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Part 2 of a Searchlight series

Conservation concerns complicate rockweed dispute

By Jordan Bailey | Jun 17, 2017

Courtesy of: Aimee Phillippi

Unity College students count organisms living in rockweed during a study conducted at Sears Island in 2011 and 2012.

Preston on bycatch, canopy removal

(Video by: Jordan Bailey)

Phillippi on rockweed study

(Video by: Jordan Bailey)

In the midst of a boom in Maine's seaweed industry, a state plan to improve regulation of the resource and set conservation areas has been put on hold while a lawsuit attempts to settle the long-standing question of whether seaweed is a public resource or the property of waterfront landowners.

A superior court's ruling in the landowners' favor is under appeal at Maine Supreme Judicial Court. If upheld, they could ban seaweed harvesting on their property for any reason, be it to set conservation areas in their own backyards or to guard the algae for their personal use.

Although officially about property rights in the shoreline area between high and low tide lines, the lawsuit was motivated by environmental concerns. A lead plaintiff, coastal landowner Carl Ross, is a former co-director of The Rockweed Coalition, which advocates for conservation of the algae that grows in the intertidal zone and makes up more than 95 percent of seaweed harvested in Maine. The coalition maintains a "rockweed

Phillippi on lawsuit

(Video by: Jordan Bailey)

registry" of landowners who would not allow rockweed harvesting on their property that now numbers 568 landowners in 12 towns.

Maine Department of Marine Resources opposes the ruling, and scientists who developed the rockweed management plan disagree with landowners' alarms about the impacts of harvesting.

Conservation confusion

The Rockweed Coalition is best-known through another former co-director, Dr. Robin Hadlock Seeley, a Cornell University senior research scientist and the university's academic coordinator at Shoals Marine Laboratory in Kittery. Hadlock Seeley has been the public face of opposition to rockweed harvesting in Maine.

"People are really interested in conserving rockweed when there (are) all these other stresses on the ocean and all kinds of habitat loss for other reasons," Hadlock Seeley said in an interview May 15.

"It just doesn't make sense to a lot of people to take away habitat when a lot of other species — commercial and wildlife — depend on (it). It seems as if the landowner should be able to make decisions just the way they would in their own forest to conserve it for habitat, or for their own use."

Hadlock Seeley has been giving presentations around the state at which she argues rockweed should be regulated as a habitat, not a fishery, and sustainability should be defined in terms of ecological impacts rather than how quickly the biomass is restored.

Though harvesting does encourage lateral growth, making for bushier clumps, removal of the upper canopy significantly alters the habitat structure, she said at a presentation in Belfast in 2015, and the effects of doing so are not fully known. Hadlock Seeley suggested it may negatively affect fish and shorebirds, particularly eider ducklings, that feed in the floating upper canopy, and periwinkles, or "wrinkles," a commercially harvested snail that is sometimes found as bycatch in harvested rockweed.

She opens her presentations with a video of periwinkle harvesters, "wrinklers," talking about how the snails depend on the algae.

"So if you remove the rockweed, there goes your clams, there goes your wrinkles, and I suspect it's also protecting baby lobsters maybe," the wrinkler says. "When they take it out of here, what are we doing to the bay?"

But Dr. Susan Brawley, a marine science professor at the University of Maine, who served on the management plan development team and has published more than 60 articles on Maine's coastal marine ecology and rockweed, disagrees with the coalition's points, saying the team and the rockweed working group did consider the ecological impacts of harvesting.

"There are a lot of serious environmental problems in the world and this is not one of them," she said in an interview May 13, during which she referred to Hadlock Seeley as an "activist."

"The idea that you're eliminating the canopy is wrong. The harvesters are working from boats, rocking up and down and moving with the current. It is more like selective cutting. All in all it is the gentlest fishery in Maine because the organisms are not killed and they regenerate quickly."

> "There are a lot of serious environmental problems in the world and this is not one of them." — Dr. Susan Brawley

Brawley said the development team went on a field trip to observe a mechanical harvest. The harvesting devices are designed with the blades set back from the suction head so that much of the algae is left intact. Because the motor is loud and organisms tend to fall off from the vibrations, she said, the bycatch is "essentially none."

The management plan cited a survey in Cobscook Bay from which it was extrapolated that the bycatch of periwinkles in the 2009 statewide rockweed harvest was approximately 0.008 percent of the commercial periwinkle harvest.

Dr. Brian Beal of University of Maine at Machias, who served on both the development team and the rockweed working group that set conservation criteria, said his work and studies he's reviewed show harvesting can occur at the established rates and heights and have "little to no impact negatively on the environment."

Under current department rules that remain in place through the appeal, 16 inches of the seaweed must be left intact above the holdfast, the structure that attaches it to rock. The management plan recommends an annual harvest limit of 17 percent of the standing biomass, but the department estimates that only 1 percent is harvested annually now.

Industry biologists are quick to point to other countries that harvest more. David Preston, staff biologist at Waldoboro seaweed company Atlantic Laboratories, who also served on the management plan development team, said during Hadlock Seeley's Belfast presentation that rockweed has been harvested in places like Ireland for much longer and much more aggressively than in Maine, and with shorter minimum cutting heights, but those countries have not seen the ecological degradation she warns about, and numerous papers show no ill effects of harvesting.

Hadlock Seeley responded by casting doubt on the studies to date. Specifically, she said there has been a lack of before harvesting and after harvesting comparisons of the intertidal habitats.

"Yes, there hasn't been total collapse," she said, "but you wouldn't expect it. You'd expect the impacts to be diffuse and indirect. It's not like you're poisoning the lobster."

Unity professor sees for herself

Prompted by the conservation group Friends of Sears Island, Unity College biology professor Dr. Aimee Phillippi conducted a study of the impact of rockweed harvesting on the ecosystem it supports. She thought Sears Island would be a perfect location for the study because harvesting had not occurred there before, according to her research. She compared the types of organisms living on and in the mud around the seaweed, as well as sediment size and organic content, before and after harvesting.

"I went into it fully thinking there would be major impacts, like with eelgrass and kelp when you remove the canopy, it affects larval settlement and sediment structure," Phillippi said at her office May 10.

In the first year, 2011, after the seaweed was harvested to the 16-inch limit, she found that periwinkles and soft shell clam seed (juveniles) actually increased in number while the invasive predator green crabs declined — a good thing, she said, because the snails and clams are commercially harvested species. She found no changes in any of the other parameters studied.

"I thought, 'Huh, that's weird,'" she said. "I attributed the increases not to a change in hydrodynamics but to a reduction in green crabs."

The next year, with Department of Marine Resources permission, she had the seaweed harvested to 8 inches above the holdfast, and still found no difference.

"It was fascinating because I fully expected there to be an effect," she said.

She realized that unlike eelgrass and kelp that grow in the subtidal zone and are always covered by water, rockweed grows in the more dynamic intertidal zone where crashing waves and ice frequently break or shear the algae off of the rocks. Phillippi concluded that the ecosystem is accustomed to this natural breakage and removal.

When asked about the Rockweed Coalition's arguments about harvesting's impacts, she said she has heard Hadlock Seeley compare rockweed to "old growth forest," and called that a false analogy because of the ice scouring that routinely tears it away.

"Moose Point (in Searsport) was totally scoured bare not that long ago, and if you go out there now, rockweed is all over the place," she said. "It can recover rapidly. That analogy is incorrect and it perpetuates this wrong idea in people."

Phillippi speculated that while some may honestly believe rockweed harvesting is bad for the environment, "there probably are a couple of people who have maybe less pure intentions and that have perpetuated some falsehoods." Such "skewed information," she said, can gain traction among those who consider themselves environmentalists.

"As long as you leave some of it behind, and 16 inches is plenty, harvesting will have no negative effects," she reiterated.

In the course of her work, Phillippi has come to know many harvesters, whom she says she finds to be well-informed and conservation-minded. Many are members of the Maine Seaweed Council, a nonprofit organization dedicated to "protecting the ecosystems of Maine's marine algae," and developing and adhering to sustainable cultivation and harvest practices.

Robert Morse, owner of seaweed company Atlantic Laboratories, is one of them. He said he prefers to call the work "cultivating" rather than harvesting because the algae is trimmed, not removed.

Philippi suggested that there could even be some ecological benefits to harvesting.
Reducing invasive green crabs, for example, is one, and she referred to studies into how the increase in rockweed biomass that results from harvesting can play a role in mitigating ocean acidification.

Dr. Nichole Price, a senior research scientist at Bigelow Laboratory, is currently testing the theory that "enhanced carbon dioxide absorption by harvested rockweed can help remediate coastal environments experiencing acidification."

"In other words," Price said, "it can't solve the global problem, but can have a beneficial localized effect on water quality."

More research needed

All of the scientists we spoke to on both sides of the issue agree that more research needs to be done, and that there should be areas set aside for conservation.

The management plan lists several topics recommended for further study, including the long-term effects of canopy removal, the difference between the recommended 17-percent harvest rate and natural mortality in different areas of the coast, and how much loss/change is too much.

The development team reviewed current scientific literature available and found no evidence of adverse effects of harvesting on fish. One study it cited found no significant differences in the number and weight of fish between intact areas and areas that had been cut to the base where it attaches to rock.

But Phillippi said this is one of "only a handful of studies" on how fish forage in the habitat because of the difficulty of catching and cataloging the fish that swim into the beds during high tide.

Brawley said the development team also reviewed a study on eider ducklings that Hadlock Seeley refers to in her presentations, but found only limited evidence of a negative effect. This was inconclusive, Brawley said, because it was not clear whether the steep slopes in the area had more

of an effect on food scarcity than harvesting did.

“It was questions like those that led the team to recommend the second panel,” she said, referring to the rockweed working group that was establishing criteria for setting no-harvest zones. In that working group’s meetings, the Department of Inland Fisheries and Wildlife provided maps of shorebird islands areas and sites where shorebirds are in decline, recommending areas they wanted to see conserved.

Phillippi, Brawley, Beal and a scientist at Maine Maritime Academy, Dr. Jessica Muhlin, are working on a long-term project surveying rockweed at four sites over time. They are involving students to raise interest among a new generation of scientists to study seaweed habitat.

Brawley said an ironic outcome of the lawsuit is that rockweed is being conserved less than it would have been otherwise because the lawsuit has held up implementation of the management plan.

DMR spokesman Jeff Nichols said if the decision is upheld, the department would continue to regulate rockweed as it is now, by issuing licenses and requiring landings reporting, but he did not say that the new management plan would be implemented or conservation areas put in place.

"The only difference to harvesters would be the requirement to obtain landowner permission to access the seaweed resource in the intertidal (area)," he said.

But this is not the outcome the coalition wanted. Hadlock Seeley said she was disappointed the new rockweed management plan was put on hold. She had attended the rockweed working group's public meetings at which conservation areas were discussed.

“There are many, many lands that people are anxious to see conserved and now nothing is being conserved,” she said. “Not (harvesting) at all is ecologically sustainable and doing it too much is probably not. There is probably something in the middle that is ecologically sustainable, but right now we don’t know what that is. The conservation areas are a hedge against what we don’t know.”

Giving landowners a say, she hopes, would lead to greater conservation. But whether that is an option is a matter for the courts to decide.

Part 3 will look at the legal questions brought up in the seaweed lawsuit.

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