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## Salmon Farming Under Scrutiny

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Its cold waters and strong currents make the rockbound Down East coast, like Norway's fjords and Scotland's lochs, one of the best places in the world to cultivate and raise Atlantic salmon. And, for much of the past 15 years, Maine has embraced the salmon farming industry. Not only has the business been seen as a way to help supply the world with seafood, it offered desperately needed jobs to one of the state's poorest regions. Now the spotlight is on the dirty side of Maine's salmon farms. A federal lawsuit pending in Portland, and new permitting rules under review in Augusta, are raising tough questions about environmental threats such as fish waste, diseases, toxic chemicals and escaped salmon. Some fear the proposed regulatory actions could jeopardize the state's \$58 million salmon farming industry.

Maine is not the first host of salmon farms to take a closer look at what some around the globe now derisively call waterborne feed lots or floating pig farms. Norway banned salmon farms in some areas, and Scotland may relocate them because of impacts on sensitive coastal areas. European regulators recently restricted the use of a synthetic pigment that gives farmed salmon its familiar pink color. And on the West Coast of the United States, in British Columbia and in Scotland, consumers are boycotting cultured salmon and declaring the fish "Farmed and Dangerous" because of both environmental damage and potential health effects.

In Maine, environmental critics say salmon farms have a role in the coastal economy, but that they must be aggressively regulated and supervised to protect a public resource that also supports such uses as tourism, recreation and a \$150 million lobster industry.

"Salmon production is receiving a lot more scrutiny in the major producing counties, partly because improved science is detecting impacts," said Rebecca Goldberg, a scientist with Environmental Defense who has monitored salmon farming. "Some of the concerns people have had are turning out to be true."

Fish farmers respond to the increasingly harsh attention by saying many of the concerns raised in Maine and around the globe are unfounded and aimed at pushing their industry away from valuable coastal properties. If the beef or chicken industries had been treated this way when they got started, they say, there would be a lot less meat on the menu.

"In the last three years, we've put 36 million pounds of totally antibiotic-free protein on the market, and no other protein industry can say that," said Steve Page, environmental compliance manager for Fjord Seafood USA, the parent company to Atlantic Salmon of Maine.

Salmon aquaculture began about 30 years ago in Norway, and the major producers now also include Scotland, Canada and Chile. Maine entrepreneurs began anchoring floating salmon pens in Cobscook Bay in the 1980s, and the 25-foot tides proved ideal for growing the fish. Along with cultured shrimp, shellfish and other products, farmed salmon was promoted as a sustainable way to draw protein from the ocean and relieve pressure on wild fish species driven to collapse by the world's expanding appetite for seafood.

Today, there are 33 active farm sites along Maine's northeast coastline, with the largest occupying 4 acres and containing 1 million fish. All are owned by or affiliated with three companies based in Norway or Canada: Atlantic Salmon of Maine, Stolt Sea Farms and Heritage Salmon.

Farmed salmon is now Maine's second most valuable seafood product after lobster, with farms here producing 29.2 million pounds of the fish in 2001 at a value of \$58.2 million. Maine farms produce the most farmed salmon in the United States - about three times as much as farms in Washington state - but only about 1 percent of the 2.5 billion pounds produced worldwide by the salmon farming industry.

Salmon farming would likely have remained a low-profile enterprise if not for the dynamic nature of the marine environment. "If you put stuff in the ocean, it's not going to stay there," said David Townsend, professor of oceanography and director of the University of Maine's School of Marine Sciences.

The stuff that doesn't stay there, everything from escaped fish to chemicals and waste, is now coming back to bite the industry. Fish waste and excess feed have piled up under salmon pens, in some cases creating dead zones on the sea floor. Pesticides and antibiotics also can fall through the pens into the surrounding waters. Parasites that find ideal breeding conditions in densely packed salmon farms and then spread into the wild have been blamed for destroying the wild sea-trout fishery in Ireland. In Norway, parasite infestations were so bad, the government poisoned dozens of rivers and streams to get rid of them.

The spread of parasites such as sea lice into the wild also has heightened fears about the spread of deadly fish diseases that periodically infect a farm and spread from one pen to another. Infectious salmon anemia, for one, devastated farms in Maine a year ago, although it has not yet been detected in wild fish here.

Even if salmon farms could immediately stop all the discharges, however, their eco-friendly label would still be disputed. Although promoted as a sustainable food source, farmed salmon actually consume more than twice their market weight in herring and other wild

forage fish. The industry represents a net loss in protein from the ocean, a fact that is clearly not sustainable as the industry continues to grow. Farmers, while pointing out that wild salmon eat even more forage fish than the captive salmon, are working to develop vegetable-based feeds that would leave more of the forage fish in the ocean for wild fish to eat. Activists in Canada and Europe have been loudly criticizing the industry for years, but the controversies were slow to reach Maine. Even now, the criticism in Maine and the Northeast is muted compared to the activism on the West Coast and in other parts of the world.

State officials and members of the industry say that's because Maine farms have avoided some of the problems experienced elsewhere. "I think in Maine, being a state that prides itself on its environmental consciousness, we got established in that kind of background," said Page. "We're benefiting from knowledge gained around the world." Page said Maine farms have the most thorough escape prevention systems in the world. State regulators also say Maine is a worldwide leader because of an environmental monitoring program that began more than 10 years ago. It requires testing and visual inspections of the sediments beneath salmon pens, and Maine's strong tidal currents have clearly helped to minimize sea-floor and water quality impacts at most farm sites, officials say.

Maine's industry is not as progressive as it claims, environmentalists say. "There's no question that in Europe, in Norway, they made a lot of mistakes, and we started to repeat the same mistakes here," said David Nicholas, a lawyer for the National Environmental Law Center in New York, which sued Maine's salmon farmers in U.S. District Court. "As we looked into it, they (Maine farmers) don't do a lot of the things that other people do."

Maine farms and state regulators have resisted limits on fish densities and a ban on breeding non-native salmon, even though other producing countries have adopted both, Nicholas said. And unlike Norway and Scotland, Maine is still allowing farms to be located near rivers where

wild salmon return to spawn, according to Roger Fleming of the Conservation Law Foundation in Rockland.

Maine's farms had avoided controversy in part because they are newer to the business and represent a smaller player in the global market. "I think the industry just sprung up here a little later and nobody really focused on it," Fleming said. A favorable regulatory environment here and the receptiveness of Maine officials trying to bring jobs to Washington County were part of the attraction that built the state's salmon farm industry, according to Fleming.

That operating environment is changing now, however. A series of events over the last few years has thrust Maine into the mounting global controversy. In 1999, the federal government formally listed wild salmon in eight Maine rivers as endangered species. The designation is now beginning to translate into restrictions to prevent the spread of parasites or diseases or the escape of farmed fish that might interbreed with wild salmon.

In 2001, the fish farms in Cobscook Bay were struck by infectious salmon anemia, a virus that kills fish and had spread from pens in New Brunswick. The bay was temporarily closed and 1.5 million fish were slaughtered at taxpayer expense, intensifying criticism that Maine's farms were more concerned about quick profit than environmental stewardship.

Last year, a U.S. district judge in Portland ruled that Stolt Sea Farms and Atlantic Salmon of Maine violated the U.S. Clean Water Act by operating without a federal pollution discharge permit. Heritage Salmon had already settled the lawsuit by agreeing to change many of its operating practices.

Judge Gene Carter is now considering penalties against the two companies that could include fines as well as a range of environmental

restrictions. Carter formally warned the companies last week not to place any more salmon in their Maine pens until further notice.

Finally, earlier this month, Maine's Bureau of Environmental Protection held a series of hearings to debate new rules as part of the industry's first Clean Water Act permits.

Proposals would tighten monitoring requirements and environmental safeguards, force Maine farmers to stop using non-North American salmon for breeding, prevent the use of genetically modified fish and tighten up escape prevention measures. The proposals also would require Maine farms to be among the first in the world to mark or tag their fish so that escaped salmon could be traced back to the farm that released them.

Industry officials are fighting some of the rules, including the tagging requirement, saying unnecessary regulations will make Maine farms unable to compete with lower-cost producers in Chile and elsewhere. Environmentalists, meanwhile, say the changes don't go far enough and that even more extensive monitoring and safeguards are needed. Andrew Fisk, an aquaculture specialist with the Maine Department of Marine Resources, said the state's proposal balances resource protection with the benefits provided by salmon farms. The U.S. Department of Agriculture estimates that the Maine salmon industry provides 2,500 jobs and generates \$140 million in personal income statewide. "It's a reasonable way to use state waters and provide these jobs," Fisk said. "Our job is to make sure we've got a healthy and diverse marine economy."

Maine critics of the industry say they have no desire to push the farms out of the state. "I think that aquaculture is a wave of the future as a way to grow food, which is another reason why it should be done the right way," said Bruce Merrill, a Portland attorney and one of the lawyers who won the federal lawsuit.

The spotlight on Maine's salmon farms may lead to more intensive research into the impacts and improve technologies.

Townsend, director of the University of Maine's School of Marine Sciences, conceded that the school has remained mostly on the sidelines as the industry developed here. Now, he said, "we're ready to jump in with both feet" and help determine how many salmon farms Maine's coastal waters can accommodate before the environment is threatened. "That point has never been determined," he said. "Environmentalists would argue we are at the point on the Maine coast. The salmon growers would argue they haven't reached that point yet. Who's right? I don't know, but both points are valid."

According to Goldberg, the Environmental Defense scientist, the problems plaguing the industry around the world could be seen as an opportunity for Maine. "There is no salmon aquaculture worldwide, or at least very little, that is sufficiently ecologically responsible that I would advocate it, but there are ways to do it better," she said. "I think there's room for the Maine industry to actually produce salmon in an environmentally responsible way, and to market their product at a premium."

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