

FAST FISH, LOOSE FISH

Who will own Alaska's disappearing salmon?

By Rowan Jacobsen



The commercial fishing season on the Yukon River—among the most prolific salmon rivers on earth—usually opens June 15, but last year it didn't. Alaska's Department of Fish and Game monitors the river using sonar and test nets and

*Rowan Jacobsen is the author of, among other books, *Fruitless Fall: The Collapse of the Honey Bee* and the *Coming Agricultural Crisis* and *The Living Shore: Rediscovering a Lost World*, which will be published in September. He lives in Vermont.*

opens the season only after enough fish have passed upriver to their spawning grounds to maintain the population. Although a better-than-average run had been predicted for 2008, by June 15 virtually no salmon had appeared. Or so said Fish and Game. But the 856 Yupik Eskimos living in Emmonak, the village at the heart of Alaska's Yukon Delta, didn't believe it. They thought there were plenty of salmon in the river and that Fish and Game had placed

its nets in poor locations. Each morning fishermen shyly knocked on the office door of Jack Schulteis, the general manager of Kwikpak Fisheries, and asked, "We fishin' today?" "Nope," he told them, and they nodded silently and walked out. They would have to find something else to do until more fish appeared.

As it turned out, when I showed up in Emmonak on what would have been opening day, the replacement project was building coffins. Some-

one had died in the village that week and another person was close to death. On Saturday there would be a Catholic funeral—the Jesuits had brought their religion here in the 1890s—followed by a traditional Eskimo dance to send off the souls of the departed. First the coffins had to be made.

The Yukon Delta is a treeless marsh larger than the state of Louisiana, situated hundreds of miles from the nearest paved road. Goods arrive by barge or bush plane. The only plywood to be had in Emmonak, as well as the only woodworking shop, was owned by Kwipak, the one significant employer in town. So the village elders (a semi-official title in Emmonak, akin to city councilman or alderman) had asked Jack Schulteis if he would donate the lumber and the shop for the day.

Schulteis has white hair, a bristly white chin, and the deepest voice I've ever heard. He holds a lot of impromptu meetings on the wood-pallet stoop outside the tin garage that is Kwipak headquarters, smoking and tapping his ashes into the mud and alder scrub. He grew up in the lower forty-eight, he said, but left for Alaska after being arrested at a 1971 antiwar protest in Washington, D.C., and handcuffed overnight in RFK Stadium, which motivated him to move as far from the center of government as he could get. He worked for fishing companies in the Yukon Delta for thirty-five years and has managed Kwipak since it was formed in 2002. He's known the local families for decades and is running a business that, in one of the poorest towns in America, could easily slide into being a charity operation. "I get calls all winter," Schulteis told me as we sat in his office. "'Jack, they're turning off my power. Can the company give me a loan on next year's catch?' 'Jack, I've got no food.' And now it's coffins. What are you gonna do?'"

Most of the Yukon Delta is a National Wildlife Refuge. Fishing is its only industry. "The salmon are the reason for our survival from day to day," seventy-one-year-old Martin Moore told me. Moore's classic round Emmonak face is distin-

guished by the absence of several teeth. "There's no timber in this region. No gold mining. There's no other potential for earning money. Without the salmon, we would starve." In the 1970s, Shell Oil came poking around but was rebuffed. "The elders came to me after Shell made some offers," Schulteis recalled, "and asked me what would happen if they accepted. 'Well, you'd have more money,' I told them. 'But would things change?' they asked. 'Yes,' I said, 'but you'd have money to buy things you want.' But they said, 'We don't want things to change.'"

But things always change. The Yupik had some control over their land, but the salmon were part of the larger flow of things beyond Emmonak. The town has never fully recovered from what the Yupik call the Disaster Years, 1998 to 2001, when the salmon failed to appear.

Each additional day the season opening was delayed cost the town thousands of dollars and deepened the gloom. There were too many idle hands. Schulteis said they were welcome to make the coffins.

If you compiled a list of the hundred best sites in the Yukon Delta to place a village, the squishy ground of Emmonak would not be on it. The Yupik themselves never thought to build anything more than a seasonal fish camp there. They would catch and smoke king salmon all summer, then in the fall would make the fifty-mile trek to an old volcano that poked through the delta muck, where they could find things like clean drinking water and moose to hunt. That rhythm lasted more or less from the end of the last ice age, when the Yupik's ancestors wandered across the Bering land bridge, until the 1800s, when Russian fur traders came to Alaska bearing smallpox. The Jesuits who came soon after found a ruined culture. They collected the survivors and started the first schools in the area.

In the 1950s, the federal government took over the job of educating the Eskimos. The story goes that government planners had meant to trav-

el upriver to locate a new town on the high ground. But they didn't know how to navigate the shallow Yukon, and their boat kept getting stuck on sandbars. At the site of Emmonak, they gave up. They put up a Bureau of Indian Affairs school and a post office. Houses were hacked out of the alders. In winter some Yupik tried to move to their high-ground homes, but town officials came and dragged the kids back to school. Eventually everyone else followed.

Emmonak is now the largest town for a hundred miles. Nine months of the year it is frozen; the other three, it is a soupy marsh. The houses stand on posts, like women pulling up their skirts to cross a stream. In the 1980s, streets were built out of dredged mud, and they remain the highest ground in town. Haphazard paths of wooden pallets lead from the streets to the houses.

Within a minute of stepping off the bush plane in Emmonak, I was covered in mud. My new Muck Boots, bought for the trip, didn't look new anymore. But they got plenty of attention in town. "I was just looking for those in the L.L. Bean catalogue," said an old man who stopped me on the street. "I bet they're really light." I let him try one on. "Oooh, nice. And warm." Not that long ago, everyone in town would have worn sealskin mukluks. Now they wear plastic waders, except for the teenage girls, who wear Crocs, mud squishing through the holes.

Gordon Westlock, an Emmonak resident in his fifties, remembers his first pair of rubber boots. In the 1960s, some evangelical Christians had tried to start a new church in town but were having difficulty luring the Yupik away from the Jesuits. So they offered free rubber boots to anyone who attended their services. Gordon was twelve. He went. He got his boots and felt very proud. But when he went home, his mother asked, "Where did you get those boots?" He told her. She said, "Eskimos don't wear rubber boots. Get in the boat." She drove him to the mouth of the river, eleven miles away, and pulled ashore. She said, "Get out of the boat." He got out. She said, "I want you to think about who you are," and left. She didn't come back for a week. He

drank the river water. He had no food. But he knew that the mice in the Yukon Delta excavate shelters under the tundra. They dig up roots and tubers, roll them into little balls with mud, and store them in the tiny burrows for winter food. Gordon uncovered these caches by feeling for soft spots in the tundra and ate the "mouse nuts." "I was so happy when they came to get me. I was so hungry." It took him another forty years to come back around to rubber boots.

Others in town have put up less resistance to modernity. Unpainted plywood shacks long ago replaced the traditional sod-and-wood huts. The shacks bristle with moose antlers over the doors and satellite dishes on the roofs. Most of the houses have a dog chained in the yard, but cats are nonexistent. After an evening of whale hunting, the Yupik go home and watch *Dancing with the Stars*, snacking on ptarmigan dipped in seal oil and washing it down with sugary soft drinks.

This town of 200 households boasts 200 boats and 400 snowmobiles, but with gas at \$7.70 a gallon in the summer of 2008, more and more of the vehicles sat idle. There are only a few trucks in town, since they arrive by barge with an \$8,000 shipping charge attached. Midsummer days run in the fifties, the sky eternally obscured by Bering Sea fog. On the rare occasions when the sun comes out and the streets dry, clouds of ATV dust choke the air. Diesel is the predominant smell. No one in Emmonak except the youngest children walks anywhere. When the Yukon River thaws and floods in May, the streets become unusable and residents get from house to house by boat. Icebergs come barreling down the river like runaway trucks.

Nothing leaves Emmonak, and nothing is hidden. The city limits are heaped with refuse. The only way in is the airstrip, which is attached to the town by a quarter-mile of dirt road, and the first thing to greet a visitor is a row of rusty refrigerators lining the road, awaiting final disposal by way of a barge the EPA promised to send three years ago. The town dump follows. Then Emmonak proper: old oil drums and metal shipping containers and rotting wooden fishing skiffs, a grid of electrical wires over everything. Emmonak

would have dissolved into the marsh long ago if it didn't look out upon the best salmon fishing grounds in the world.

Salmon owe their unique color and flavor to their unique lifestyle. They begin life in redds, depressions the females make with their tails in the gravelly bottoms of clear-running mountain streams. The fry spend their first months traveling down their home river, then moving to a brackish estuary and transforming their body chemistry so they can survive the salinity of a marine environment. Then they swim to the ocean, where they feast on tiny crustaceans that are rich in orange-red carotenoids. Salmon are the only fish that store these carotenoids in their muscle fiber, turning it pink. Carotenoids are powerful antioxidants that help protect tissue against oxidative stress, and salmon must prepare for an event of profound oxidative stress: after six months to seven years at sea, depending on the species, at something like ten times their original weight, they return to their natal streams. They make the famous long journey upriver and finally, at the place where they were born, they spawn and die.

By dying, salmon donate their resources to their offspring. The carcasses become food for aquatic insects and freshwater crustaceans, which in turn feed the juvenile salmon, who will also eat their elders' remains directly. And by setting up their young with all the riches of the sea, salmon also spread the wealth around.

The fabulous forests of the Pacific Northwest, for example, were in many ways created by salmon. When the last ice age's glacial fingers relinquished their grip on the region some 10,000 years ago, they exposed a barren landscape. The pulses of salmon wriggling upstream helped engender new life, as if the ocean were impregnating the land. Salmon convey millions of pounds of marine protein to the mountains, fattening bears and eagles alike. Up to a third of the nitrogen on the valley floors of the Pacific Northwest was once salmon, and Sitka spruce along salmon streams grows three times as fast as spruce near non-salmon streams.

Once they begin their spawning run, salmon do not eat. They must swim

upstream all the way to their birthplace, navigating by smell, carrying their fuel with them in the form of fat—solidified oil. This means that salmon born on a long river will have more oil and muscle than salmon born on a short river. And the Yukon River is the third longest in North America, cutting two thousand miles from its mouth at the Bering Sea, past Emmonak and the Yukon Delta, straight through the heart of Alaska, to its headwaters in Canada's Yukon Territory. It is the perfect environment for king salmon, the largest species. Whereas other salmon range between three pounds and eighteen pounds, kings reach forty pounds or more. (The heaviest on record was 126 pounds.) Many kings swim the entire length of the Yukon to their spawning streams in Canada. The most sought-after salmon in the United States is the Copper River king, whose oil content is up to 17 percent of its body weight; the Yukon king tops out at more than 30 percent.

The Bering Sea is one of the few bodies of water on earth that can provide enough food to provision such a journey. Colder seas create an upwelling effect, whereby nutrient-rich deep waters—the marine equivalent of rich soil—rise to the sunlight, triggering tremendous plankton growth. Each spring in the very cold Bering Sea, a favorite haunt of whales and whalers, the melting ice pack retreats like a cloth whipped off a table. This plankton bounty nourishes pollock, salmon, halibut, king crab, marine mammals, and 80 percent of the U.S. seabird population.

Fattened in these rich pastures, the Yukon king is unbelievably succulent. A fillet is two inches thick and slides apart gracefully into huge, glistening flakes. The first Yukon kings of the season can, at \$30 per pound, command more than \$600 per fish in Seattle or Tokyo.

Pull a Yukon king out of a net near Emmonak, just as it is beginning its spawning run, and it looks like a shimmering torpedo, thirty pounds of speckled black back and pearlescent sides alive with pink, purple, green. Like all torpedoes, this one is built for a one-way mission. The nose cone holds the homing equipment, expertly designed nostrils that can discern the waters of

birth from a thousand others, and the sides bulge with propellant; the payload is held underneath. As it powers upriver it deflates, burning oil and muscle in its mitochondrial engines, the fuel gauge hitting EMPTY just as it arrives home, the coloring no longer silver but enflamed bright red, nothing left to do but blow out sperm or eggs over the gravel, give it all to the river, and die a bag of skin and bones. Under ideal conditions—no fishing, lots of food and habitat—about five of a female's four thousand eggs will return to the stream as adult fish.

By the time a Yukon king reaches Canada, the succulence is gone. The First Nations people of the Yukon Territory, however, still base their diets and their economy on the kings, just like the Yupik. But for those kings to reach Canada, a lot of Alaskans must keep their hands off of them. The Yukon River Salmon Agreement, signed in 2002, calls for a minimum of 33,000 kings to be allowed to pass into Canada each year to spawn, and about 25 percent of the total allowable catch must be reserved for the Canadians.

And so it was—until 2007. That June, the Yupik took their legal quota, based on the estimate of that year's run size—35,000 kings to sell and another 50,000 kings to eat. But somehow fewer than 30,000 made it to Canada—not even enough to maintain the population. The Canadians had to cancel their entire commercial, sport, and subsistence seasons. As far as they were concerned, the people on the lower river had stolen their fish.

This situation upsets the Yupik. Dora Moore, an Emmonak resident, was part of a cultural exchange committee that traveled to the Canadian end of the river to see what they do with their fish. "I hated those kings," she told me as we sat in her kitchen dipping biscuits in seal oil. "They were so skinny. So ugly." Fat—whether seal blubber or salmon oil—is the stuff of life in the subarctic, and seeing their beloved kings so emaciated violated the Yupik's sensibilities. Let the fish travel upriver to spawn, sure, but why harvest half-dead individuals that could have been taken in prime condition in the delta? "If you apply common sense to who you are and what

you came from, it's not fair," said Moore. "This is my way of life. Those Canadians up there, their economy is so high. And for them to be doing sport fishing? Who has more right? Do we get caribou right outside our door like they do? No, we get the king right outside our door, and that's what they need to understand. How dare we have that treaty. Where's our natural resource? Where's our tourism? They have other options. They're taken care of. They're *fine*."

"I don't pay attention to seasons," an eighty-four-year-old man who was fishing with his great-grandsons told me as he fired up his outboard and motored upriver, patting the bowl of his belly and smiling. "My stomach tells me when the season opens and closes." Yet other than the octogenarians, not many Yupik risk the fines or boat impoundments that come with being caught poaching.

The real question, of course, is what happened to the fish?

Two Kwikpak employees, Joey Kameroff and Leonard Westlock, who were delivering nets and other supplies to Mountain Village, the nearest settlement, and picking up some tires for the Kwikpak forklift, agreed to show me the river. In our 32-foot cargo boat, the *Emo-10* (*Emos* 1 through 9 litter the junk piles around Emmonak), the 90-mile round-trip required 70 gallons of gas.

Up close the Yukon is brown with silt, but if you skip over it at forty miles an hour in the dreamy light of an Alaskan summer, it looks like an endless plain of beaten zinc. For hours we passed unbroken alder swamp edged in driftwood from the spring floods. Bald eagles loitered on the banks. Hundreds of swans scattered ahead of us. Humans had left almost no mark on the landscape. As we motored upriver we snacked on fry bread that Leonard's mother had made and drank several six-packs of Coke. "I'm addicted to pop," Leonard said.

In the delta the Yukon unbraid into hundreds of strands that weave through the marsh and finally drain, by way of six wide mouths, into the sea. Joey, our captain, knew every creek, detouring down the ones most likely to harbor moose, and every one had a Yupik



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name that stretched back beyond memory. Leonard didn't know the river as intimately and was there to learn the hazards from Joey.

The Yukon constantly shifts its banks. Each channel chews into one bank, caving it in, while laying sediment down onto the other. Alders are ripped into the current on one side, but new ones soon colonize the quiet side, intertwining their roots like protesters locking arms. They capture a few feet of land and then, years or decades later, the water shifts back and tears them apart. The whole delta seemed to belong to some earlier, inchoate form of matter. The spongy land was mostly water, and the turgid river was thick with earth.

Night and day were undefined. The subarctic light never disappeared. The summer sun didn't rise and set so much as boomerang away from a point, spinning high and far, and then come back. Around 2:00 A.M. it slipped below the horizon for four hours, the sky blushed, and then the sun was back.

Joey didn't steer the *Emo-10* down the middle of the river, as I might have, but instead hugged the cutaway bank. "Deepest part," he told Leonard. He slipped into a creek not much wider than the boat. "Stay out of the main channel when the wind is up." Leonard pointed excitedly at a grassy bank. "That's where I shot my first moose!" Later we spotted a wrecked boat on the shore and Leonard said, "My dad and I used to collect brass from that old barge!" I asked him how often he got upriver to Mountain Village. "Second time since I was a kid," he replied. Leaving Emmonak is an extravagance. But later Leonard surprised me by talking about his tour in Iraq and Kuwait with the Alaska National Guard. "We had to find all the 750-pound bombs left over from the first Gulf War and detonate them," he said. "It was cool at first, but it got pretty boring after a while."

We rounded a bend and came upon Joey's younger brother and four other Yupik gathering driftwood. When the Yupik say they are going "logging," they mean they're collecting logs from the riverbanks. Every spring, as the mountain snows melt, the Yukon hulks up, tripling in size, changing color, and raging through the forests of interior

Alaska. Massive trunks wash hundreds of miles downstream and are received by the Yupik, who, before the coming of television, had never seen a forest but gratefully made use of these mysterious gifts of the river. That day, with no fishing to be done, this group was pulling trunks off the riverbanks, lashing them into barge-sized bundles of forty or fifty, and floating them down to Emmonak. I joked with them about logrolling contests, but Joey's brother shook his head. "Man, this river is thirty-eight degrees," he said. "You fall in, you don't come back out. The silt fills your clothes and drags you down."

After decades of ignoring the driftwood, the Yupik are scrambling to convert empty oil drums into barrel stoves so they can burn it. Last winter, fuel oil cost nearly \$5 a gallon in Emmonak, and many families simply couldn't afford the thousand gallons a year needed to heat their homes. Winter temperatures drop to thirty below in the Yukon Delta, and the nights last twenty hours. People had to move in with relatives. Some homes held three families. The Emmonak fire truck was already out of commission because its pipes had frozen and burst after the fire station ran out of fuel. In February, an unlikely hero emerged. Venezuela's president, Hugo Chávez, sent each household in Alaska's Native communities a voucher for a hundred-gallon barrel of oil, courtesy of Citgo—a total of \$8 million in vouchers.

As we traveled upriver, we visited some fish camps. Although the opening of the commercial fishing season was still on hold, the Yupik could fish for their own sustenance during certain twelve-hour periods. "We used to fish seven days a week," one elder told me. "Now they make us fish in these little windows." Smoked salmon is the Yupik's primary winter food; it is a gift given at ceremonies and dances. Any limit on subsistence fishing makes them profoundly uneasy.

Most families spend high summer at fish camp. The typical compound includes a main cabin for sleeping, a smokehouse, an outhouse, a covered pavilion for filleting and air-drying the salmon, and a tiny log cabin for sauna-like steam baths—until recently the

only method of bathing in the delta. The men do the fishing, while the women clean, cut, and smoke the fish that have already been caught. The children help with some tasks but are otherwise turned loose to play along the river to the constant, ghostly sound of snipe in their mating flights.

The Yupik have a word, *slungak*, that translates as "coming to." It describes when awareness first blossoms in a child, when the child stops living purely in the moment and becomes conscious of time and place and self and starts to lay down memories. For many Yupik, *slungak* kicks in when the kings run. All of the adults in Emmonak have vivid memories of their first fish camps.

As we approached seventy-three-year-old Simon Harpak's camp, Joey said to me in awe, "This old man is really tough. He's not scared of bears at all. My father calls him hundred-pound-heart man, because he's so small and so tough." An instant later Joey whispered, "Don't tell him I told you that." With his stature, his round, bald head, and a permanent twinkle in his eye, Harpak looked like an Eskimo Mickey Rooney. The toughness wasn't immediately evident, but it turned out he'd killed his sixteenth grizzly bear—an Emmonak record—just a day ago. The bear had turned up in camp, drawn by the hanging salmon, and Harpak dispatched it before it killed any of the grandchildren wandering about.

Harpak is one of the last surviving Yupik who never learned to speak English. (The Emmonak missionaries used to post signs saying IT IS FORBIDDEN TO SPEAK ESKIMO. Now the schools teach Yupik.) His wife translated our conversation, but his thinking patterns seemed pre-Western. "This month was fast for elders," he said, "but us, we think it's slow. Kings Month was already passing before the ice moved. Now the new moon is here again, and when it ends, the people will be catching chum already." Apparently he was predicting a lousy season for kings but a good one for chum, a smaller species of salmon with less oil. The Yupik look down on chum the way a Burgundy vigneron turns up his nose at Beaujolais, even though some of those chum travel the length of the Yukon to spawn

and actually have an oil content that rivals that of kings from other rivers. (Chum elsewhere spawn near the mouths of rivers and have little oil or market value, partly because the name is synonymous with bait fish.)

This year, Harpak was disappointed with the kings he was catching. "The first king we got looked really good, but it wasn't. It was not fat." I heard this complaint often in Emmonak. The kings were too skinny. Somehow they hadn't thoroughly fattened up in the Bering Sea. Ray Waska, the patriarch of another fish camp we visited, explained the value of fat king salmon: "When you have two or three pieces, you don't get hungry or cold for a long time. In winter, when we're going out hunting all day, we'll have some dry-fish and strips with bread and tea, and that's good enough to keep you going all day."

"Dryfish" is like salmon jerky, chewy and concentrated. "Strips" are long ribbons of salmon, skin left on one side, that are dipped in brine and cold-smoked for two or more weeks. Hanging in the smokehouse, they look like twisted silver-pink tinsel. Thinking of the sushi potential of such rich fish, I asked Ray Waska and Joey if they ever ate it raw, but Joey screwed up his face. "Man, I'm not that native!"

Waska has the biggest fish camp in the delta, and he's been as responsible as anyone for maintaining the Yupik's tradition of smoking salmon. "It's been our main food for generations. Some families may run out in May, but my family, we don't run out. We make sure there's enough for everybody. I have a big family: seven sons—six with wives—plus two daughters and thirty grandchildren. When we get fish, they all come over and help. We all work together and we all share. If we know of some poor family that doesn't have anything, we'll share with them. And elders who can't fish—we share with them too. Sometimes we'll trade with other families who have extra caribou or reindeer, or maybe fresh berries."

Waska was skeptical of the quotas and even of Fish and Game's ability to count. "We need to protect ourselves. There's fish in the rivers right now. People are catching kings north and

south." The sonar used by Fish and Game is at Pilot Station, a narrow neck of the river. One year it showed no salmon at all, despite healthy catches by the Yupik. It turned out the apparatus had shifted and the sonar was pointing into the mud instead of across the river. Many locals told me this story. The Fish and Game employees tended to keep to themselves, in one building at the far end of town, though when they came back from checking their test nets there was always a line of people waiting for them, hoping to get a free fish.

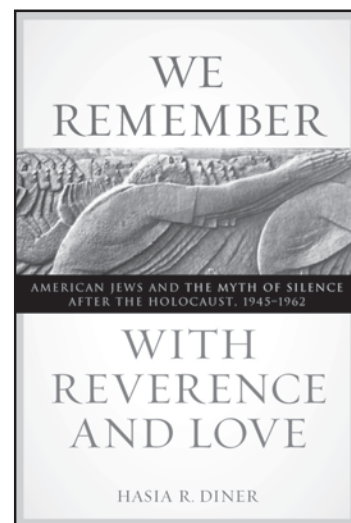
Waska's camp had been built on the bank of the river many years ago but, after the channel meandered away, was now a hundred muddy yards from the water's edge. Every year a few more pallets were added to the trail from the camp to the boats. "Now you see why we call it 'River of Change,'" he said. Then he asked me, "Who do you think is going to win the NBA Championship, Lakers or Celtics?" I'd forgotten that Game Six was that night. I confessed to being a Celtics fan. Waska grunted. "Everyone around here is a Lakers fan. But Kobe can't do it alone."

We pulled back into Emmonak at what felt like midafternoon but turned out to be eleven at night. There were still small children wandering the village and a few men out fishing. I hung a black trash bag over the window in my room in the Kwipak bunkhouse and tried to sleep.

Half an hour later, three seals were spotted on the river. Thirty boats peeled after them, strong Yupik with spears and harpoons bracing themselves at the bows. Every Yupik man has a rifle, but if you shoot a seal in fresh water it sinks. Each spear has a head that sticks in the seal and detaches while a string that connects it to the wooden shaft spools out as the seal dives. The men follow the floating shaft along the surface, then, when the seal eventually comes up for air, they stick it with a harpoon. That night, two of the seals escaped, but the third was hanging in pieces in the village the next morning, its soft auburn skin stretched on a wooden frame.

Until the 1970s, pretty much anyone could fish in the teeming waters of

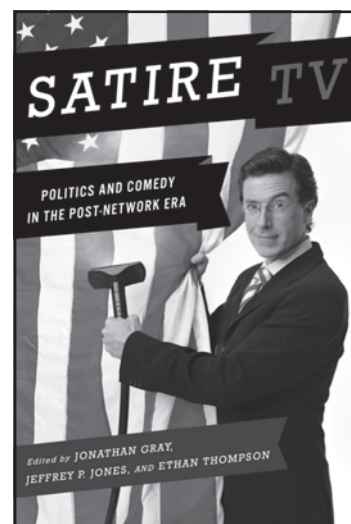
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coastal Alaska. For decades, the area supplied Manhattan with lox. And long before Americans developed a taste for fresh salmon, the Japanese were combing the Bering Sea. All they had to do was stay seven miles offshore, at the edge of territorial waters, and that was all they stayed.

"I remember flying over the Delta and looking down," Schulteis told me one afternoon back at the Kwikpak headquarters. "You'd have thought there was a little city out on the water. A Japanese mothership is 400 feet long and has a dozen 100-foot gillnetters serving it. It's a floating factory. It can fish, freezes fish, smokes fish, salts fish. It does everything. It can stay out for years without returning to Japan." (Smaller cargo ships would carry the goods to market.) The king salmon of the Yukon were particularly prized in Tokyo. "They'd catch half a million kings in the Bering Sea every year," Schulteis recalled. "It was no big deal." That style of high-seas salmon fishing was banned by the United States in 1974, when it asserted sovereignty over waters within 200 miles of its coasts. The salmon fishing moved upriver, where the Yupik, who had been issued the only commercial fishing permits for the lower Yukon, suddenly found themselves sitting on a gold mine. The 700 permits can be sold but are generally kept within a family. By the early 1990s, Emmonak, situated in the direct path of the biggest runs of the very best salmon, was the center of a thriving fishery. The going rate for a fishing permit soared to \$45,000. (Today it is worth \$10,000 at most.) As many as eight companies moved their processor barges into the area for the season. Big boats can't negotiate the wide, shallow Yukon River and its shifting sandbars, so all the fishing was done by individuals or two-person teams drift-netting in flat, twenty-foot open skiffs.

"It was a circus," Schulteis said. "The competition was unbelievable. They had everything from fish-ticket bingo to trucks being given as prizes to the fisherman who delivers the most fish in a season." Japanese demand drove the price for Yukon kings extraordinarily high. Fishermen could get \$5 a pound, meaning \$200 for a single big Yukon king. And they could catch a hundred

fish in one hour of drift-netting. "You could walk across the river, there were so many fish," said Schulteis. "Right out here on this little channel, you couldn't even make a whole drift; you'd have to pull your net up because it was full. It was that good. Such a huge river, such a big watershed, such good spawning streams, wilderness, all the natural things that salmon need. This was a huge, huge run. We'd take 120,000 fish, and they'd still get 300,000 fish on the spawning grounds."

In the best years, some Yupik fishermen made \$40,000. And they invested in shiny new \$12,000 aluminum skiffs that could hold more fish, powerful \$15,000 115-horsepower outboards that could get them to more fishing grounds in less time, and new nets that cost \$1,500. Emmonak sprouted satellite dishes and fleets of red Honda ATVs and snowmobiles. "When I was a boy we had kayaks," Martin Moore recalled. "Dog team was the only transportation besides the kayak. Each family had ten to fifteen dogs they had to feed. That many dogs eat a lot of salmon. You can't support fifteen dogs today. You'd have to be rich." Snowmobiles and outboards cost less to "feed" than dogs and kayak paddlers did.

A lot of small changes occurred in those good years, but the influx of cash also helped the Yupik keep their community intact. Young men had no interest in moving to Anchorage or the Prudhoe Bay oil fields when they could live well hunting and fishing in Emmonak. Assisted in part by their extreme isolation, the Yupik have done a better job than most North American indigenous groups of holding on to their traditional lifestyle, depending on how you define it. Modern vehicles have made them more efficient, but they still follow the seasonal rhythms of nomadic hunter-gatherers: fish camp in late spring, berry picking in the summer, moose hunting in the fall, impromptu seal and beluga hunts anytime the call goes out over the radio. Their lives are still salmon-powered, though instead of fueling the people and dogs directly, the salmon now gets converted to cash and oil first.

In 1998, the king season opened on schedule. Because most spawning kings are five or six years old, the size of a spawning run can be predicted based

on the juvenile escapement numbers of five and six years prior, and 1998 was supposed to be a good year. But the fish didn't show. "That was a spooky time here," said Schulteis. "I remember the opening of the season. A lady pulled up with eight fish, and they looked like they'd grown up in Auschwitz." The few fish that made it back to the river were emaciated. For some reason, they'd been starving in the Bering Sea.

Whatever the cause, the results were unequivocal: disappearing salmon, followed by disappearing fish buyers. The Disaster Years continued: 1999 was poor, 2000 was horrible, and 2001 was so bad that the commercial season was canceled. At the same time, pressure from hatcheries drove down the price of still abundant chum salmon from 40 cents a pound to 5 cents. A town that had briefly raised its head out of poverty fell back into it. Then, in 2002, the fish came back—not at pre-1998 levels, but enough that 30,000 or 40,000 kings could be taken for the commercial catch.

By then, only one fish buyer, Bering Sea Fisheries, remained near Emmonak, and it looked less than stable. Besides, with a monopoly, Bering Sea Fisheries offered just 50 cents per pound for kings. So, days before the season was set to open, the native-owned Yukon Delta Fisheries Development Association—charged with economic development in the region—took a radical step. It formed Kwikpak Fisheries, cobbled together from processing equipment left in the exodus of the Disaster Years. Kwikpak guaranteed its fishermen a living wage for their fish (\$4.45 per pound in 2007), becoming the first Fair Trade fishery in the world. Not many locals took their salmon to Bering Sea Fisheries, which closed its doors in 2007.

"Kwikpak" sounds like a cheesy name for a company that guarantees its fish in Anchorage the day it's caught, but the village elders who chose the name were unaware of the English echo. Some of them didn't even speak English. To them, Kwikpak means something like "great river" or "river of life." It is the Yukon, their universe.

On June 18 rumors flew around town that the 2008 commercial sea-

son would start that day. Men tromped back into Schulteis's office. "Not today," he told them. "Maybe tomorrow." But the latest announcement from Fish and Game made that sound unlikely:

Because of the unexpected weak Chinook run in 2007, the department will be delaying Chinook directed commercial fishing in 2008 until near midpoint of the run to provide for escapement and subsistence needs and Canadian border passage obligations. At that time, Chinook directed openings may occur if a surplus is identified beyond escapement and subsistence needs.

One longtime observer of the scene confided in me that he believed Fish and Game was feeling pressure from Canada for opening the season too early in 2007. "Somebody fucked up last year, and now they're punishing these people for it."

That night I went subsistence fishing with Billy Charles, a founding member of the Yukon Delta Fisheries Development Association, and his wife, Grace. We motored to Big Eddy, a bend in the river famous for its swirling currents, which round up the salmon. "You see that riffle of dark water?" Billy said, pointing. "That's where they'll be." He threw the hundred-foot net over the side in bunches while Grace inched the boat backward to keep the net taut. Rain lashed our faces, and we could see storms pounding the flat distance.

The top edge of the gill net floated on white bobs while the rest hung into the water like a curtain. Whenever a bob began to bounce and disappear under the surface, Grace made a trill of deep contentment and said, to no one in particular, "Mmm, caught a king."

Rather than migrating steadily, kings move upriver in "pulses." The arrival of flocks of blue swallows in the delta signals the first pulse of salmon, known as the black-head kings. After a few days, the second pulse, the white-nose kings, moves through. Later pulses of kings are hoped for but not guaranteed.

After a half-hour of drifting, Billy hauled in the net, calling for Grace's assistance. "Used to be able to do this alone," he said sheepishly. They pulled hand over hand, and a dozen shining, silvery black-head kings flopped into

the bottom of the boat. "Mmm," said Grace, "caught a king."

When we got back to Emmonak, people were smoking their subsistence catch. The entire town smelled like smoked salmon. The pink, fleshy spines of king carcasses hung in the open air, drying for winter dog food. Later that night, someone spotted a grizzly at the edge of town, and within minutes a dozen men with rifles went buzzing forth on ATVs like angry bees, but the bear slipped away into the alder swamp.

On June 20, I was told that "a very reliable source" had said that the commercial season would finally open the next day. But when I checked the Fish and Game announcement in the Kwikpak office, the tone had turned ominous:

The Pilot Station sonar passage estimate through June 19 is approximately 20,900 Chinook which is below the average of 47,100 for this date. . . . Because the Chinook salmon run is below average at this time, the department is allowing fish to pass through the lower river districts in order to meet escapement, subsistence uses and Canadian border obligations. The department will continue to assess the Chinook salmon run daily to determine if any directed Chinook commercial fishing periods are warranted.

Schulteis was back on his stoop, smoking in the gray drizzle. "The Yukon is rated the best-managed fishery in Alaska because of all the management tools and techniques we're using to restore this fishery and make it sustainable," he growled. "We're certified by the Marine Stewardship Council. It's frustrating, because you've got all these people working so hard to keep this thing stable and nourish it, and people have made tremendous sacrifices. We're supposed to put 40,000 fish into Canada. We put 80,000 into Canada. Everyone's doing what we're supposed to do, okay, and we're not getting our fish back."

The fishery was confronting the limitations of working with a creature that moves between two worlds. Along the river, it could at least attempt to manage the conditions surrounding the salmon's birth and death, but it had little control over

the rest of the fish's life out at sea. Five and six years ago, lots of little kings had swum out into the Bering Sea. But so far they hadn't returned.

Many believe the problem is bycatch on the Bering Sea, which is home to the pollock fleet, the largest fishery in the world. Each year 100 million tons of pollock are raked from the Bering Sea, and along with the pollock come nearly 130,000 king salmon—more than three times the lower Yukon's entire commercial harvest. The fish are dead by the time the nets are pulled. Pollock fishermen are required to throw the dead salmon overboard.

Schulteis believes bycatch is a big part of the problem, but he has another suspect as well—hatcheries producing chum salmon. He thinks this is why kings are getting not only less numerous but also smaller. "There are five billion hatchery smolt released every year in the Bering Sea. Five billion. You've got Japan releasing fish, Russia, Korea. But Alaska's the worst. What's the carrying capacity of the Bering Sea? Some scientists think it has been maxed out. There's a noticeable difference now. When you release five billion fish, year in and year out, that's a lot of extra mouths to feed. Something's gotta give."

Yet there are troubling signs that the Bering Sea's problems are more fundamental than either bycatch or hatcheries. In fact, after decades as a seemingly inexhaustible resource, even the pollock have begun to dwindle.

Most people are surprised to learn that pollock is the most widely consumed fish in the world. Its name rarely graces restaurant menus, but pollock is as white, mild, and cheap as fish can be. It supplies the non-flavor of everything from fake crab to McDonald's Filet-O-Fish sandwiches. And it all comes from the Bering Sea. The pollock fishery supplies about 40 percent of the seafood harvest for the entire United States.

But the pollock harvests are at a twenty-year low as well. In 2007, in a development reminiscent of the beginning of the collapse of the Atlantic cod fishery, pollock fishermen caught 60 million pounds less than their quota, and not for lack of trying. Indeed, the fishermen were beginning to roam.

Whereas a decade ago the waters around Dutch Harbor yielded all the pollock, today they are barren, and boats are forced to creep farther and farther across the Bering Sea, closing in on Siberia and burning up their profits in fuel. In 2008, in an attempt to avoid a cod-style collapse, fishery managers slashed the pollock quota by 28 percent.

The Bering Sea is not making fish like it used to, and the prime suspect is a decades-long temperature rise. Whether this is due to fossil fuel-driven global warming or to a natural oscillation, the upwelling effect is lessening and the ecosystem is changing. In 1997, for the first time in recorded history, boats in the Bering Sea encountered vast stretches that had turned an eerie, brilliant turquoise. The sea was experiencing a massive bloom of coccolithophores, a type of plankton that thrives in the nutrient-poor surface waters of the tropics. Coccolithophores make microscopic chalky shells that scatter light and create that Caribbean blue—beautiful, but indicative of a system that has little food.

The coccolithophores replaced the plankton that normally feed the Bering Sea food chain. And by changing the color and refractive intensity of the sea, they may even have made it difficult for some species to find their prey. Tens of thousands of shearwaters and other birds died. Gray whales, undernourished, washed up dead along their migratory routes. When salmon die at sea nobody notices, but everyone noticed when the salmon didn't return the following summer.

The coccolithophore blooms continued until 2001, then petered out. The salmon populations came out of their decline the following year, but they never returned to their pre-1998 numbers. Even at current quotas, the salmon provide the average Yupik household with just \$5,000 a year. Already families are starting to skip weddings and funerals in other villages. Also threatened is the trip from Emmonak to the coast to pick salmonberries, a traditional August treat, which that summer required about \$330 of fuel. "Salmonberries are a special food given as gifts at our

potlatch ceremonies," Martin Moore told me. "If you said, 'We're not gonna have a potlatch this year,' the people would think you were crazy. There's always a Christmas, right?"

So let them go back to their kayaks and dogsleds, some might say. Their culture will be strengthened for it. But they are no more ready to do that than other Americans are to plow their own fields with horses. It takes only one generation to lose the old skills.

The night of the funeral dance, Kwikpak invited the Fish and Game staff to dinner at the bunkhouse in a sort of goodwill gesture. When I excused myself to attend the dance, Steve Hayes—Fish and Game's area manager for the Yukon and the man who opens and closes the fishing seasons—offered me a ride in his truck. On the way, I pressed him about when the commercial season might open. "The numbers are just terrible," he said. He hesitated for a moment, as if debating something, then continued. "There won't be any directed fishing on the river this year. I'm even going to have to reduce subsistence fishing."

The Disaster Years had returned. Hayes explained that it wasn't just the sonar. The test nets, the samples from locals' subsistence catches—they all told the same story. "I have to go by the numbers," he said. He was waiting until the day after the funeral to make the announcement.

I tried to picture Ray Waska and Martin Moore and Simon Harpak and Billy Charles receiving this news, counting their remaining cash and checking their fuel supplies.*

Hayes pulled up in front of a

** In fact, a few months later the Yukon would freeze before the town was able to receive a new supply of fuel. The temperature settled at around thirty below and didn't rise for months. By January 2009, the only heating fuel reaching the delta was being flown in and cost \$11 per gallon. Venezuela had announced the end of its fuel-assistance program, and many families in the delta were surviving on one meal a day and scrounging for firewood in the snow. In response to a call for emergency aid, Governor Sarah Palin extended the moose-hunting season in the area. "People can have more of that healthy abundant protein that is already out there," she said. "They can hunt, and that's a big darn deal."*

boardwalk and gave me directions to the dance. He wasn't going, for obvious reasons. "Follow the boardwalk around the school, then keep on going straight all the way until it ends." The boardwalk, three feet wide and two feet off the ground, cut through the alder swamp. At first houses backed up to it on both sides, but then the houses ended and the swamp closed in. Huge mosquitoes waited like buzzards on the alder branches, flapping into action as I passed. The boardwalk, funded by the ministrations of former Alaska senator Ted Stevens, kept going, straight as an arrow, for half a mile. It was the longest boardwalk I'd ever been on, the most impressive structure in Emmonak. But I heard nothing ahead. I kept walking, farther and farther from town.

And then the swamp ended and the boardwalk deposited me in front of a forest of crosses listing in the thawing tundra. Hayes, perhaps preoccupied, had confused the dance with the funeral. I was all alone with the bodies of everyone who had ever died in Emmonak. Bodies can't be buried in the ground here; there is no ground. Dig a hole and you find water. Instead, the Yupik place the coffins on the tundra, cut chunks of turf and pile them loosely on the coffins, wrap chicken wire over the top in a futile effort to keep bears out, and decorate the mounds with plastic flowers. Each grave had a cross with the name and birth and death dates.

At the far end of the graveyard, I came upon a freshly painted cross. ELIZABETH MARY REDFOX, NOVEMBER 8, 1965—JUNE 18, 2008. A few shovelfuls of turf and some pink plastic roses adorned the white coffin. Three shovels lay to the side. Perhaps someone would come back later to finish the job after the dancing in honor of Elizabeth Redfox was complete. It was past ten at night. The sun was low on the horizon, panning sideways. Snipe cut through the air, piping. My neck prickled unaccountably, and I remembered the bear. I was assuredly the only person, white or Yupik, foolish enough to be out there alone

and unarmed. Earlier I'd badly wanted to see a grizzly; now I was eager not to. I retreated and found my way to the community center, a nice wood building that could have been a community center in any American town. Inside, a kayak, carved a century ago, hung from one wall over a stage. An electronic bingo prompter hung on the opposite wall. The benches around the perimeter were packed with people.

I squeezed onto a bench next to a friendly-looking man named Paul Andrews. He told me he'd made \$7,000 fishing last year. He'd hoped to do better this year, but now he was scared. He mentioned that his wife made barrettes out of beads and fur and wondered if I might be interested in buying any.

Onstage, ten elders beat drums made of wood and red plastic. A dozen female dancers wearing hand-made dresses of lavender, green, and periwinkle swayed in place, bouncing at the knees and making looping hand motions. Paul pointed out his favorite dancers. He liked the way certain ones could make expressive gestures and still keep perfect time. All the dances told stories, he explained. Many were old ones about fishing and hunting, but they could be about anything. Now there was one about snowmobiling.

Ten mostly young men joined the next dance, kneeling in front of the women. They held dance fans, made of five snowy owl feathers that resembled white talons. The tempo increased and the drummers began chanting. The men raked the air with violent swipes to the sharp reports of the drums. The women moved more softly, waving long, white grasses and bending like sea fans in the current.

The dancing went on well past midnight, and the dance floor grew more crowded. When the dancers rested, children moved through the crowd, handing out Fruit Roll-Ups, Tootsie Pops, Ricola cough drops, and other candy. No salmon or salmonberries tonight. I sipped a can of grape soda. I watched the children, wondering who among them was a relative of the deceased, until I realized that they all were. ■

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SOLUTION TO THE APRIL PUZZLE

NOTES FOR "SIXES AND SEVENS":

Puzzle editing by Dan Asimov.
Note: * indicates an anagram.

ACROSS: 11. ba(i)t; 12. *. 16. *. 23. Dec.-on-gest*-ant; 28. I-cons, pun; 29. *

DOWN: 2. D-one; 4. *. 6. w(hit-ewash*)ing; 7. rabbi(t); 9. ste(p)-in; 23. dog-MA; 24. crass, hidden in reverse; 26. (g)oner

SIX-LETTER WORDS: a. tr(U.S.-t[ennis])y; b. instar*; c. zanier, hidden; d. Astros*; e. a-n-G-sts; f. (go)oglers; g. s(l)a[i]nts; h. tw(0)-E[r]P's; i. asses-S; j. selahs*; k. Add(AM)s; l. ignore*

SEVEN-LETTER WORDS: i. diabol*-O; ii. abs-tain*; iii. qui-B(i)ble; iv. p(ill)age; v. artiste*, double anagram; vi. r(ingle)t; vii. boudoir, hidden; viii. gla(C-E-E)d; ix. needles(s); x. dualism, ms-I-laud, (rev.)

A	D	D	A	M	S	T	W	E	R	P	S
B	O	U	D	O	I	R	H	B	A	I	T
S	N	A	F	U	Q	U	I	B	B	L	E
T	E	L	A	N	G	S	T	S	B	L	I
A	R	I	S	T	O	T	E	L	I	A	N
I	N	S	T	A	R	Y	W	A	D	G	A
N	E	M	R	I	O	Z	A	N	I	E	R
D	E	C	O	N	G	E	S	T	A	N	T
O	D	R	S	E	L	A	H	S	B	O	I
G	L	A	C	E	E	D	I	C	O	N	S
M	E	S	A	R	R	I	N	G	L	E	T
A	S	S	E	S	S	I	G	N	O	R	E