Oyster cage videos a powerful tool for lessons on shellfish benefits

By Grace Cajski

Over more than two decades of operating Noank Oysters near the mouth of Mystic Harbor, oysterman Steve Plant has seen a wealth of marine life around his oyster cages.

"I have pulled up a cage with 17-inch flukes sitting on top of it. I'd have pilot fish milling around the buoys," he said. During the summer months, he's seen tropical exotics such as yellow tang, juvenile snowy grouper, and butterflyfish.

Chuck Viens, who has operated Charles Island Oyster Farm in Bridgeport and Milford since 2009, has found baby lobsters in his cages.

Mike Gilman, co-owner of Indian River Shellfish and Connecticut Sea Grant assistant extension educator, has spotted blue crabs, seahorses, blackfish, black sea bass and eels when he hauls up his oyster cages.

Beth Simonds, a partner of Stonington Farms Shellfish since 2017, has noticed fish, crabs, eels and seahorses in the cages she and her husband, Kris, keep on their lease area in Groton. The marine life around oyster aquaculture is very rich and often entertaining.

"It's like working in the touch tank of the aquarium all day long and my mom never says it's time to go home," she said. "You never know what you're going to find."

Intrigued by the growers' stories, National Oceanic and Atmospheric Administration (NOAA) scientists at the Milford Laboratory started using GoPro cameras in 2017 to understand how fish interact with aquaculture gear. The small waterproof cameras are mounted to the tops and bottoms of oyster cages, recording eight-minute segments every hour, from 7 a.m. to 7 p.m.

"Our research program is quantifying some of the environmental benefits of shellfish aquaculture, expanding our understanding of how habitat benefits vary over time and space, and whether the farm practices influence habitat provisioning," said Julie Rose, research ecologist and co-leader of the project. "The knowledge gained will aid in ensuring that future aquaculture development maximizes both environmental and economic benefits to society."

As the GoPro Aquaculture Habitat Project forges into its sixth year, NOAA's scientists are analyzing the thousands of hours of video footage they've collected across Long Island Sound. Thus far, their findings confirm the growers' lived experience.

"We see fish of all sizes and life stages using cages as habitat," said Renee Mercaldo-Allen, research fisheries biologist who is leading the project with Rose. "Our findings show that oyster aquaculture cages provide habitat for temperate reef species similar to natural rock reef habitats and that clusters of cages may act like an artificial reef, adding structure to relatively flat seafloor."

Beth Simonds of Stonington Farms Shellfish uses a shell tumbler while working on her company's oyster farm as her dog Max looks on. Photo: Grace Cajski

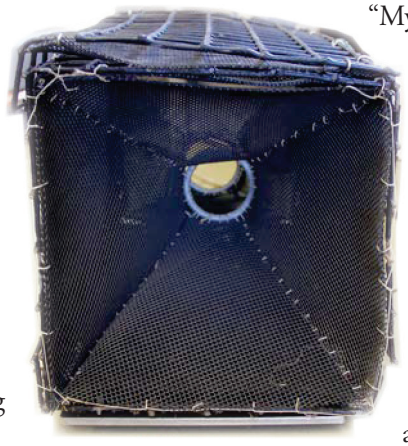
This project wouldn't have been possible without contributions from and collaborations with the state's shellfish growers, who allowed researchers to place study cages on their shellfish leases. As the team has reviewed videos and published their findings, the growers gain quantitative evidence that confirms their lived experience.

Facing page, Dylan Redman, left, fisheries biological technician at the NOAA Milford lab, and Isaiah Mayo, biological science technician at the lab, lower an oyster cage onto the deck of a NOAA vessel to download footage from the attached GoPro camera. Photo: Judy Benson


AEROQUIP

A scup is captured swimming past an oyster cage by one of the GoPro cameras. Photo courtesy of NOAA Milford Lab. Below, one of the oyster cages used in the research project. Photo: Judy Benson

"I think this is the greatest thing ever," said Gilman. "The cages are down there, but you never know exactly how they fit into the environment. The GoPro Project helps give little snippets of how the cages are acting as artificial reefs in that particular habitat…We can say that there are fish swimming around it, but having videos of spawning fish and predatory activities occurring throughout the cages is proof."



It is proof, specifically, that humans can have a positive impact on the surrounding environment.

"Yes, we're putting a piece of metal and plastic in the water," said Gilman. "But it's being productive as aquaculture, it's offering habitat and refuge for other organisms, and it is functioning in the natural environment."

Connecticut Sea Grant's Senior Extension Educator Tessa Getchis agrees with Gilman that these data can shift the dynamics of aquaculture policymaking.

"Having this science-based information is really critical because the growers are empowered," she said. "They can speak up at public meetings, and the local officials who are making decisions can use the information that there aren't any negative effects and that there are benefits to the local environment."

These findings position growers as stewards of the marine environment—a role they already self-identify with. Plant is proud that his oysters provide habitat for other species.

"My best term for oysters is bio-substrate. It's almost like living bottom," he said. "It's bottom that attracts vertebrates, invertebrates, all manner of critters."

By working in cooperation with nature, he believes, he and other oyster farmers are active environmentalists.

"These creatures are filtering the water," he said. "Reducing nitrogen, reducing algal blooms, keeping the water clean, making it more hospitable to submerged aquatic vegetation, all that good stuff. Sequestering carbon in their shell. They are unique in that they're one of the few species where the more you have, the better it is for the environment. It's reverse pressure. It's anti-pressure."

Viens sees his work as a collaboration with nature.

"Having bottom-holding cages is not an environmental problem, it's potentially a solution," he said. "My feeling is that the cages offer refuge from predators."

As such, "oyster farming is about as green as you can get," he

said. “I’m on the side of making it perpetual. I find myself wanting to work closer with the bigger picture.”

Such a sustainability mindset is something that Norm Bloom of Copps Island Oysters in Norwalk has perfected over a lifetime of oystering.

“It’s a gift, you’re given a gift,” he said, referring to each of the oysters he grows. “To be sustainable, now I become a manager. We say, ‘Work with Mother Nature.’ She gives me this, now I have to manage it.”

Like Viens, Bloom has his eye on the long game.

“When I get this resource, the better I manage it, the longer it’s going to last,” he said.

And, being the second of four generations of Bloom oystermen, his management ethos leans towards protectionism. To ensure that there will be enough oysters for his grandson Jack to steward in a couple decades’ time, Bloom considers himself not just a resource manager, but also a resource protector.

Simonds considers herself an oyster caregiver.

“Cozy is my favorite word, and I love making people feel cozy,” she said. “I feel like that with the oysters: they’re little tiny baby bivalves, and I’m giving them a bath and tucking them in.”

Of course, the environmental benefit that the oysters have is not lost upon Stonington Farms Shellfish.

Her husband added: “We’re contributing by cleaning the water.”

Indian River Shellfish’s 11 acres of oysters are also cleaning the nearby water, something that Gilman is proud of.

Sitting on his dock by the Indian River, he gestured to a pile of oyster cages.

“Having 700 of these, the marine environment went from very little shellfish substrate refuge habitat for fish to having a couple million oysters filtering water every single day,” he said.

Shellfish growers are proud of their stewardship of the marine environment, and through the GoPro Project, the public is becoming more aware of their contributions. If a picture is worth a thousand words, how many words is a video worth?

“The videos are meaningful for the public,” Getchis said. “It’s not one image or one video showing one perspective. It’s not just showing the environmental services in terms of fish production. We show the water quality perspective as well. We show reef building as a way to provide services and talk about nutrient mitigation.”

Knowing the power of video footage, the team was intentional about sharing it on its website, as well as through news outlets and social media. The project website’s video footage has already been viewed nearly 17,000 times, project leaders note.

This public reaction has surpassed the researchers’ expectations.

“Video footage of fish interacting with oyster cages has turned out to be a compelling educational and outreach tool to help the public understand shellfish aquaculture and what benefits it may confer beyond producing healthy sustainable food,” said Mercaldo-Allen.

The growers have certainly appreciated the positive press.

“NOAA is helping educate people on the benefits of oystering, through research, through videos,” Plant said. “You have juvenile black sea bass… sheltering up in an oyster cage safe from predators, so what a wonderful thing.

“The more habitat you have, the more biomass you can support,” he continued. “A year-round group of oyster cages can provide regular habitat for all manner of creatures, whether they’re vertebrate or invertebrate, and you can document that through the GoPro study. That’s a good thing.”

Cultivator, one of the vessels used by Copps Island Oysters, is used to harvest oysters in an area near where the NOAA Milford lab is conducting its research. Photo: Grace Cajski

To view the NOAA Milford Lab oyster cage videos, visit: htts://www.youtube.com/watch?v=Yjf8ZVwzrOl