



Sustainable and Wild

As Alaska entered the new millennium, most of its major fisheries were at peak levels of production, managed by scientific principles, and the state's management of its wild fish stocks was recognized as sustainable both at home and abroad.

In Alaska, the many steps that had led to the dramatic resurgence of Alaska salmon since statehood were enshrined as a matter of policy by the Fish Board in 2000. Adoption of the Sustainable Salmon Fisheries Policy was followed later that year by a stamp of approval from the London-based Marine Stewardship Council. In the years to come, other Alaska fisheries met the same standard: pollock, halibut, sablefish, and freezer-longline cod were certified as sustainable by the Marine Stewardship Council.

The designations recognized the effectiveness of management by the Alaska Department of Fish and Game, the North Pacific Fishery Management Council and International Pacific Halibut Commission and was intended to appeal to consumers who want to make responsible choices when buying seafood.

The same care was not being taken elsewhere. Around the world, 30 percent of fish stocks are considered overfished and the trend is rising, what some have called a pending global fish crisis. Major fisheries like New England cod and Mediterranean bluefin tuna continue to be harvested despite their depleted condition. In an article about threatened fisheries, *National Geographic* magazine listed Alaska as one of only three well-managed fisheries in the world, the others being Iceland and New Zealand. When the Magnuson-Stevens Act was renegotiated in 2006, Alaska's fishery management practices were held as a model for other regional councils around the country to follow.

Another word was increasingly used to define Alaska seafood in the 21st century. Seeking to differentiate its catch from the growing volume of pen-reared fish, Alaska salmon and other seafood branded itself as "wild." Free of chemical additives or artificial coloring, wild fish appealed to a growing number of health and quality-conscious consumers. Some wild salmon even became celebrities. Every spring,

seafood paparazzi descended on Cordova as the first Copper River king salmon of the season was caught, cleaned and chilled, flown by helicopter to the Merle "Mudhole" Smith airport, jetted to Seattle aboard a "Salmon-Thirty-Salmon," and within hours of its capture in the wild was served at the finest restaurants and for a premium price.

Wild salmon runs remained generally strong throughout the state, and combined with continued strong hatchery production set yet another record in 2005 with a harvest of 222 million salmon, just under one billion pounds, a record that was nearly repeated in 2007. Halibut hit a record 60 million pounds in 2002 and continued at that level for the next two years before tapering back. Likewise, pollock peaked with catches over 3 billion pounds annually mid-decade before also turning downward. In both cases, biologists considered the drop a cyclical downturn. Even with harvests totaling in the billions of pounds, none of Alaska's groundfish stocks are considered overfished or approaching that condition.

One fishery was far off its peak production but after four decades of booms and busts for Alaska crab, the 21st century brought something unprecedented in the crab fishery's roller coaster history: stability. Fishermen landed an average of about 20 million pounds of king crab and 30 million pounds of snow crab annually, and rarely varied from that by more than 5 million pounds. As harvests stabilized, so did the fleet. Despite its reputation as a cowboy fishery, access was limited and catch shares were later handed out among the vessel owners and skippers much as they were awarded for halibut and pollock. Crab rationalization, as it was known then, went a controversial step further, assigning most catch shares to specific processors, sparking a debate that continues to this day. But even as television heralded it as the "deadliest catch," the Alaska crab fishery was being tamed.

As Alaska neared 50 years of fishery management, its commercial fisheries were stronger than ever, yet serious concerns and future challenges still remained.

Left: Five species of salmon.
Photo courtesy of ASMI.

Shaping Alaska's History

Genetics

With hundreds of millions of salmon returning to Alaska every year, fishery managers need to understand where they came from and where they are going. In the past, scientists conducted tagging studies to get an idea of their migration patterns. Biologists even studied the growth rings on the salmon's scales to better understand their origin.

Genetics provided a better way to answer the question—and on a real time basis. “The scale pattern analyses had to be done post-season but genetics could provide this information in-season and, in many cases, in a much more cost effective manner,” said geneticist Lisa Seeb.

Lisa and her husband Jim, both geneticists, joined the Department in the early 1990s. He worked with the FRED Division and she with commercial fisheries. The hatchery work stemmed from a state policy to protect the genetic integrity of

regional fish populations and prevented brood stocks from coming from out of state and even from different regions within the state. The FRED Division also needed to monitor returns to ensure there were no adverse effects of hatchery fish on wild stocks.

Studies of commercial fisheries tried to sort out the origin of salmon in mixed stock fishing zones, such as for Cook Inlet sockeye, Southeast Chinook salmon and chums landed on the South Peninsula Area M fishery. Scientists examined genetic markers that were first derived from proteins and now rely on DNA sequences known as SNPs that have a much higher degree of resolution.

Recognizing its importance, the Department led the effort to standardize genetic markers and databases among different agencies and nations. Genetic stock identification is now in high demand.

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“If anything, the science has become more and more incorporated into fishery management and the information is desired by more and more fishery managers as part of their tool kit,” said Lisa Seeb. “Port Moller is the best example of what genetics can provide for the fishery.”

The Port Moller test fishery, operated by the Bristol Bay Salmon Research Institute with help from Fish and Game geneticists, samples the large Bristol Bay salmon run a week before the fish arrive. That “heads up” about the actual run size and composition allows fishery managers to be more confident in making decisions about openings and closings.

“In 2006 there was a large return to the Wood River that wasn't forecast but was picked up very clearly at Port Moller and resulted in more openings in that area,” Lisa Seeb said. “Managers were more confident of what is coming and where they're

Biologists are placing genetic samples from sockeye salmon samples into liquid nitrogen at the Orzinski weir.
Photo ADF&G.



Shaping Alaska's History

headed. It has been a substantial benefit to the fishermen in terms of being able to catch additional fish; a substantial monetary advantage.”

In fact, the sockeye return that year was more than twice what was forecast but thanks to the genetic data from Port Moller, biologists were able to allow a harvest of over 11 million sockeye, an all-time record for the Nushagak, and still made escapement goals.

Now similar studies are being planned for other fisheries around Alaska and other genetic work is continuing. The Western Alaska Salmon Stock Identification Project

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is seeking to monitor chum and sockeye salmon throughout their migratory range. With some 75,000 samples to be collected over three years this program is among the biggest genetic stock identification projects in the world.

Insert: A tissue sample is taken. Using genetic baseline data gathered from Alaska river systems, ADF&G geneticists can process tissue samples taken from commercially harvested salmon to determine the spawning destination of each fish.

Photo ADF&G.



Above: Bristol Bay fishery.
Photo courtesy of ASMI.

Shaping Alaska's History

A Policy for Sustainability

As Alaska salmon production hit new heights in the 1990s, some looked to identify the reasons for that success and put them in writing. "People felt pretty confident that we had a good salmon management system and were responsible for healthy fisheries so why not capitalize on that by enshrining in policy something that we were already doing and doing well," said former Deputy Commissioner Rob Bosworth.

Elsewhere there was similar movement in that direction. Consumers had taken note about fishery depletions in other corners of the globe. Several groups started publishing lists of well managed, sustainable fisheries. Sustainability was more than a buzzword, it was becoming a marketing tool designed to appeal to consumers who were increasingly concerned with conservation.

The policy took three years and more than 30 public meetings to craft. The process involved commercial, sport and subsistence fishermen; scientists, researchers and fishery managers; seafood processors, hatchery managers and conservation groups. Some were skeptical of the idea at first. Others worried that a broad policy might only hamstring the Fish Board and open their decisions to litigation. But supporters said the sustainable salmon policy advanced the discussion of protecting a resource that was critical to the state.

"Salmon embody the connections between the oceans and the upland watersheds which sustain us all," said John White of Bethel, then chairman of the Alaska Board of Fisheries. "The time is right for us to clearly articulate the ways that fisheries science, management, and public process must work together

to protect Alaska's precious salmon resource."

It became known as the Policy for the Management of Sustainable Salmon Fisheries. "First and foremost it offers two things up front," said White, "A template in which to make decisions about how to regulate salmon stocks in the state of Alaska, and a common language that was carefully vetted so that no matter where you were in the state, the different terms in the discussion of salmon stocks were defined and understood before the regulatory body and the users themselves. It was basically a list of tools and definitions; how to play off the same sheet of music."

The policy was based on basic principles including protection of wild salmon populations and their habitats; spawning escapements that conserve and sustain potential salmon production and maintain normal ecosystem functioning; public support for sustained use and protection of salmon; and, in the face of uncertainty, salmon stocks, fisheries, artificial propagation and essential habitats must be managed conservatively.

Many of these concepts such as the concluding precautionary principle were not new, but putting them in writing was. "It was a new structure for doing what many already exercised—to err on the side of caution in the face of uncertainty—something that's particularly relevant for board members looking at new proposals," said Bosworth. The same was true for the system for identifying stocks of concern, which Bosworth said has proved to be one of the policy's most important parts. "It forces the Department to acknowledge problems before they become severe. It really made a difference structurally in the interface

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of the Department, the public and scientists. I think that was a major step for transparency and conservation."

The nine-page document was adopted by the board in 2000 and to its designers, it remains a living document. "The Policy for the Management of Sustainable Salmon Fisheries" is a good template, if not the best, it's certainly one of the better in the nation," said John White. "It helped assure our salmon fisheries received the Marine Stewardship Council label but everything can be improved, and more work and amendments to that policy will make it even better. I think the future is more and better research and the involvement of stakeholders in that research; identifying problems and systematically apply research to those problems that are going to occur in the future."



Spawning salmon.
Photo ADF&G.

Shaping Alaska's History

Deadly Catch

The wildly lucrative Bering Sea crab fishery had a not-so-hidden secret. Taking place during the fall and winter months when weather was notoriously bad and icing conditions were severe, the race for Bering Sea crab was deadly. Vessels overloaded with crab pots capsized and crewmen were swept overboard by waves. According to the National Institute for Occupational Safety and Health, the Bering Sea crab fishery had a workplace mortality rate that was 50 times the national average and the highest in the nation. The danger was popularized on television on the Discovery Channel's "Deadliest Catch."

"You know, when you have these open access, go-full-out fisheries and everybody is out there trying to get as much as they can, no matter what the weather and no matter what happens, a lot of safety was compromised," remembered Bering Sea crab manager Ken Griffin. "We lost a lot of vessels and we lost a lot of people including some who were very close to me and my family, personal friends."

Such as the 14 crewmembers aboard *Americus* and *Altair*, twin crab boats considered the "Cadillacs of the Fleet," but which suddenly capsized in relatively light seas in 1983 and went down with all on board. Improper loading and modifications to the vessels were later suspected for their loss, which happened so suddenly neither vessel even issued a mayday.

Following a Congressional directive and years of debate, the North Pacific Council finally devised a Bering Sea crab rationalization program that included elements of the earlier plans for salmon, halibut and pollock. First, a license limitation program in 2000 capped the effort, later IFQ shares were distributed



to vessel owners and captains based on their catch history. Lastly, like the American Fisheries Act, the crab plan allowed formation of cooperatives.

Crab rationalization went one step further and linked most of the IFQs to individual processors. Processor shares were considered necessary to protect the companies' investments in the remote processing plants but prompted a fierce debate that spread from the fish docks in Alaska to Washington D.C. The Justice Department opposed processor shares arguing they were a disincentive to innovate. Arizona Senator John McCain also spoke out against processor shares, saying they "throw an enormous wrench in the free market machinery."

Despite such strong opposition, the crab rationalization plan ultimately passed in 2003. In its first

year the fishing fleet shrank from 251 vessels to just 89 and the fishing season grew from 3 days to 93. The fishery also became safer. There have been no deaths in the industry since crab rationalization, although some credit increased Coast Guard outreach and safety inspections.

Crab rationalization remains controversial today. Crewmen say they were not compensated for the loss of fishing jobs and ports like Kodiak and King Cove suffered from fewer deliveries and processing work.



Crab fishing in the Bering Sea. Above left: Forrest Bowers, ADF&G. Below right: Photo courtesy of ASMI.

Opponents of what they derisively called "crab ratz" pushed for a review of the program which is still ongoing. But Senator Ted Stevens, who was instrumental in its passage, had no second thoughts.

"A lot of people are upset by my support of rationalization but I'm proudest of the fact that we've eliminated the race for the fish," said Ted Stevens. "I think that caused us a high level of deaths. They make a big thing about it on TV but it's no longer the most dangerous occupation in the country."