

Mild winter heats up efforts to protect Casco Bay's clams

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Soft-shell clams are a summer tradition around Casco Bay, both for the tourists and residents who love steamers and for the clam diggers who turn long, backbreaking hours on the mud flats into cold, hard cash.

But an infestation of invasive green crabs ravaged juvenile clam stocks in the past four years, adding to ecological changes, competition for coastal access and other pressures facing the state's second most valuable fishery. Clam landings in the Casco Bay communities of Freeport, Harpswell and Brunswick, some of the state's leading clam producers, plummeted to historic lows in 2015, and the scarcity of soft-shell clams contributed to all-time high prices.

While some shellfish managers say clam populations have rebounded thanks to a few cold winters that killed off green crabs, harvesters are anxious that the mild winter this year could produce a resurgence of green crabs and throw the fragile industry into a tailspin.

Those fears have clam diggers and scientists stepping up efforts to defend clam beds with boxes and nets. And they are fueling calls for a sea change in the management of soft-shell clams by leasing clam beds so that clambers can better protect the resource from predators.

Some are sounding alarms that without human intervention, the resource faces total collapse.

"Unfortunately, it doesn't look like people are just going to be able to go out and dig clams like they have without the protection element," said Sara Randall, a Freeport researcher working with clambers in that town.

Others worry about an overreaction. Although most agree that active management and conservation efforts will be required in the future, not all believe the industry is facing a doomsday.

"We realize there is a bunch going on, but we don't see it as the end of wild harvest," said Darcie Couture, a marine scientist working with Harpswell clambers.

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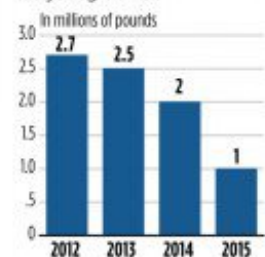
SCARCITY DRIVES UP PRICES

In 2015, soft-shell clams were the state's second most valuable fishery after lobsters. Maine fishermen landed about 9 million pounds of clams, worth \$22.5 million.

The volume of the catch was far smaller than the 20 million to 40 million pounds dug out of the mud each year in the 1970s and '80s. However, the statewide value of the harvest last year was the highest since the state began keeping records in the 1950s because of a dramatic jump in wholesale prices. The average price per pound jumped 47 cents over the previous year, to \$2.46, more than a dollar increase from 10 years ago.

Casco Bay clam crisis

The annual soft-shell clam harvest has dropped dramatically in and around Casco Bay in the past four years, a crash blamed largely on a surge in green crab populations that eat young clams.



Note: Data for 2015 is preliminary and subject to change.

SOURCE: Maine Department of Marine Resources landing data for Brunswick, Freeport, Harpswell, Yarmouth and Scarborough.

STAFF GRAPHIC | MICHAEL FISHER

While that seems like a windfall, scarcity drove the price spike. Clammers weren't bringing in enough marketable clams to meet demand, said Dan Devereaux, Brunswick's marine resources officer.

Far from being seen as a boon to the industry, the high prices were a red flag.

"The fact that they are getting such high prices is alarming, because it signals the scarcity is at a point now where there is not enough clams to meet demand," Couture said.

And while the statewide sales revenue grew last year, the cash flow continued to plummet for clammers in the Casco Bay area.

Freeport clammers landed 288,000 pounds of clams in 2015, compared to more than 939,000 pounds just three years earlier, a 70 percent decline. Despite the higher prices, revenue plummeted too: The value of Freeport clams was \$782,655 last year, half of the value of the 2012 harvest, according to Department of Marine Resources records.

S&S Seafood, one of Freeport's only wholesale clam purchasers, closed its doors last year, citing a drop in business.

"The infrastructure is starting to shrivel now because there is not enough production," said Walt Coffin, a Freeport clammer.

CRABS: A LONGTIME THREAT

The soft-shell clam industry was thrown into turmoil four or five years ago, when an [army of European green crabs](#), bolstered by unusually warm water, overtook the intertidal zone, devouring juvenile mussels and clams and destroying hundreds of acres of marine eelgrass, critical habitat for shellfish larvae. Within three months in 2011, juvenile clam stocks in Brunswick were decimated, according to Devereaux.

For the next four years, communities invested in predator control and resource protection efforts, shielding clam beds with protective netting and trapping crabs by the millions. Those efforts were aided by back-to-back frigid winters that killed off cold-sensitive crabs.

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Although the crab population was knocked down, it wasn't knocked out. Green crabs, which are native to Europe, have been in Maine waters for more than 100 years. In the 1950s, unusually high temperatures also led to a green crab infestation that devastated the soft-shell clam industry until a series of cold winters killed off the crabs.

But with the effects of climate change and a general warming of Maine winters, clammers shouldn't expect annual cold snaps to stave off crab outbreaks in the future, according to Randall.

"The difference between now and back in the 1950s is that we are on a predicted warming track," she said.

Warnings that the Gulf of Maine is on track for another ["ocean heat wave" in 2016](#) – on par with the high temperatures in 2012 that boosted the green crab population – are contributing to that anxiety.



A green crab is pulled from the Harraseeket River. 2014 Press Herald File Photo/Gabe Souza



In a mud flat off Freeport's coast, clammer Clint Goodenow participates in an ongoing study of clam predation. Brian Beal, a shellfish biology expert from the University of Maine at Machias, has been conducting experiments in Freeport's flats since 2013. *Shawn Patrick Ouellette/Staff Photographer*

ADULT CLAMS ALSO FACE PREDATOR

Green crabs are not the only predator expected to compete for the clams this season.

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Huge numbers of milky ribbon worms, a native species that preys on adult clams, started showing up in mudflats in the past two or three years. The worms can grow to 4 feet in length and attack clams through their exposed feet, then devour the entire animal and leave behind an empty shell.

Ian Anderson, the marine resources officer in Scarborough, said clammers started seeing worms for the first time last summer, and it has been a serious concern for the town's 35 commercial harvesters. Scientists don't yet have a clear explanation for the sudden appearance of the worms, let alone any solution to the problem.

"There are guys that have lived in town and dug clams for 35 to 40 years that have never seen them until last year," Anderson said. There is no way to trap the worms and they can tunnel through the mud underneath protective netting for green crabs.

"They showed up all of a sudden and nobody has any real science on how to get rid of them," Anderson said.

ACTIVELY PROTECTING THE RESOURCE

Even if worms are impossible to trap, there may be ways to shelter clams from them.

Brian Beal, a shellfish biology expert from the University of Maine at Machias, is convinced predation is to blame for the decline of soft-shell clams in the Casco Bay region. Beal has run trapping and protection experiments in Freeport since 2013.

Last year, Beal, working with Freeport clammers, installed more than 500 wooden frames covered with different gauges of plastic and wire mesh. The “Beal boxes” are designed so clam larvae floating in the water column can colonize inside the walls where predators can’t reach them. At the end of last season, some of the boxes were teeming with young clams, mussels and other species, and approximately 6,000 immature clams settled in a single box. Nothing was growing in the mud just outside the boxes, Beal said. That proves that while there were plenty of clam larvae, or seed, in the water, only juveniles protected by the boxes survived.

“That is an amazing demonstration of predation,” Beal said.

From the results of his multi-year study, Beal believes that the way forward for clam harvesters is to actively protect the resource using devices like the boxes in privately leased aquaculture sites, or clam farms.

“If you are going to farm clams, you need to have seed,” Beal said. “This is a way to explore, ‘Do I need to buy seed from a lab, or can I rely on nature?’ ”

Chad Coffin, a Freeport clammer and head of the Maine Clammers Association, works with Beal and agrees that the future of clamming is hands-on stewardship of the resource through aquaculture.

“We can’t trap our way out of the problem with crabs,” Coffin said. “The overall message is that we have to find solutions, find practical applications and adapt to changes,” he said.

Part of the challenge is a matter of resources, Devereaux said.

Even though Freeport, Harpswell and Brunswick have strong, funded municipal shellfish programs, the money it will take to protect an entire town’s clam resource just isn’t there. Instead, farmers could finance their own clam farms, which would strengthen clam populations across Casco Bay.

“If you allow individuals to have farms complementary to the municipal program, it will act as a spawning ground for the rest of the region,” Devereaux said. It’s an approach also championed by Coffin, and is being tried out by a [farmer in Georgetown](#).

But for some, the idea of privatizing historically public clam flats is controversial, and Coffin said a proposed farm in Freeport has run into opposition from shorefront property owners who don’t like the appearance of nets and boxes on the flats.

In Harpswell, clammers are looking at collective municipal aquaculture, even though the Department of Marine Resources previously turned down a similar proposal.

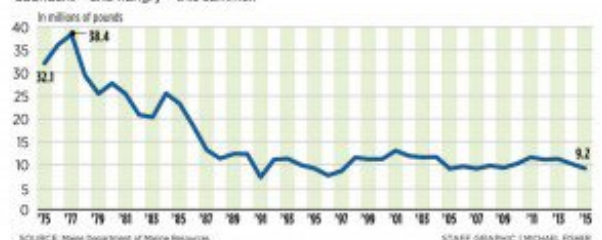
OTHER CHALLENGES FACING RESOURCE

Not everyone agrees predation is the primary cause of declining clam populations.

A [2015 study](#) by the environmental group Friends of Casco Bay found that highly acidic mud flats, partially the result of [rising temperatures in the Gulf of Maine](#), damaged young clam shells and threatened their survival.

Charting Maine's soft-shell clam harvest

Over the past four decades, Maine's soft-shell clam harvest has dropped dramatically and lately plateaued because of predation, regulatory changes, environmental factors and other challenges to the fishery. A mild winter has raised fears that predatory green crabs will be abundant – and hungry – this summer.



Couture, who works in Harpswell, said while predation from crabs and worms is a problem, there are other challenges facing the resource, including ocean acidification and use of the clam flats by [bloodworm harvesters](#) who she said disturb sensitive clam-seeding grounds.

“I think there are multiple factors stressing the natural resource. In some areas it is one thing, in other areas it is another thing,” she said. “I do not believe that predation is the be-all-end-all of stresses on this resource.”

There also isn’t consensus, even within struggling Casco Bay, on whether the industry is in crisis.

Devereaux, from Brunswick, said the population of harvest-sized clams available now is stronger than it has been in years, which could mean a bumper crop this summer. That may be in part because the current crop of clams was able to mature while the green crab population was contained by the severity of winters past.

Brunswick clammers also are diversifying by digging quahogs and razor clams, which are less threatened by predation, Devereaux added.

“I don’t think the shellfish industry is in a crisis, but soft-shell clams are more susceptible to these changes than other species,” he said.

Regardless of disagreements over the cause or severity of the problem, there is a general understanding that soft-shell clams need careful attention and resources to remain sustainable.

“It is a resource that has reached a point where it has to be managed very carefully and looked after,” said Anderson, the marine resources officer in Scarborough.

“It’s still a viable industry.”

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Chad Coffin, a Freeport clam digger, holds handfuls of green crabs off the coast of Freeport 2013 Press Herald File Photo/Gabe Souza



