MARINE BIOLOGY

Scientific Dispute at Center of Legal Battle Over Salmon Catch

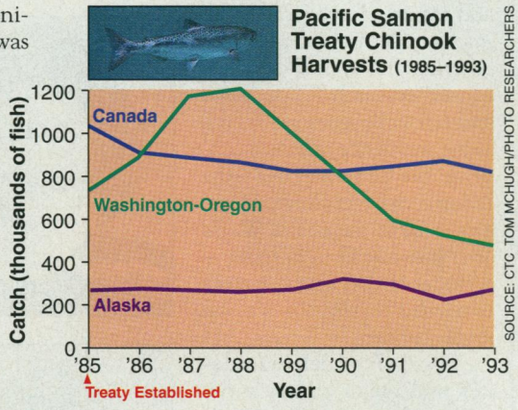
SEATTLE—When the governments of Canada and the United States signed the Pacific Salmon Treaty 10 years ago, they hoped that, after years of political and legal battles, the regulation of salmon fishing in the northeast Pacific would finally be in the hands of scientists rather than lawyers. But the bitterly contested issue of how many salmon can be caught in which region was back in the courts in August, when a federal judge in Seattle temporarily shut down Alaska's chinook salmon fishery. Last week, U.S. District Judge Barbara Rothstein ruled that it should remain closed for the rest of the season, due to end on 20 September. Ironically, the return to the courtroom was prompted in part by disagreement among scientists over the way Alaska set its 1995 salmon catch.

Nobody is surprised that lawyers are back in control. The treaty was already on the verge of collapse, after Canada walked out of the negotiations 2 years ago, and there was plenty of room for further acrimony. After all, the regulation of salmon fishing in the Pacific involves the livelihood of three different commercial fisheries—those in Alaska, British Columbia, and Washington and Oregon—as well as the rights of northwest Indian tribes. All are competing for a resource that has been considered in danger for decades, partly from overfishing and partly from the damming of some of the salmon's major spawning rivers. And the science of fisheries management is still uncertain.

Complicating both the science and the politics of the fishery is the remarkable life cycle of the chinook, or king salmon. Salmon migrate thousands of miles over the course of their 6 or 7 year life cycle, beyond the jurisdiction of the government in whose waters they spawn. Over 80% of Alaska's commercial chinook catch, for example, comes from streams in Washington, Oregon, or British Columbia. As a result, the size of the catch in one region affects stocks in all the others.

In 1985, after intense negotiations, the United States and Canada signed the Pacific Salmon Treaty in an attempt to establish a cooperative framework for managing and rebuilding Pacific salmon stocks. The United States and Canada agreed to set ceilings on the number of fish to be caught in each region in order to rebuild the chinook stock. To recommend and evaluate these management plans, the treaty set up a bilateral scientific group called the Chinook Technical Committee (CTC).

The CTC used a computer model, which has been refined over the years, to evaluate the ceilings. It is based on previous catch levels along the coast, population projections from the size of the spring salmon runs, and the expected effects on future runs of limits on the size of fish that can be caught. The CTC's recommendations on how to rebuild the stocks have mostly been adopted. The total chinook catch has declined from about 2.3 million in 1985 to 1.56 million in 1993.



Declining harvests. The total Pacific salmon catch has declined, especially in Washington and Oregon.

But antagonisms over the distribution of the salmon catch haven't disappeared. Indeed, relations between Canada and Alaska have gone from chilly to freezing, with Canada charging that it has not been getting its fair share of the salmon that originate in Canadian waters. (In addition to chinook, which is the most valuable commercial species, the treaty covers pink, chum, sockeye, and coho in certain areas.) The dispute came to a head when Canada left the negotiating table 2 years ago. Until the talks resume, each region will set its own limit.

Last year, the three regions did so, using the CTC's model to make preseason estimates of abundance, and no serious political crisis ensued. This year, however, hostilities broke out with a vengeance when Alaska adopted a new method and set a limit for its chinook fishery of 230,000 fish, roughly the same number it caught last year. Canada, in contrast, cut its limit by 50% from recent catch years, and Washington-Oregon eliminated the majority of its ocean chinook fisheries because of low preseason projections. Canadian scientists say the Alaska limit should have been 140,000 to assure the rebuilding of depleted stocks. In July, Canada's Minister of Fisheries Brian Tobin stepped up the rhetoric, calling Alaska's chinook fishery a "frenzy of greed" designed by "shortsighted and self-interested fishery managers."

Twenty-four Indian tribes from Washington and Oregon promptly filed suit, arguing that Alaska's catch would seriously deplete the number of salmon that would return to spawn in Oregon and Washington rivers. Canada and the governments of Washington and Oregon weighed in, filing briefs in the case.

The tribes won their first victory on 11 August, when Judge Rothstein issued a temporary restraining order, halting chinook fishing in Alaskan waters while the court examined the issues further. (By that time, Alaska had caught 175,000 fish.) In hearings during the first week of September, Rothstein got a quick course in the science of fisheries management, when scientific experts from all three regions testified.

The scientific arguments centered on a new method of setting catch limits that Alaska used for the first time this spring. Instead of establishing ceilings based on computer projections of population, Alaska's method aims at estimating the population directly—an approach known as abundance-based management. Fishery managers monitor the catches of 400 fishing boats in the first 5 days of the fishery, calculate the catch per unit of time spent fishing, compare the result with the average harvest rate from recent years (1991 to 1993), and calculate the southeast Alaska chinook quota. "It is based on the simple concept that as abundance goes up, catches go up, and as abundance goes down, the catch goes down," says John E. Clark, a biometrician with the Alaska Department of Fish and Game, who developed the new plan. Alaska managers say they adopted the system because they had long suspected that the abundance of chinook in southeast Alaska was higher than the CTC's computer projections indicated.

Canadian and tribal scientists sharply criticized the new method. Research scientist Brian Riddell, who represents Canada's Department of Fisheries and Oceans, told the court that Alaska's calculations might reflect only the abundance of chinook in southeast Alaska; they provide no indication of what is happening to stocks all over the coast. Moreover, he argued that Alaska's method doesn't account for increases in fishing efficiency. He worries that under Alaska's plan, king salmon could have the same fate as Canada's Atlantic cod fishery, in which managers overestimated abundance because they didn't account for the efficiency of new trawlers. "The ceiling may not be the best way to manage, but it's safer than implementing systems that don't function," says Riddell.

Biometrician Jim Scott, who works for

the Northwest Indian Fisheries Commission and co-chairs the CTC, was especially upset that Alaska unveiled its new system in March and implemented it in July. "Alaska more or less dropped this on everyone," leaving no time to evaluate it, he says.

While Canadian and tribal scientists argue that science is at the heart of the salmon controversy, Alaska says politics is really driving the court case. "There is a thin line between science and politics," says Scott Marshall, southeast regional supervisor for commercial fisheries management in the Alaska Department of Fish and Game, and "a few of the Canadian and Washington scientists just stepped over that line." In his closing remarks, Alaska attorney Michael Stanley told the judge that "shutting down Alaska fisheries will do nothing to rebuild stocks down south." He used charts and graphs to show that even if Alaska cut its quota by 50%, the depleted Washington and Oregon runs would increase by only a few hundred fish. The real cause of those dep t ted runs, Stanley argued, is the damming of major salmon rivers in the Pacific Northwest for hydroelectric power.

While recognizing that the dams have contributed to the decline, the tribes say the entire region—including Alaska—needs to make an effort toward conservation. "Alaska is fishing above the model, and it has an accumulative effect. We all have to work together toward rebuilding," says Katherine Brigham, the tribal alternate for the Pacific Salmon Commission.

Apparently, Judge Rothstein agrees. In a 36-page decision issued on 7 September, Rothstein ruled that Alaska's fishery should remain closed for the rest of the season. Alaska, Rothstein wrote, failed to make "a good-faith effort" to help rebuild the salmon stocks in the entire region. "The court finds it reasonable that Alaska wanted to explore alternative models or refinement of the CTC model. However ... Alaska acted unreasonably in the manner in which it attempted to implement its 1995 plan," Rothstein wrote. She said the dispute should be resolved through the Pacific Salmon Treaty process.

Alaska attorneys say they plan to appeal the decision. But whatever the outcome of the battle over the 1995 Alaska catch, the underlying dispute could threaten the future of salmon fishing in the entire region. The United States and Canada have agreed to appoint a mediator to help settle their dispute. But on the U.S. side, a precursor to the treaty requires Washington, Oregon, and Alaska to shut down their salmon fisheries if they can't agree on the allocation of catches by 1998. In that case, the issue is sure to remain firmly in the hands of the lawyers.

–Lisa Busch

Lisa Busch is a science writer based in Alaska.

BIOMEDICAL RESEARCH

Breast Cancer Activists Seek Voice in Research Decisions

MINNEAPOLIS—The president of the National Breast Cancer Coalition addressed her audience as a field commander might welcome new troops. "I think about you as sort of the Delta Strike Force, the Green Berets, the elites," Fran Visco told a group of women gathered in a hotel meeting room here in mid-July. But the battle plan Visco presented is not so much an all-out attack on an enemy camp as a campaign to infiltrate the ranks of an ally: the cancer-research establishment.

"What we're trying to form," Visco told the women, "is a group of breast cancer advocates across the country who are educated and informed, who can work side by side with scientists in charting the course of breast cancer research." As Visco and her colleagues see it, the rising incidence of breast cancer in the United States—the lifetime risk has climbed from one in 20 at the end of World War II to one in eight today—is evidence that a new strategy is needed to win the war on breast cancer.

LEADers. Fran Visco (*top*) and Kay Dickersin developed program to train advocates.

Visco, a Philadelphia attorney and breast cancer survivor, and the coalition she heads have already had a major impact through an effective lobbying campaign that has increased federal funds for breast cancer programs. Now their goal is to play a role in deciding how those funds are spent. And that's where Visco's "Delta Strike Force" comes in. The 38 women in her audience were among the first to take part in Project LEAD (Leadership Education and Advocacy Development), which begins with a 3 1/2-day workshop designed to give breast cancer advocates enough knowledge of science and the research process to enable them to participate at every level. Visco expects Project LEAD trainees to join local boards that review research on human subjects, planning committees, and peer-review study sections of the National Institutes of Health (NIH). But some scientists do not consider it wise to invite such novices into the inner sanctum.

Even researchers who welcome advocates on advisory committees are wary of having them involved directly in scientific decision-making. They argue that the gold standard by which any scientific effort is judged is peer review, not peer-and-other-interested-parties review. But the coalition's leaders dismiss such concerns. "Yes, it is" a radical approach, "but it shouldn't be," says Kay Dickersin, a University of Maryland epidemiologist who designed Project LEAD. Dickersin is a breast cancer survivor and founding member of the coalition, which has 270 member organizations representing thousands of women around the country. Scientists think "we can help set programmatic goals but [that] we don't know enough about science to judge it ... and we're here because we disagree with that," Dickersin told the women attending the workshop.

Deeper involvement. Project LEAD is a new twist on an established trend of public involvement in biomedical research. Activists have long shaped the landscape by raising funds to combat specific diseases, lobbying Congress to earmark funds, even creating new NIH institutes focused on "their" disease. But, with AIDS groups leading the way, activists in the late 1980s began to get more deeply involved in the planning of research, gaining representation on scientific advisory committees.

The Breast Cancer Coalition has been one of the more successful and aggressive of this new breed. Federal spending on breast cancer research was about $90 million a year when the coalition formed in 1991. Now it's about $475 million, largely due to the lobbying efforts of Visco and her colleagues. The coalition's most spectacular success was to persuade Congress in 1992 to add $200 million to the Department of Defense's (DOD's) budget to fund a new breast cancer research program (*Science*, 29 January 1993, p. 616).

Reaching for the reins in 1993, the coalition lobbied for the creation of a multiagency National Action Plan on Breast Cancer. They gained support from the White House and the Capitol, where 52 senators and more than 200 members of Congress signed letters of support. Health and Human Services (HHS) Secretary Donna Shalala