 years of research and experimentation, CEI’s economic development assistance, and Bangs Islands Mussels’ entrepreneurialism, Maine is poised to introduce a new product to the market.

Scallop Cultivation Requires Time, and Money

At Bangs Islands Mussels’ waterfront facility in Portland, Matt Moretti, the youthful co-owner, says that scallop farming dovetails with the company’s mission of producing fine seafood using environmentally sustainable methods.

Bivalve farming has a smaller environmental footprint than other animal protein production, and is generally more sustainable than finfish farming. Not only can scallops, clams, mussels, and oysters grow without an external feed source—meaning they don’t deplete wild fish stocks like many species of farmed fish, or require corn and soy like livestock—they’re also filter feeders that clean the water as they grow. “Some say they’re regenerative species; they actually help the environment rather than hurt it,” says Moretti, who has a Master’s degree in marine biology.

Moretti explains the three stages of scallop cultivation: collection of the wild seed, or “spat” (baby scallops); nursery cultivation in lantern nets out in the bay; and finally, ear hanging on a long line. The entire process takes about three years.

Moretti doesn’t collect spat, but relies on another fisherman, Nate Perry, to provide him with wild scallop seed. Therein lies one of the biggest challenges to scallop farming. Sea scallops are difficult to grow in a hatchery, and seed collection is a 9-month process. Mesh collection bags the size of a pillowcase are set out in the bay in the fall and retrieved in the spring. That means an aquafarmer has to plan nine months ahead.

The nursery phase is the most straightforward, and similar to the farming of mussels or oysters. The lantern nets need to be power-washed several times over the summer to ensure that the animals can access nutrients carried by ocean currents. Other than that, nursery scallops essentially take care of themselves.

Ear hanging is the most labor intensive and costly phase of sea scallop cultivation; yet, it’s critical because as the bivalves grow larger, they don’t do well in cages. They need a lot of room to move around to filter nutrients from the water and avoid inadvertently slicing each other, explains Moretti. Hanging them on lines also helps develop the delectable part of the animal that’s commonly eaten, the round, succulent adductor muscle that opens the shell to feed the animal.

Specialized machines are required for ear hanging, including a grader that sorts the animals by shell size and a drill to make the tiny hole in the shell's ears. Once they're hung on lines, the individual scallops need cleaning to remove algae and barnacles that can kill the scallops. Japanese aquafarmers have developed a washing machine for this that attaches to the side of the boat. Each ear-hung line is fed through the machine, which is powered by a large water pump on deck.

The combined price for these four pieces of machinery is a whopping \$100,000, according to Cowperthwaite, who bought the machines with funding from [Food and Agriculture Research](#), and leased them to Moretti.

Morse will soon receive his own funding to purchase a set of Japanese ear-hanging equipment that Sea Grant will lease out to fishermen to give them a chance to get familiar with the technique before making such a large investment. Morse counts close to 20 individuals over a dozen farms who are experimenting with scallop aquaculture, mostly by collecting spat or cultivating younger, half-mature scallops.

Bringing Farmed Scallops to Eaters Nationwide

Moretti says he'll sell his scallops this fall to distributors who he already works with, who sell to restaurants and seafood markets. He's confident they'll go fast: "sushi grade," he calls them.

Cowperthwaite agrees. He's tasted the scallops straight off the boat and says, "they're wonderful," though it remains to be seen whether they'll carry a unique farmed-in-Maine flavor.

Cowperthwaite envisions getting the scallops into restaurants, initially in Maine, and getting people talking about them. "You really need to build the story behind it," he says. Once Maine is up and running, they'll look to markets in Boston and New York City.

In time, he says, aquafarmers "will be able to play the world scallop market. If you sell your product in the off-season [which runs from May through November in Maine], you can command a higher price for a fresh scallop coming right out of the water."

No one can say how long it may take a Maine scallop farmer to get a return on a \$100,000 investment because there are still too many unknowns. Cowperthwaite is developing a model to try to answer that question. "We're looking at the labor involved, the grow out time, capital costs of equipment. Eventually we hope to prove that this is a profitable species."

Morse is optimistic. "The machinery seems to work, the animals seem to grow well, the product coming out of them appears to be of the quality that we expect. And we know that the market is very big," he says. "Maine scallops on the global market are about as good as you get."