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Rainbow Smelt CPR

Ice-out in Maine's Pleasant River estuary means smelt fishing is on. At least the commercial variety, the kind that comes as a net-gripping counter to winter's release, yielding such abundance, all-at-once, that it's fearful. It's fearful because Downeast Maine's smelt runs are among the largest and the last on the whole Atlantic coast, and nobody knows how long hauls will come. Plenty of smelt are taken recreationally through winter, plunked one-by-one with hook-and-line from dark holes, augured through ice. These harvests are a time-honored rite with their own story, offering a hard-earned reward for many a fisherman's family. But for non-fishing commoners, ice-out means that winter is over, and the promise of an overflowing gillnet is near.

For Maine's coastal communities at this seasonal brink, no other creatures have been so numerous and nourishing. Long before European settlers chanced upon the Pleasant River's fertile estuary, the Passamaquoddy people knew the smelts' annual return as a door to survival, opening to spring. Ever since, ice-out has been a phenological event that locals have hungered for, and climate change has made it a worthy one to record. In 2012, the March 13 breakup was nearly a month ahead of average, but it could not have come earlier for Columbia Falls' legendary smeltman, Sewall Look. As the ice lurched, drivers slowed through town with rubber-necked gazes cast down to the shore. There was no accident. Like the sign of a newly elected pope, they sought the smoke from Sewall's smelt shack, a sign that his wheeling-and-dealing had begun.

With ultra-thin scales and soft, tender bones, smelt are fast-food, Downeast style. After a beheading and quick ventral gutting, the whole body can be fried and devoured, tail and all. My grandfather ate smelt this way in Maryland, though by his Depression-era childhood the best

smelt habitat was being polluted or ripped or dredged out of existence. The Chesapeake Bay had been among the smelt's southernmost ranges, and my grandfather's came in boxes on ice, most likely railed in relay from small towns along the Gulf of Maine.

When I came to work for the Downeast Salmon Federation (DSF), I had no idea the obscure little smelt would so dominate my early spring days. At a mere 6-8 inches, rainbow smelt (*Osmerus mordax*) rarely give cause for "big fish" stories, despite the tiny sharp teeth that try to make them bigger. In fact, when fattening on smaller fish, shrimp, and tiny crustaceans just off the coast from May to November, smelt are nearly forgotten. But come winter, they congregate below estuary's crust, swirling in wait. And then, finally triggered by the early spring freshets and the cover of night, they throng streamward in mighty surges, thousands upon thousands of bodies pulsing just above tideline, to the oxygenated rush of riffles and the rest of still pools. There, on cobbles shaded by a tree-lined shore, their adhesive eggs will cling.

DSF came to realize the smelt were part of a story – a big one – that overlapped with the salmon they had formed to conserve. The story lay in the fact that, aside from their own carnivory, smelt are a forage fish, one of nature's eaten. While juvenile salmon swipe a few smelt in their months of freshwater growth, smelt are vital for post-spawn adult salmon returning to sea in the spring. Having not fed since entering freshwater the summer before, then spawning, then wintering over, these famished "black" salmon turn voracious as days lengthen and temperatures increase. In the estuaries, they too find smelt to be a first food, numerous and nourishing for a journey as far as Greenland.

Sensing these connections, I flinched at the way our organization condoned – and joined – the harvest, fearing our takings would drive both salmon and smelt to the coast's long list of loss. Even though Washington County had 63 percent more terrain than Rhode Island and three

percent of its people. Even though our six tidal rivers were some of Maine's healthiest, lacking major pollutants or large hydro dams. Even then, I feared. The recreational smelt fishery remained open throughout the Gulf of Maine, and the commercial season stayed open in our far corner. My boss Dwayne had petitioned for the Downeast exemptions, even after the rainbow smelt became a federally recognized Species of Concern in 2004. While this term suggested the species was declining and at risk of endangerment, it lacked any formal protections, and I didn't quite feel the concern in it. But in its silence, Dwayne believed that *only* a fishery – a relationship with the fish – could sustain them. A fishery would prove that Downeast Maine was different.

Without knowing why or how it came to be so, the few tourists bold enough to go beyond Acadia National Park could tell you that. When I drove out my first autumn, I felt the difference too; in the pink granite darkening to gabbro, the crimson blueberry barrens rolling on, and on, and on. The land was exposed, yet inviolate, dented only by erratic boulders and towns quarried out of fresh glacial remnants. The stands of spruce and fir were sharp, piercing the sky. If the sky donned cobalt, the rent clouds refracted green on the sea; if gray, nor'easters could fester and whip froth on the clefts. It was all new and old at once, with an elemental palette shading a land more raw and defiant and pure than I had ever known. But at first I could not fathom the strain its towns called normal, or how they would treat the smelt any differently from the salmon. Or the diverse stocks of groundfish – haddock, cod, flounder, and hake – that had been decimated more than 20 years ago, and had stayed decimated, on the coastal shelf nearby.

I'm sure Dwayne knew I smoldered with these thoughts when, in my first season, he walked me down to Sewall's shack. Sewall's was among the few shacks remaining, and standing upright, from the old pictures I had seen. Coupled with the brand-new one that DSF had just built

the year before, the suite of cedar-shake huts bore a nostalgic, postcard glint. "Rob's here to count your fish," Dwayne said as we arrived, ushering me into the dark, smoky hovel. "Brah, they're already dead," cackled Sewall. But Dwayne just warned him not to give me too much trouble, then brought out the egg-slimed, scale-stuck plywood board I'd use to measure Sewall's catch. It had a crook where I'd notch the smelt's nose, then look down the embedded ruler to the tip of the tail. Easy enough. But the shack was tight, and Sewall also wanted to ensure I didn't clog the path for his periodic customers. There were wizened old ladies who extended cash from arthritic hands, but just as many hard-handed townsmen who shook on barter or just came to talk trash with Sewall. As I drew fish after fish after fish from the blueberry totifuls on the doorside bench, I could hear everything but the numbers I tried to record. Every tale between Vietnam and the latest through-the-ice mishap coursed through ears, plus the sporadic grief I got for making the shack too hot. "It's like hell in here," Sewall would holler from his ratty, singed chair by the stove. "Can't you widen that door!"

I didn't remember this being anywhere on my job description, but perhaps I should have taken the hint when, during my interview, I'd been asked about how I would handle a flat tire on a rural night road in a blizzard. "Cell phone service doesn't always work for emergencies out here," Dwayne had added. I muddled through with something about the way my runner's endurance could get me to help in the worst situations, but in the shack there was no running away. I felt accomplice to what Garret Hardin predicted in "Tragedy of the Commons," the seminal 1968 article that proffered how people overuse, and ultimately degrade, the natural resources they hold in common. According to Hardin's logic, freedom was the culprit; rational people try to maximize their own self-interest, but in doing so are blind to the collective ruination they bring. I thought his example of graziers on a pasture was not far off from our

smelt fishermen, each hoping for the big haul, the big sale. Once, I tried to hurl sass back Sewall's way, asking if he worried about depleting the smelt of the Pleasant River. "Aww, she'll never run out," he threw back. I gulped, and kept counting my dead.

There were 80 pounds of smelt that first day. In handling each and every one of Sewall's even 200, I couldn't help getting to know the fish better. When fresh, Sewall told me "they smell like cucumbers," and sure enough, they did. The haul was about seventy-five percent males, the "roughbacks" with stubbly, olive dorsal sides. But that would change in the coming weeks, when more of the females came in – longer, softer, shinier – packed with pasty, mustard-grain eggs. Two of the fish had lamprey lesions, circular suction wounds pocked out from their sides. For the longest fish, I was told to take a few scales from just below the dorsal fin; with a microscope their rings could be reckoned, like a tree's, to track age and condition. But I took far more scales without wanting them, for they clung onto nylon worse than burs onto wool. And some of the eyes popped out in my counting, quicksilver sequins leaking black humor.

Given the state of the smelt, our commercial season was only two weeks long, and that was just fine with me. In addition to counting Sewall's fish, I rowed Dwayne about in his dory to set our own gillnets, listening to him wax poetic about experiments for the perfect mesh-size to reduce bycatch. Catching non-target species is one of the biggest issues any gillnet fishery must face, and there is no doubt that close attention to smelt behavior and size would inspire better nets, used better. These were things I'd always wanted commercial fishermen to do, and I'd come thinking my work for salmon would make "them" do it. But to my surprise, I *was* a commercial fisherman, helping unroll a net that could end hundreds of lives. And I was a pathetic oarsmen for the task, crying my embarrassment into the biting March wind. I wasn't sure if I could handle

it, morally or physically, much longer. We were the only nonprofit conservation group I'd ever known to catch fish with a commercial license for our community fundraiser, a smelt fry.

It was this strategy, this conserve-the-declining-fish-by-eating-it, that left me feeling like a ludicrous hypocrite. But something brought me back the next morning, if not to count, then to pick from the ice-crusting nets on the winding loom. Slowly, my iron purism began to crack. "We can't save 'em if we don't know 'em," Dwayne would say. I could not argue with that, but did we have to kill them? To take them out of the food web forever? I couldn't garner the courage to ask these questions directly, but it was clear that Dwayne didn't see our work as total removal. His attitude was more about the subsistence of communities – both human and fish – and at times, when I'd watch his beaten brow curdle and his steely eyes soften, it bordered on sacrament. One early morning, net-picking in our smelt shack with volunteers, Dwayne drew out a bucket. He told us to squeeze the eggs and milt together, the swirling mass like a punctured omelet, over-easy. "I'll put it back in the river," he said. "Maybe, it'll do some good."

If Downeast communities wished to save their smelt and eat them too, I started to see – in that place, at that time – Dwayne was right: they would have to be different. People would have to believe the river can do good, and believe that if they pay attention to the river, they can be part of its good. In assuming his protagonists were "rational" Garrett Hardin failed to give them feelings or neighbors or places. But the complex weave of the Downeast smelt economy is not solely a "rational" affair. People depend on each other, and such nested knowledge exists because they *care* for smelt that long have been – and still are – a first food of spring. There was a time when packers shipped smelt southward, but most markets gave up on smelt when flashier items like boneless chicken breasts entered the scene. And now, unlike the trophy tourism of

Atlantic salmon or readily exportable, renderable groundfish stocks, a smelt fishery might thrive within the seasonal, local fidelities that lose meaning elsewhere.

In 2012, Elinor Ostrom died. Three years earlier she had become the first woman – and remains the only woman – to receive the Nobel Prize in Economics. Ostrom was no more for big governments than Sewall, but she was an unflagging champion of adaptive governance that empowered communities to make decisions that assured their future. And not just for people, but for the diversity of interconnected resources by which they are sustained. Ostrom won the prize largely for her studies of common pool resources (CPR) like fisheries, forests, or water. Unlike the detached metrics of traditional economic analyses, Ostrom drew heavily on case studies, conversations, and direct inquiries asking questions like "How did you come to establish that limit on the fish catch? How did you deal with the fact that people might try to get around it?"

While Ostrom touted examples of CPR management from the pastures of the Swiss Alps to the forests of Indonesia, she also celebrated Maine's lobster fishery as a success in co-management. U.S. lobster landings had bottomed out at 5-7 million pounds per year in the 1920s and 1930s, and after some restrictions, the annual catch hovered around 20 million pounds until the mid-1990s. The complex scheme of CPR stewardship began to yield inconceivably, peaking at 123 million pounds per year in 2012. Lobstermen had realized their livelihood depended on how well they could compete *and* cooperate with each other. Drawing upon the best available science, they self-restricted entry into the industry, replaced dredging with traps, prevented sale of reproductive females, and protected both juvenile and old lobsters with strict size limits. But most of all, they established a competitive system of zones that each lobsterman felt compelled

to steward and protect. If a lobsterman fished their zone too hard, it would not be possible to be legally re-licensed to a new zone, the lobsterman would have to join the 12-20 year waitlist.

Maine's lobster fishery does not hold the answers for the concerns of the smelt. Ostrom knew that the only thing that never works all the time is a panacea. Lobsters are relatively stationary and graspable, and unlike a gillnet smelt, they can be tossed back if too big or too small. But in all their celebrity at high-end restaurants, we forget that the lobsters' success is also their vulnerability. Historically, lobsters played a far lesser role amidst more diverse fisheries and ecosystems, and their populations have also soared because their groundfish predators have been largely eclipsed. When we forget that fish have lives that are apart from our own, there are times when fisheries must be closed. But when we forget that fish have lives that are a part of our own, there may be cause to keep them open.

In the beginning and the end, habitat will hold that hope. All talk on harvest means nothing without a home where fish can feed, breed, and find safety. For the salmon and the smelt, this means protecting the ocean, the estuary, the river, the stream, the streambank. And, the connections in these places, the process and function by which our watersheds work. By steadily improving in-stream passage and streamside health, DSF is learning why the smelt keep coming. They come for clear waters with cobbles that riffle the flow. They come for cool waters shaded by streambanks alive with trees (and, because any living community of trees includes the dead, they come for woody debris that offers both riffles and shade). They come for real places, like the run of Redmonds Creek (in Harrington) DSF has preserved for these qualities with smelt in mind. We may always struggle to maximize our needs with resources, but Ostrom would tell us that such complexities need not mean chaos. In watersheds, complexity is good. The trick of

our time may be to affirm that resources are not resources after all, but relationships, links of need and love.

When Sewall passed away in 2015, I'm sure he went down proud to be right after all: the Pleasant River has not run out. The fishery outlives him, and his counts have become numbers in history, points in time. Together, they gave DSF a pulse of the river's smelt, and they affirmed Sewall that we cared about his catch. We cared because we didn't want the river overfished. We cared because we didn't understand all that swirled beneath its surface. We cared because Sewall, in his own way, cared too. I knew it the day I found a single tomcod buried among the smelt of his tote. His singular bycatch was admirable, but I knew – or thought I knew – that Sewall would treat the tomcod again as a "trash fish," worth nothing more than bait. Though I'd seen him barter them off with lobstermen before, I couldn't bear the transaction again. And yet, when I told him I'd take the tomcod home to cook and eat, he gave. He was as surprised by my question as I was to ask it, and I knew then – *we* knew then – that our losses and our lives are one.