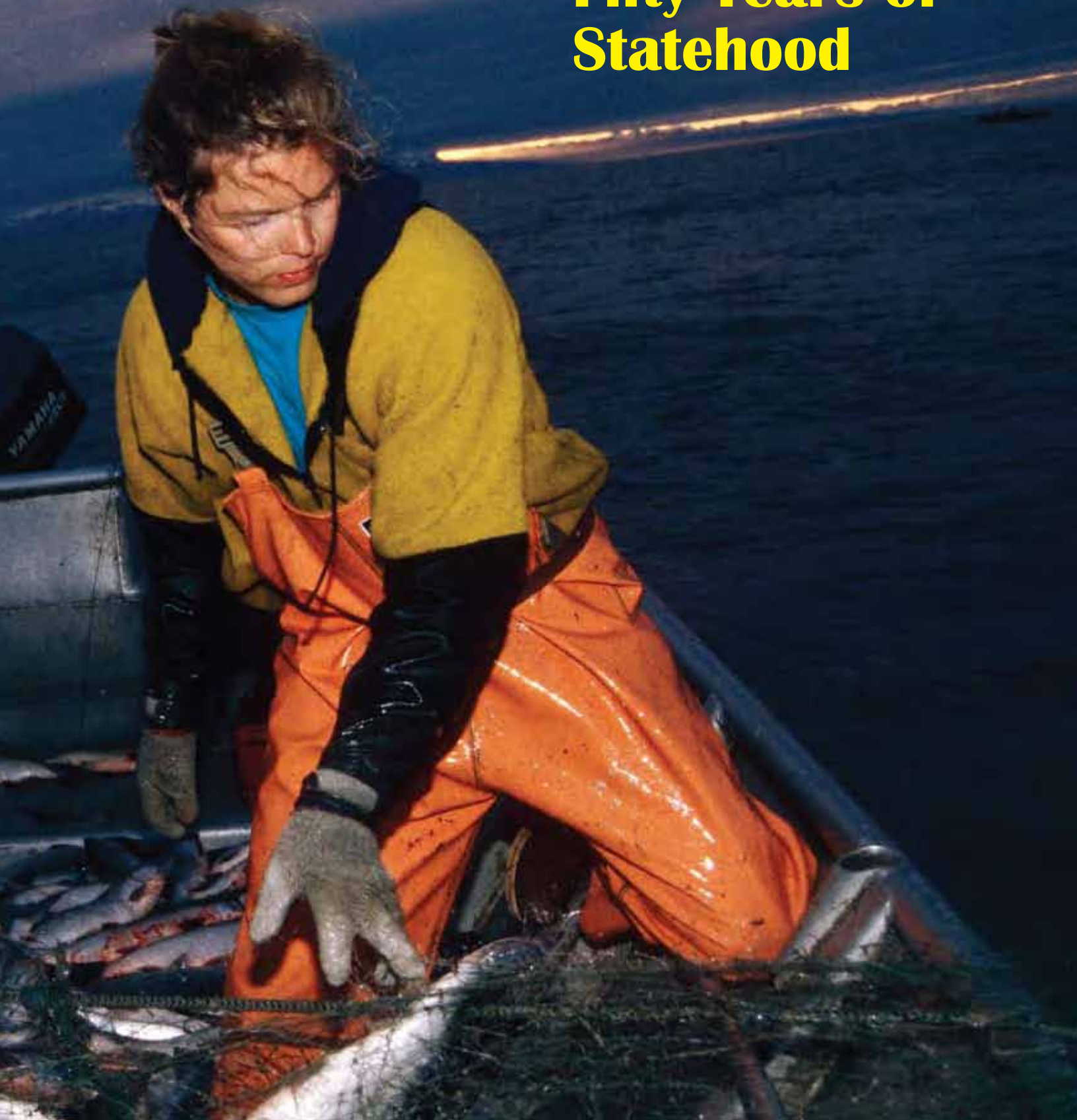


Sustaining Alaska's Fisheries: Fifty Years of Statehood





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Alaska Department of
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Introduction

Denby S. Lloyd, Commissioner
Alaska Department of Fish and Game



It's my honor and privilege to introduce this volume on the management of commercial fishing in Alaska, in celebration of Alaska's 50th anniversary of statehood. Alaska's harvest of salmon, halibut, crab, pollock and other species constitutes a major portion of our economy

and forms the foundation of much of our social structure. And, it was the need to ensure the sustainability of our fisheries, and to secure local control of their management, that supplied much of the drive for statehood.

An essential element of our fishing industry is a management system that uses the best science available to keep species and stocks healthy, while allowing for harvests sufficient to support local communities and businesses. Based upon the vision of our constitutional convention half a century ago, Alaska's fisheries management has become widely recognized as some of the best in the

world. Many of the original principles of sustained yield, local area management, and public participation in the regulatory process

that are the hallmark of the state's management program have been adopted by federal managers for the marine fisheries off Alaska's coast as well.

I am proud to have worked throughout my career as a researcher, manager,

and administrator for Alaska's fisheries. Like many of our state scientists, I've enjoyed the rewards and challenges of working closely with stakeholders, fishermen, processors, community leaders, and advocacy groups. And, after fifty years of successful, sustainable management, the industry appears to have developed a great deal of trust in Alaska's management policies and decisions. Our commitment is to keep Alaska's fisheries wild and sustainable.

To mark the 50th anniversary of Alaska's statehood, we asked Bob King to write this engaging history of our commercial fishery management heritage. Bob, a former journalist who covered the fishing industry in Bristol Bay for many years and later served as press secretary to the Alaska Governor, has a wealth of knowledge of the people and events that have shaped Alaska's fisheries over the last fifty years. In researching this history he interviewed many of the biologists, leaders and Alaska citizens who contributed to this story. I hope you enjoy this book, as a resource and a reminder of the visionary pioneers, scientists, and leaders who have been a part of developing Alaska's amazing commercial fisheries. The stage is set for keeping our fisheries wild and productive, sustaining ways of life and livelihoods for generations to come.

A handwritten signature in black ink that reads "Denby S. Lloyd".



Right: Commissioner Lloyd gillnetting off the Copper River.
Photo courtesy of George Covell.

Left: Commissioner Lloyd in front of Dawes Glacier in Endicott Arm as part of a seal research trip.
Photo courtesy of Gail Blundell.

Opposite page: Transferring fish to a tender.
Photo courtesy of Bob King.



Starbound

Alaska history has been profoundly shaped by fish. Its abundant marine resources helped sustain the first humans who crossed from Siberia to the Americas. Vitus Bering, who first charted Alaska for the Russian Tsars, depended on the sea as well. “Fish oil was his butter, and dried fish his beef and pork,” it was said of Bering. British Captain James Cook came to Alaska in search of the fabled Northwest Passage; instead he found one of the richest fisheries in the world. Watching fish jump in the waters around his vessel, he wrote in his logbook, “It must abound with salmon,” and gave it the name Bristol Bay.

Commercial fishing interests were among the most vocal supporters of purchase of the territory from Russia; while others decried it as folly, people in the seafood business knew that Seward’s icebox was packed with salmon and cod. Canned salmon later emerged as the new territory’s first major industry and by the 1930s played the role that oil does today, generating the vast majority of the territory’s revenues. But the salmon packers’ reliance on fish traps drove a wedge between the industry and the Alaska population that pushed the territory toward statehood.

The pace toward statehood accelerated after World War II; as Alaskans returned from overseas deployments, GIs sought adventure in the northland and communities grew around the wartime investment in new roads and airports. Wanting to assert more control over the economy, the Territorial Legislature created the Department of Fisheries and the first fish board in 1949 so residents had a bigger say in its biggest industry: commercial fishing.

But that industry was in serious trouble. The industry was highly dependent on salmon. Mostly canned, salmon accounted for 70 percent of Alaska’s annual catch of fish by weight and 90 percent of its value. Herring made up most of the remaining volume and halibut was a distant second in value. And salmon runs were failing.

Salmon production peaked in 1936 when 130 million salmon were caught throughout the territory. The runs that followed, however, began a steady decline. In the 1950s Alaska salmon runs were declared a federal disaster.

Several reasons were likely to blame. Lax federal management and a lack of basic research

into salmon runs were surely factors. Federal law required half of all runs escape upriver to spawn the next generation, but nobody really counted. Wartime demand for protein resulted in an overharvest of Alaska’s salmon runs which steepened the decline. Long-term fluctuations in climate, later known as the Pacific inter-Decadal Oscillation, also undoubtedly played a role.

The Territorial Department of Fisheries had some early success. In 1951, it helped overturn

Left: Spawning salmon.
Photo ADF&G.

territory of Alaska 19 9 Extraordinary session House of Representatives, 19th session. Front row (l. to r.): Keating, Warren Taylor, Doris Barnes, Jack Conright, Stanley McCutcheon, Amelia Gundersen. Second row (l. to r.): George Miscovich, Slim Rydeen, Frank Angerman, Frank L. Johnson (Eskimo), Percy Ipalook, Almquist. Third row (l. to r.): Glen Franklin, Mark Jensen, Dr. Pollard, Wm Beltz, Andrew Hope, Frank G. Johnson (Tlingit). Fourth row (l. to r.): Red Carlson, John L. Heddy (Clerk), Mary Moore, Mildred Hermann, Abel Anderson, Essie R. Dale. Fifth row (l. to r.): Reporter, Jim Nolan, Jack Carlyle.
Photo courtesy of the Alaska State Library Portrait File, Alaska State Library Photograph Collection.

an outdated federal law that required Bristol Bay fishermen use sailboats and the number of fish traps was gradually reduced. But a new threat emerged on the high seas in 1952 when Japanese fishing fleets were allowed to operate in the Bering Sea and western Aleutians. Permitted by a treaty governed by the International North Pacific Fisheries Commission, the fishery was intended to help rebuild Japan after the war. It took a significant number of Western Alaska salmon, particularly from Bristol Bay. Alaskans protested the high seas interceptions but as postwar tensions grew with the Soviet Union, the United States increasingly needed Japan as a strategic ally. Salmon had become a bargaining chip in the geopolitics of the cold war.

Alaska's dwindling salmon runs and long-standing resentment over fish traps combined in 1955 when delegates from across Alaska came together to write a state constitution. Former Governor Ernest Gruening delivered an opening keynote address in which he offered an obituary for the salmon industry. The previous summer's harvest, he noted was the poorest in 46 years,

a tragedy for Alaska fishermen and fishing communities. Gruening put the blame on Alaska's treatment by the federal government.

"It is colonialism that has both disregarded the interest of the Alaskan people and caused the failure of the prescribed federal conservation function," Gruening said. "Colonialism has preferred to conserve the power and perquisites of a distant bureaucracy and the control and special privileges—the fish traps—of a politically potent absentee industry."

The work produced by 55 Alaskans that winter later became regarded as a model constitution and it uniquely included key provisions intended to preserve Alaska fisheries: reserving



The vintage 1962 Alaska Fish and Game logo above was updated in 1978.

fish as a common property resource, providing for principles of sustained yield management, and prohibiting any exclusive right of fishery.

Alaska's Constitution paved the way for statehood that finally came in early 1959. The state immediately recruited young biologists to take over the federal jobs, but the transfer wasn't easy. "There were a lot of difficult feelings between the Fish and Wildlife Service and ADF&G," remembered Steve Pennoyer, hired in 1959 and assigned to the Arctic Area, now known as the Arctic-Yukon-Kuskokwim. "We'd go into a village like Rampart or Tanana or



Delegation celebrates Alaska's Statehood by posing in front of a 49 star flag. Identified are Representative Ralph Rivers (far left), Ernest Gruening (beneath flag) and Bob Bartlett (next to Gruening in light colored suit).

Photo courtesy of the Ernest H. Gruening Papers, 1914-[1959-1969] 1974, Archives, Alaska and Polar Regions Collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks.

Nenana and have a meeting and they would push me up in front of the room and say, 'Well these guys are in charge now so don't burden me with any of your problems. It's their problem now.' And of course I didn't know anything. I didn't know where the hell I was."

The salmon industry flexed its muscle one more time and secured a provision in the statehood act that delayed transfer of authority to manage fisheries until the new state demonstrated its ability. The industry expected that might take five years, during which they could still use their traps. But bowing to the will of the Alaska public, fish traps were banned immediately and the new Alaska Department of Fish and Game (ADF&G) was certified to take over fish management the very next year.

Change couldn't come soon enough. The decline in Alaska salmon continued. By 1959, salmon runs had deteriorated to the point that federal fishery managers ordered Bristol Bay to be closed entirely. Coming as foreign fleets continued to intercept the same salmon on the high seas, Andy Anderson was incensed. "Bristol Bay people depend upon the salmon fisheries almost entirely for their existence," he said. "No sacrifices should be made by these people so as to benefit the Japanese high seas fishery." After fishermen appealed directly to President Eisenhower, a limited fishery was finally allowed but when the

season was over, the harvest of salmon across the new state had slumped to just 25 million salmon. The last year of federal control produced Alaska's worst salmon harvest since 1900.

Above: Prepared for Alaska's Constitutional Convention, this graph depicts the status of Alaska's fisheries as delegates envisioned statehood. After peaking in 1936 at over 900 million pounds, fish production had dropped by over two-thirds and was continuing to fall. Canned salmon accounted for most of the fish production during Alaska's territorial days with herring second in terms of volume and halibut second in value.

Shaping Alaska's History

The Giant Octopus

Nothing symbolized the absentee control over Alaska's resources quite like the fish trap. Not the ingenious baskets woven from alder branches by Alaska's Native peoples to ensure a subsistence harvest, these were industrial-scale traps built by the salmon packers from wood piling and wire fencing. Driven into the river beds or suspended from floating frames anchored along the outer capes, fish traps were impressive harvesting machines, mazes of steel mesh with long arms that stretched into the migration path of the salmon. From there, the salmon were herded into two heart-shaped corrals which emptied into a holding pen or "pot." There trapmen scooped salmon out by the thousands into tenders that hauled the bounty to nearby canneries.

There was no doubt about the traps' efficiency. One early fishery agent described traps as a "giant octopus that grasps everything in its tentacles." There were fears that traps could effectively destroy an entire salmon run. Even worse for Alaskans, they also took jobs away

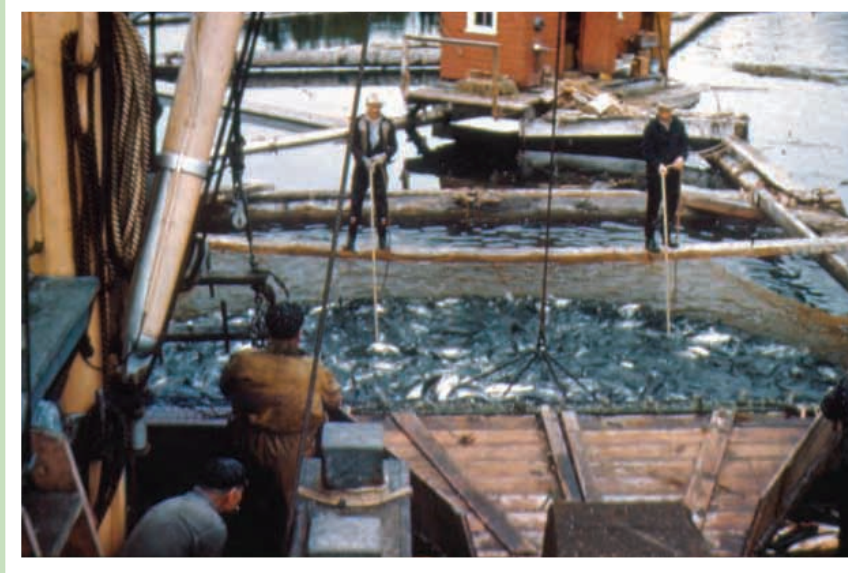


Photo by Dora M. Sweeney, courtesy of Alaska State Library Photograph Collection.

from resident fishermen. "In its very essence a fish trap is a monopoly, a special privilege," said Alaska delegate Anthony Dimond. "It is not possible for the fisherman who catches the fish with any other device to make a living."

Such concerns over fish traps were nothing new. Fish traps were banished in England by the Magna

Carta in 1215. By the 20th century traps were banned in California, Oregon, Washington, and British Columbia but they flourished in Alaska. At their peak, almost 800 traps were used throughout the territory and landed two-thirds of Alaska's salmon.

Alaskans fought the fish traps from the very beginning. The first territorial legislature called for restrictions on trap use in 1913. By the 1930s, talk had turned to phasing the traps out. In 1948, Alaskans voted seven-to-one to eliminate them entirely.

Over the years, the number of fish traps in Alaska waters had been pared back to around 400, but to Alaskans the traps remained a despised symbol of outside control of the territory that inflamed Alaskans desire for statehood.

Alaskans view a model of a fish trap, described as "Alaska's Enemy No. 1," prior to a 1948 advisory vote. During the October election, Alaskans voted against traps by a seven-to-one margin.

Photo courtesy of the Russell W. Dow (1915-1992) Papers, University of Alaska Anchorage, Consortium Library, Archives and Special Collections.



Shaping Alaska's History

Real World Economist



George Rogers.
Photo courtesy of the Alaska State Library
Photograph Collection.

When George Rogers studied economics in college, he was frustrated by his fellow students who knew all about economic theory but didn't know the basics of bookkeeping. Rogers considers himself a real world economist. Growing up in California during the depression he had to be. Fresh out of high school in the 1930s, he needed a job. Standard Oil recognized his aptitude for numbers and hired him as a statistician.

When the war broke out, Rogers was passed over for the draft due to a leg injury, so he went to college and earned a degree in economics. A government job took him to Alaska. The Office of Price Administration controlled prices during the war, but didn't include fish, which wasn't considered an important part of the national diet at the time. It was to some. "The Department of the Army said, 'Look, we've got Catholic boys who expect fish on Friday and the price has gone so high we can't afford to buy them that.'" Rogers recalled. "They told me, 'We want you to roll back the price of raw fish.'"

It was an impossible assignment Rogers admits, but it got him to Alaska at a time of dramatic growth. The potential of the territory caught Rogers's attention and he caught the eye of Alaskans. Governor Ernest Gruening asked him to stay and gave him assignments from revising the tax code to helping organize the Territorial Department of Fisheries. His work in resource economics earned him an invitation to the Constitutional Convention.

"Fisheries was the key to statehood all along and Ernest Gruening recognized that," Rogers said. "First of all you had the fish traps. They were the big bugaboo: owned by outside interests and taking jobs away from Alaskans. And the federal government had done a lousy job managing fisheries. I referred to Alaska as the farthest north banana republic because it was controlled by the canned salmon industry."

As a consultant to the constitutional convention Rogers helped write the natural resources section



The canned salmon industry wielded enormous influence in Alaska.
Photo ADF&G.

"Fisheries was the key to statehood all along and Ernest Gruening recognized that."

—George Rogers

with its provisions for common property and sustained yield. The constitution did not ban traps outright. It set out broad principles and goals and tended to avoid such micromanagement but language that prohibited special fishing rights underscored the intent of its framers. And just to make sure, they called for an advisory vote to ban traps that was part of the Constitution's ratification.

"They were tied together and that was critical. It helped get out the vote," Rogers said. "I don't think we'd have gotten the constitution approved by the general population unless they had some gimmick like that to bring them in." The ploy worked. When put before Alaska voters for ratification in 1956, the constitution passed by a two-to-one margin. The vote against fish traps that year passed five-to-one.

George Rogers went on to a distinguished career as an Alaska resource economist, later advising the International North Pacific Fisheries Commission and North Pacific Fishery Management Council, writing several books on Alaska's natural resources, always with his feet firmly planted in the real world.

Shaping Alaska's History

Territorial Department of Fisheries

Before Alaskans ever called a constitutional convention, they created a Department of Fisheries. Passed by the Territorial Legislature in 1949, the goals of the Department were to better conserve the fish resource and “overcome the present depleted condition of the salmon runs,” foster resident ownership, management, and control of Alaska fisheries and, lastly, to cooperate with the federal fishery managers. Actually, they were not in a particularly cooperative mood.

“The people of Alaska just last year voted overwhelmingly in favor of the elimination of fish traps for capturing salmon for the general

economic welfare of Alaska as well as the proper management of salmon,” the Department said in its first annual report and called on the federal Fish and Wildlife Service to rid the territory of traps.

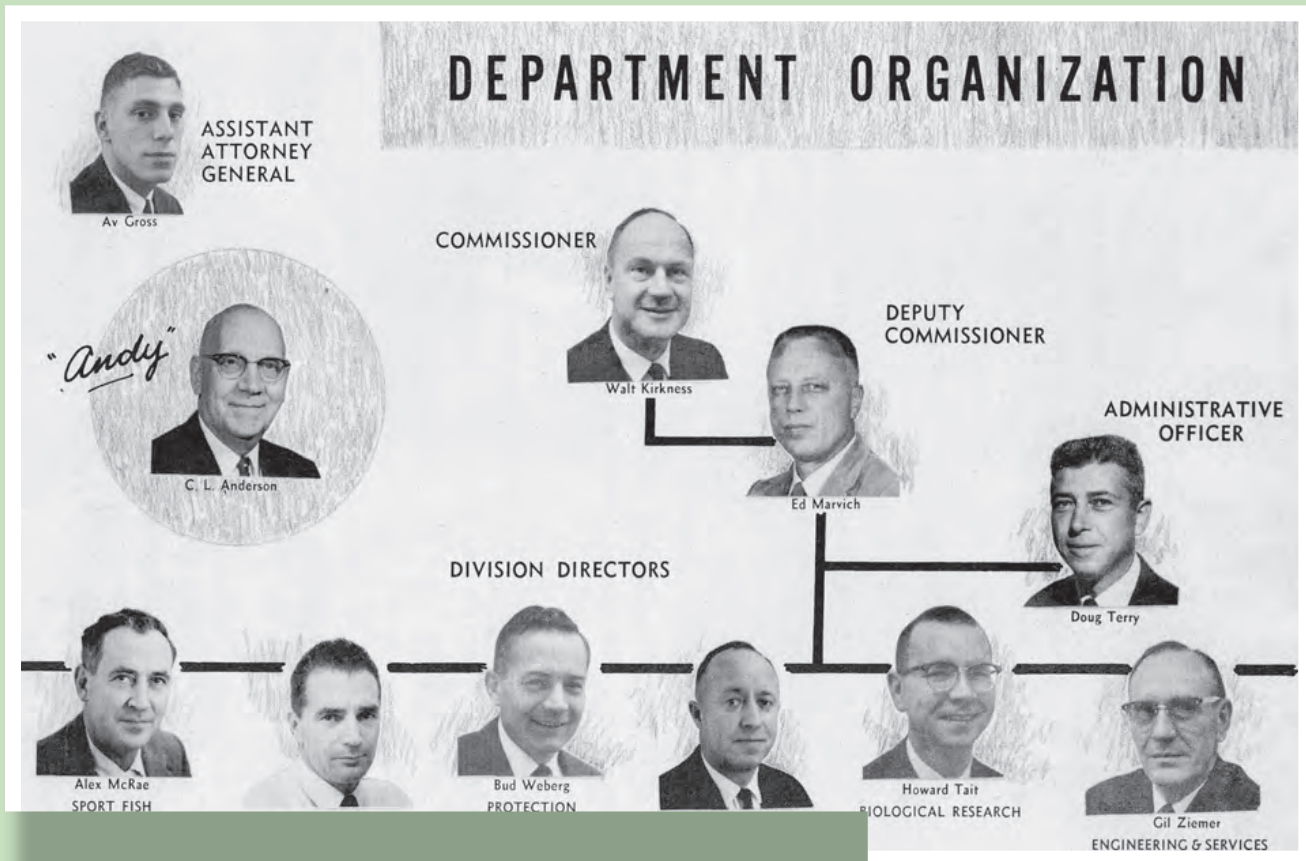
They fought regulations seen as discriminatory against resident Alaskans such as the requirement that Bristol Bay fishermen work from sailboats. “None of these sections can be justified on conservation grounds,” the Department railed. “The safety of the fishermen has been entirely overlooked.”

They demanded that Alaskans have a voice in fishery regulation. “It has been our practice to meet with the fishermen and discuss these

problems and get their reactions to them,” said Andy Anderson. “I have

...the goals of the Department were to better conserve the fish resource and “overcome the present depleted condition of the salmon runs”

—Department of Fisheries



The first organizational chart of the Alaska Department of Fish and Game honored Andy Anderson for his work in forming the Department during territorial days. Photo ADF&G.

Shaping Alaska's History

been around this game for a long time and my impression is that the fishermen are more conservation-minded than most of the rest of them, including the packers.”

The change sought by Alaskans was slow to come. The salmon packers still held a powerful sway over federal fishery managers. But the Territorial Department of Fisheries and the Territorial Fish Board emerged with a steady voice and a clear vision for the future.

“The rate of development of the Alaska Department of Fisheries will be dependent upon the speed with which statehood is achieved,” they wrote. “By good management and cooperation of all people and companies concerned there is no reason why Alaskan fishery products cannot be diversified and increased in volume and quality until they become world famous.”

They were right. And they had the right man to lead them, Clarence L. Anderson. Alaskans knew him as Andy.



A.W. Winn Brindle next to scow full of fish at Wards Cove Packing Company salmon cannery in Naknek.

Photo courtesy of the Wein collection, Anchorage Museum at Rasmuson Center, Library and Archives.



The change sought by Alaskans was slow to come. The salmon packers still held a powerful sway over federal fishery managers.

Sockeye salmon being offloaded onto a cannery conveyor in Bristol Bay, 1954.

Photo courtesy of the Anchorage Museum at Rasmuson Center, Library and Archives.



Taking Control

Alaskans viewed the transfer of fishery management in 1960 as more than just a step toward the sovereignty guaranteed by Statehood. “It is a requirement toward remolding the shattered remnants of a once unparalleled fishery which, under distant bureaucratic control, has been in sharp decline for more than two decades,” said Governor Bill Egan. “Now for the first time, Alaskans are free to exercise their own judgment on a course of action to rebuild this resource in the common good to its earlier position of eminence.”

But the salmon canners were reluctant to lose the influence they enjoyed during the territorial days. One of the packers told Chuck Meacham Sr., then supervisor of Fish and Game’s Central Region, that the new state should manage its fisheries Greyhound style. “I thought, what the hell are you talking about, ‘Greyhound style’?” Meacham recalled. “They said, ‘You know, leave the driving to us.’”

That wasn’t an option. Instead, Bill Egan told Andy Anderson, the first commissioner of the Department of Fish and Game to do whatever it took to restore salmon runs to their former abundance. Anderson boosted basic research into inventorying fish stocks, better understanding their life histories, studying habitat, and improving forecasting techniques. New methods for counting fish entering the spawning grounds were put into place so decisions on fish openings were made based on hard data, not educated guesses.

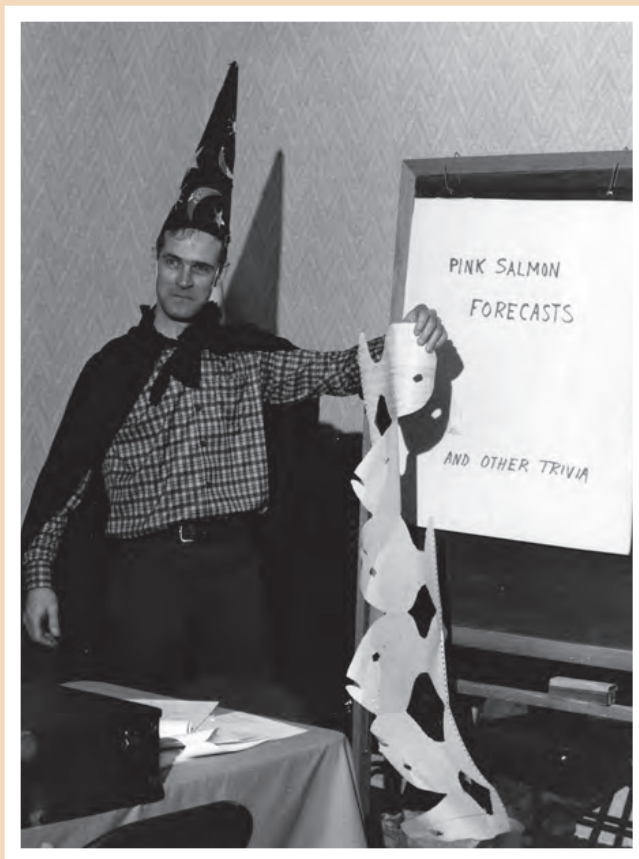
The state scrapped the federal timetable which set fishing periods months in advance based on run expectations. Instead, the state allowed openings based on actual run strength and only when enough salmon reached the spawning grounds to sustain production. Anderson took the statehood idea of local control one step further, giving local fishery managers the authority to set openings through what were called emergency orders.

“Andy passed that authority on to his biologists,” Meacham said. “We had the authority to open and close and make emergency regulations and we didn’t have to go any further than ourselves. They didn’t have to be issued at any set time or sent to the attorney general or anything else. We had local control of our fisheries.”

Salmon jumping up the falls, returning to their birthplace.
Photo courtesy of ASMI.

“We had the authority to open and close and make emergency regulations and we didn’t have to go any further than ourselves.”

—Chuck Meacham Sr.



An early forecasting technique illustrated.
Photo ADF&G.

The new style of management didn't sit well with everyone. Some fishermen missed the regularity of having weekends off during the federal days. Others complained about the "wishy-washy, on-off pattern" of openings. But when the Department reacted quickly to an unexpected strong salmon return to Bristol Bay, the trade press praised Fish and Game's "vigorous on-the-job, on-the-spot, on-the-ball policy of fishery administration."

Salmon runs generally improved in the 1960s, with catches of 40 to 60 million salmon annually but serious problems remained. Bristol Bay production fell into a five-year cycle of booms and busts. When sockeye runs slumped in 1962 and 1963, the state asked President Kennedy for disaster assistance. The harvest soared in 1965 only to collapse again two years later. Pink salmon production was also erratic peaking at over 160 million pounds in 1966 and dropping to less than 30 million pounds the next year. Meanwhile, Japanese fishing fleets continued

to catch millions of Alaska salmon on the high seas.

Salmon still dominated Alaska's seafood production with halibut and herring distant seconds in terms of value and poundage respectively, but in the 1960s, a new fishery emerged.

Following World War II, a Seattle entrepreneur named Lowell Wakefield began exploring Alaska's little-used king crab resource. He had a reputation as a "blood and guts guy," someone who could make anything work through his sheer determination and hard work. Marketing was a secret of his success. Rather than put the crabmeat in cans, Wakefield froze the crabmeat in sections. He operated one of the first catcher processor boats that allowed him to explore

waters off the Aleutians, Alaska Peninsula, and Kodiak and he built shore plants at Seldovia, Cordova, and Sand Point.

*...in the 1960s,
a new fishery
emerged.*



Crab boats on ice.
Photo by Forrest Bowers, ADF&G.

With the passage of statehood, the rules of the crab fishery changed. The new state required fishermen to use crab pots instead of trawls or tanglenets, which the Department considered too destructive. Just over the three-mile limit, the Japanese and Russian fleets were still free to use whatever gear they preferred. Tensions grew when the foreign fleets destroyed Alaskan's pots with their nets.

Not much was known about king crab at the time. "When Clarence Anderson called me and said, 'Hey, how would you like to come up to Alaska,' the first thing I did—I'm in college in Colorado—was go to the library," said Guy Powell, the state's first crab biologist. "I looked up king crab and the only thing I could find was *Limulus*, the horseshoe crab with a big rat-like



ADF&G biologist Guy Powell used scuba diving gear as a research tool.
Photo ADF&G 1959 Annual Report.

tail and which is also called the king crab. Basically I learned almost nothing was known about king crab back in '58."

When he arrived in Kodiak, Powell put on his scuba gear

and went to work studying king crab in their natural habitat, documenting their migrations, molting, and mating patterns, sometimes holding the crab in corrals to study their life cycle. Powell came to be known as "the world's only

Powell came to be known as "the world's only underwater cowboy" for his scuba work and he was pretty much on his own.

underwater cowboy" for his scuba work and he was pretty much on his own. "We had a saying back then that it really was 'Alaska Department of Salmon,'" Powell said. "In the early days, salmon was king and these other fisheries were nothing. The king crab fishery was managed by salmon biologists in their spare time."

King crab was about to be noticed. Led by Wakefield and soon joined by others in the industry, crab catches doubled every two years after statehood, from less than 20 million pounds in 1959 to over 40 million in 1961 and almost 80 million in 1963. "The communities of Sand Point, Unalaska, and King Cove are bursting at the seams," the Anchorage Daily News reported. "It's go-go all the time."

Kodiak also saw a surge in its king crab catch. In the winter of 1966, less than two years after being devastated by the Good Friday earthquake, Kodiak's king crab catch surged to 96 million pounds. Combined with catches in the Bering Sea, the harvest totaled 159 million pounds. Alaska's first king crab boom soon faded, but a new major fishery had emerged off Alaska, one that would take an increasingly prominent role in the decades to come.



King crab on deck.
Photo Jim Craig, ADF&G.

Shaping Alaska's History

Andy

Alaska's first commissioner of Fish and Game, Clarence Louis "Andy" Anderson divided his early life between Seattle, where he was born in 1894, and Dawson in the Yukon Territory where his father ran a gold rush era trading company. He studied fish biology at the University of Washington where he earned his bachelor's and master's degree. His thesis was on pickled fish and he went to work for the U.S. Bureau of Fisheries demonstrating a new method to preserve herring known as the "Scotch cure."

Anderson jumped into the private sector, running a Seattle smokery for several years, but returned to public service in 1942. He joined the Washington State Department of Fisheries where he promoted the commercial viability of its marine resources. He regularly returned to the University of Washington to lecture on marine fisheries and preservation methods.

In 1949, Anderson was called to Alaska as the territory's first director of fisheries. Over the next decade, he built the Department from a single-room office in Juneau to a department with field offices across the territory and over 170 employees. With the coming of statehood and control over fish management, Governor Bill Egan gave Anderson a simple order: to rebuild Alaska's salmon runs, no matter what it took.

With a management strategy that places control at the local level, Andy Anderson looked to his field biologists to carry out that order. As recalled by Clem Tillion, Anderson told them, "Gentlemen, the governor has instructed me to return the salmon runs to their former abundance regardless of the pain that is inflicted on the people. I'm charging each one of you to make sure every

stream in your district is filled to the maximum spawning capability. Now, if you allow an overescapement, depriving the fishermen of their livelihood, you can expect to be criticized. But on a personal level, gentlemen, I want you to understand that if you allow an underescapement, you can expect to be fired."

It's not known if any biologists were ever actually fired. Anderson's managers took his charge to heart which, as Andy predicted, sparked criticism for the young Department. Commercial and sport fishermen howled in protest when Cook Inlet was closed to king salmon fishing. Chuck Meacham Sr. recalls packer Winn Brindle throwing down his hat and stomping on it when the Department once refused to open Bristol Bay.

Andy Anderson never lived to see the success his direction would ultimately produce. He retired from the Department in 1961 and died five years later. For his years of service during the transition to statehood, Andy Anderson is affectionately known as the "Father of the Alaska Department of Fish and Game." For taking a principled stand for conservation, Clem Tillion calls him the "savior of Alaska fisheries."



Clarence Andy Anderson.
Photo ADF&G.

"...on a personal level, gentlemen, I want you to understand that if you allow an underescapement, you can expect to be fired."

—Clarence "Andy" Anderson

Shaping Alaska's History

The Fish Board

Fish traps may have been the symbol but it was outside control of their fisheries that really drove Alaskans to push for statehood. In territorial days, fishing regulations were largely made in closed meetings between federal regulators and the salmon packers. Alaskans had little, if any, say in what was decided. Andy Anderson had a better idea.

"We take a little different approach to the problem than perhaps a federal agency does because we feel that the people of Alaska should have something to say about this," Anderson said. Along with the Fish Commission, the Territorial Legislature also created the Fish Board with five members: three fishermen, a processor and one member from the general public. In its early days, the board was only advisory and its recommendations were often ignored but with statehood, the board was vested with the power to set regulations. It initially grew to a ten-member board that regulated both fish and game before being divided into two separate boards. Whatever its composition, the idea of giving fishermen the power to regulate their industry was revolutionary.

"Before I got on the Fish Board I was an alternate on the Pacific Salmon Commission and I don't know how many times people came up and said they were fascinated that we were able to have this kind of citizen participation," said former board member Gary Slaven from Petersburg. "Especially the Canadians; almost everyone on the Canadian delegation, sooner or later, that was what they wanted to talk to me about."

Under statehood, the process of citizen involvement devolved even further with the creation of Fish and Game Advisory Committees that encouraged greater participation at the local level, but democracy wasn't always easy. As it worked through its agenda, the Fish Board wrestled

with contentious allocation disputes such as conflicts between commercial and sport fishermen in Cook Inlet and between commercial fishermen from different regions such as the mixed stock fishery in the Eastern Aleutians' Area M. The board also struggled with ethical concerns of giving a lay board such regulatory power, at times going too far for some.

"The idea behind it was trying to keep politics out of it as much as possible and utilize the knowledge people have about different fisheries and that's a real good process," said former board member Dick Jacobsen of Sand Point. "The downside is they tried to be overly conservative on conflicts of interest. Information gets lost if a board member isn't allowed to participate in the discussion on areas they know a lot about. That part I think is wrong. I can see somebody not being able to vote on issues that concern their own area, but they should be able to put their knowledge on the table and allow other board members to utilize it."

Most board members took their responsibility seriously and the process brought a broader perspective

for the good of the resource and the state. "When they hear such and such a person with a particular gear type is going to get on the Fish Board, some people think, 'Oh, that person will just be there for one agenda.' Well, it really is a thankless task if you have that attitude," said Gary Slaven. "What I saw was that most people weren't there very long before they realized that they were going to learn a lot about a lot of different things, make some really tough decisions and they had to pay attention. Either that or they didn't last long. They weren't happy or it was too much work."

"It's kind of like growing up in Alaska," is the way former board member Robin Samuelsen put it. "If you're an athlete on a high school basketball team like I was in Dillingham, you travel around the state and meet people who become friends for life. On the Board of Fish, I made new friends all around the State of Alaska. I'm sure I made enemies too; in fact I know I did, but if they know you're doing hard work and trying to be fair, they'll respect you. And that's a real rewarding experience."



Members of the first Alaska Fisheries Board in 1949. L to R, J. Howard Wakefield, Port Wakefield; Ira Rothwell, Cordova; J.P. Valentine, Ketchikan; William R. Walton, Sitka; and Karl Brunstad, Kodiak.
Photo Alaska Department of Fisheries 1949 Annual Report.

Shaping Alaska's History

Flying for Fish

No tool is perhaps more valuable to a salmon biologist than a Cessna 180 or Piper Super Cub. Aerial surveys are sometimes the only way to count fish to ensure there's adequate escapement to sustain the runs and identify the extent of spawning habitat.

Before he even had an office, newly hired biologist Steve Pennoyer was put in an airplane. Dropped off in Aniak in 1959, he was told to find the Kuskokwim sockeye salmon. "I had never flown an aerial survey," Pennoyer recalled. "They told me, 'Well, it's easy. Just go up in the air, count fish and if they're red it's a sockeye.' Okay. Well, the pilot's nickname was 'Crackup Harry.' He had left a plane on nearly every mountaintop along the Kuskokwim. Harry had never flown a survey either so there we were flying up and down the river. We never did find those

damn sockeye that year but I found them later."

"I remember doing stream counts in Kodiak in the 60s," said biologist Larry Edfelt. "Dave Henley was the pilot. He was the guy who had the Super Cub with a machine gun mounted on it for bear control. Henley was a great pilot. When he flew, the plane and Henley were one and the same. The thing that bothered me was I'd be counting fish, the plane would roll sideways one way and then roll the other way and I looked at Henley and he was counting too. Nobody's looking straight ahead. 'Dave, let me count, you fly.' It scared the hell out of me."

Aerial survey information is especially important in fast paced fisheries like the Bristol Bay salmon season which lasts just a few weeks but it's not easy in the Bay's turbid water. Mike Nelson started a long

"They told me, 'Well, it's easy. Just go up in the air and count fish and if they're red it's a sockeye.' Okay. Well, the pilot's nickname was 'Crackup Harry.'"

—Steve Pennoyer

career in Bristol Bay management in 1962 and had to innovate techniques to count fish in muddy water. "I used to fly two, sometime three times a day," Nelson said. "I was in the air all the time looking at specific points. Like if you go out to the head of the channel, right at the turn of the tide when it goes slack water, the fish go nuts. They jump every which way because they've lost their directional push."

Nelson learned to look where the fish weren't expected. Salmon usually follow the river banks but not always. "One time I flew up Wood River, the lower third of the river, and I thought I saw something out in the middle. I flew out there and, my god, I've never seen so many fish in my life. It turned out to be 500,000 salmon. So I started making aerial survey flights at those conditions and stages of the tide when we needed to know what we've got in the muddy water."

Among the colorful bush pilots who flew Department biologists were some who achieved later



Left: Aerial view of sockeye salmon.
Photo John H. Clark, ADF&G.

Shaping Alaska's History

fame, like a pilot from Naknek named Jay. "Frankly, he wasn't much of a stream survey pilot," recalled former Bristol Bay manager Ken Middleton. "The problem with Jay was he was always thinking about other things. His mind was constantly churning about the welfare of the Bristol Bay Borough, the state, the fisheries, the people; you know, political things. That and his floats were always leaking. He never did get the damn things fixed during the season. We had some hairy takeoffs. Sometimes we had to go back, run it onto the beach, pump the floats out and try again. But Jay was an outstanding guy in my opinion. He had a hell of a mind on him." Bush pilot and salmon setnetter Jay Hammond later became the State of Alaska's fourth Governor.

Flying aerial surveys wasn't sightseeing. Alaska's weather and rough terrain made the work dangerous. "I flew in nine airplanes that crashed within 24 hours after I was in them," remembered Larry Edfelt. "I was the last person to fly alive with two pilots, survived a helicopter crash on Chignik Spit, and was in two airplanes that ran out of gas in the air. That kind of stuff was happening all the time. But that was Kodiak and I was young and immortal."

While counting salmon near Quinhagak in 1962, an airplane crash took the life of a young ADF&G biologist, the pilot and a state electronics technician. Lester Varozza was the first Fish and Game biologist to die in the line of duty. In the 50 years since statehood, 25 ADF&G employees have lost their lives in the course of their work, many in airplane accidents while flying for fish.

"The problem with Jay was he was always thinking about other things... the welfare of the Bristol Bay Borough, the state, the fisheries, the people; you know, political things. That and his floats were always leaking."

—Ken Middleton



INAUGURAL
PROGRAM
1975

Gov. Hammond and Lowell Thomas Jr., January 18, 1975.

Photo courtesy of the Alaska Inaugurations collection, Alaska State Library, Historical Collections.

Left: Gov. Hammond at Little Norway Festival, Petersburg. Photo courtesy of the Office of the Governor Photograph Collection, ca. 1959 to present, Alaska State Library, Historical Collections.

Bush pilot and salmon setnetter Jay Hammond later became the State of Alaska's fourth Governor.

Shaping Alaska's History

Good Friday

Steve Pennoyer was in the kitchen of his Anchorage home on Good Friday in 1964 when the shaking began. It was shortly after 5:30 p.m.; his wife was preparing dinner and

his three children were playing down in the basement.

"I was sitting at the kitchen counter, my wife was cooking dinner, and it started to rumble," Pennoyer

recalled. "Well, this was a common occurrence in Anchorage but what made this one different wasn't the violence as much as the duration. Other quakes would last seconds; this one went on for five minutes." An aquarium in his living room toppled over. The refrigerator was shaken open and its contents spilled out across the kitchen floor.

"I ran down the basement steps, grabbed all three kids and carried them up. The wooden steps were shaking back and forth. It was huge. We were sitting in the dining room, the three kids, my wife and me. I tried to save my favorite fish in a jar but don't think they made it. Every time it shook we'd go under the table. After one big aftershock we went out and sat in the car. There was no telephone, no heat, the water was out; the only radio was local and there were reports of fires and looting. That night we were just plain scared."

Steve Pennoyer's family was lucky. They had just survived one of



Above: A 200 ton diesel switch engine of the Alaska Railroad lies on its side more than 200 feet from its original position in Seward, Alaska, following the Alaska Earthquake and tidal wave 3/27/64.

Alaska National Guard Photograph, from the Alaska Earthquake Archives Committee Collection, Alaska and Polar Regions Collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks.

Right: Large scale damage was inflicted on the Alaska port city of Seward by the Good Friday earthquake and the tidal wave that followed shortly thereafter. As the high water receded, only twisted wreckage of the once bustling port remained 3/27/64.

Air Force Photo, Alaska Earthquake Archives Committee Records, Alaska and Polar Regions Collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks.



Shaping Alaska's History



Kodiak, Alaska, following the Alaska Earthquake and Tidal Wave 3/28/64.

Photo courtesy of the Alaska Earthquake Archives Committee Collection, Alaska and Polar Regions Collections, Elmer E. Rasmuson Library, University of Alaska Fairbanks.

the largest earthquakes in recorded history. Other Alaskans did not. Nine Anchorage residents were killed when blocks of homes and businesses collapsed downtown and the Turnagain Heights subdivision slid into the Inlet. Tsunamis took 106 lives when they swept into Kodiak, Seward, Valdez and other coastal communities. The waves claimed another 16 lives when they hit the Oregon and California coast.

Pennoyer was among a group of young fishery biologists brought to

Alaska at the beginning of statehood and would go on to a long and distinguished career with the Department of Fish and Game and the National Marine Fisheries Service. In the weeks immediately after the quake, Pennoyer witnessed the destruction in fishing communities like Kodiak, where salmon seiners were heaved into the center of town and cannery docks were splintered by the waves.

Uplift and subsidence caused by the quake affected fish habitat in Cook Inlet and Prince William

Sound, leaving some areas high and dry while others were flooded by salt water. Biologists worried about the impact of such changes to the habitat but Wally Noerenberg, the Department's director of biological research, later concluded that the overall impact would be minimal.

The earthquake of March 27, 1964 shook the young state to its core and caused millions of dollars in damage to the fishing industry. No one who experienced the seismic wrath of that day would ever forget Good Friday.

Shaping Alaska's History

Offshore Threats

As Alaskans wrested control of their fisheries from the federal government, a new threat emerged offshore. The International North Pacific Fisheries Commission fisheries already allowed the Japanese to fish for salmon in the western Aleutians but in the 1960s, the Japanese cast their nets wider in both the Bering Sea and Gulf of Alaska, targeting halibut, herring, and crab. And they were not alone.

Russian trawlers soon appeared off the Alaska coast also looking for herring, crab, and flatfish. The Soviet ships appeared by the dozens at first; soon their numbers topped 200 vessels and they operated within sight of shore, just over the three-mile limit.

"Oh, are you kiddin'? You could go to downtown Kodiak at night and look out off Cape Chiniak; it'd look like a city out there with all the factory ships," said crab biologist Guy Powell. The three-mile boundary of territorial waters had been defined centuries earlier by the limit that a cannon shot could then defend from shore. By the 1960s, both cannons and fishing fleets had vastly increased their range but the three-mile limit remained unchanged.

With the Cuban missile crisis underway, headlines in the Anchorage Times bristled with Cold War rhetoric: RED FISHING SAID THREAT; SPOT RUSS NEAR KAMISHAK BAY; SOVIETS CLIP KODIAK CRAB TAKE. A state senator from Cordova warned, "If we don't take advantage of the bottom fish resource off the Alaska coast, we will lose it to Japan and Russia by default."

When the federal government refused to take action, Alaskans did.

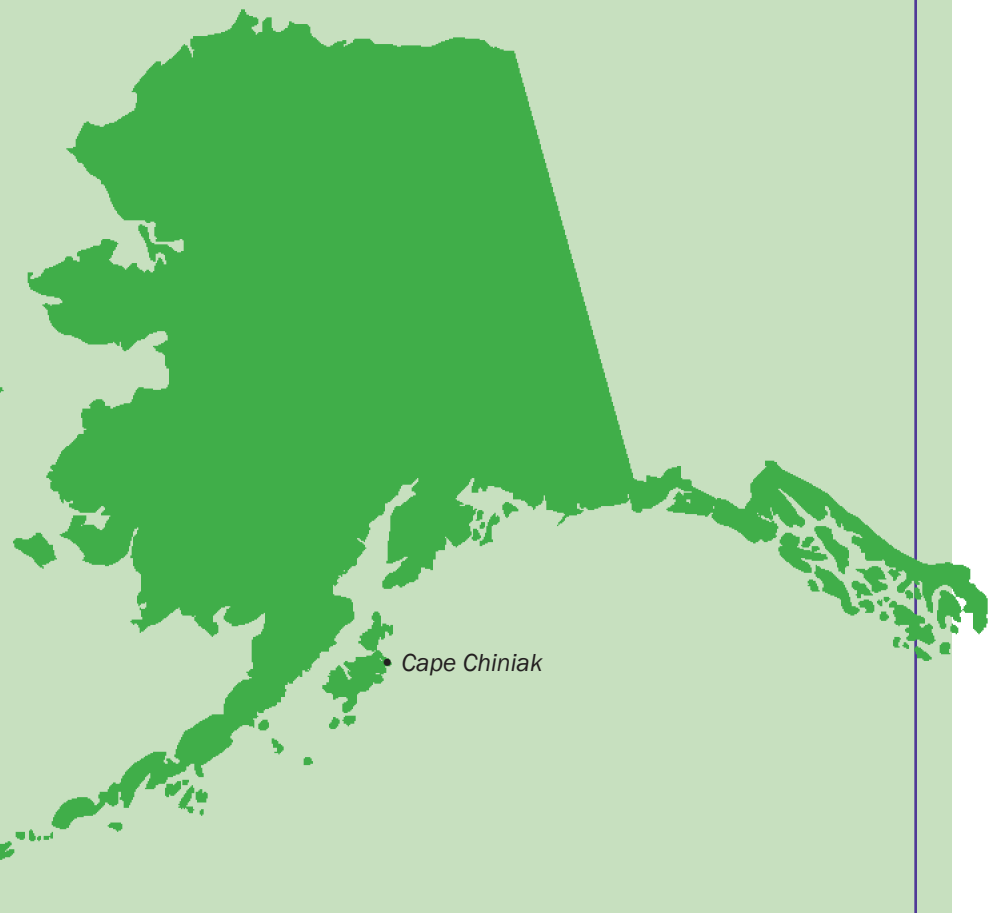
In 1962, Governor Bill Egan ordered state troopers to seize three Japanese trawlers in Shelikof Strait and charged their skippers with fishing in state waters. "Only through the rigorous enforcement of these regulations can we protect the rights of all fishermen dependent upon these waters for a livelihood and conserve the valuable sea products for future generations," Egan said.

Senator E. L. "Bob" Bartlett, credited as one of the architects of statehood, pushed through legislation in 1964 that banned foreign fishing in territorial waters and claimed authority over bottom dwelling species like crab that lived on the continental shelf. Egan immediately flew to Moscow to negotiate an agreement

to keep the Soviet fleet away from Alaska crabbers. Salmon was still king, however, and Egan was particularly angered by the Japanese high seas fishery that targeted Bris-

"You could go to downtown Kodiak at night and look out off Cape Chiniak; it'd look like a city out there with all the factory ships."

—Guy Powell, crab biologist



Shaping Alaska's History



U.S. Coast Guard Cutter Storis escorting the Russian side trawler STRM 8-457 to Kodiak in 1967. Reflecting the Cold War tensions of the era, the press reported the Russian trawler arrived in port “by the dawn’s early light.” The Soviets claimed the vessel was fishing in the Indian Ocean.

Photo courtesy of the U.S. Coast Guard.

tol Bay sockeye. With the Cold War underway, the State Department refused to take a hard line in the International North Pacific Fisheries Commission. As Secretary of State Avril Harriman put it, “good relations between Japan and the United States were more important than salmon.”

Not to Egan. His frustration over Japanese high seas salmon catches spilled over in 1965 when he threatened to dam Bristol Bay’s rivers and turn its valuable runs of sockeye salmon into landlocked Kokanee. Biologists were aghast, calling the idea “madness and foolhardy” but as the Anchorage Times noted, “the governor obviously has succeeded in

his first objective—that of focusing attention on a critical problem.”

Egan’s brinksmanship did get noticed and in 1966 the United States joined other nations in extending its territorial waters from three miles to twelve. But the Japanese refused to recognize the 12-mile limit and the Soviets just ignored it. In the years that followed, foreign encroachments into state waters occurred with increasing frequency. Soviet trawlers were boarded near Sand Point and Chignik; one vessel was caught twice fishing within the 12-mile limit. Warning shots had to be fired to stop Japanese gillnetters fishing for herring in Norton Sound.

Vessel seizures became Cold War media spectacles. When the Soviet trawler STRM 8-457 was boarded in the Shumagin Islands in 1967, the press reported it was escorted into Kodiak “by the dawn’s early light.” The Soviet skipper, described as “ruggedly handsome,” was dragged into court where he pleaded, “I have no money. I will need help from my comrades.”

The Russian was later fined \$8,000. Alaskans felt that was a mere pittance. Senator Bob Bartlett called the fine “an outrage; a weak policy of appeasement.” The 12-mile limit wasn’t working. Already, some Alaskans were pushing to extend the state’s jurisdiction even further.



Taking Action

If the 1960s was a decade of Alaska taking control of its fisheries, the 1970s were about taking action to secure its fisheries' future. The state created the Fisheries Rehabilitation, Enhancement, and Development program, better known as FRED, to develop a system of salmon hatcheries; imposed limited entry to stabilize the growing commercial fishing fleet; and pushed the federal government to claim a 200-mile limit to keep the foreign fleets off Alaska fish. Before any of these took hold, things only got worse.

Alaska salmon production in 1973 plunged to just 22 million fish, a new low for the century and the runs that followed the next two years weren't much better. In Bristol Bay the harvest of sockeye salmon dropped below one million fish, its worst catch in recorded history.

This time, however, state biologists saw it coming. The poor returns were the result of two unusually cold winters, and they followed Andy Anderson's direction to rebuild the runs regardless of the pain. Fishing was completely closed in Prince William Sound and restricted to just a few days elsewhere to ensure that adequate escapement reached the spawning grounds. It hit fishermen in the pocketbook even as their numbers were being pared by limited entry.

"My first year in Bristol Bay was right after they instituted the permit system," biologist John Burke recalled. "They shut the fishery down that year. The return was so small there was maybe just one or two days of fishing. Guys came into the Fish and Game office with their permits and wondered, 'What is this worth? It isn't worth anything if I can't fish.' That's how bad it was."

While salmon crashed, Alaska shellfish again started to boom. The shrimp fishery, long a staple near Petersburg, took root near Kodiak and Chignik shortly after statehood with a catch that soon topped 10 million pounds. In the 1970s, the shrimp harvest soared, peaking in 1976 at almost 130 million pounds, a volume similar to that of the depressed salmon runs earlier in the decade.

The king crab fishery also started to rebuild. After the Kodiak peak in the 1960s faded, fishermen turned their attention to the Bering Sea where catches slowly increased. By the early 1970s the catch of king crab from the Bering

Sea totaled 100 million pounds and turned Unalaska-Dutch Harbor into a boom town.

Dutch Harbor struggled with the volume of crab. The city water system dated back to the WW II era. There were problems getting enough containers to ship out the frozen crab. Meanwhile, the crab just kept coming in with a dozen or so boats tied up off every cannery waiting to offload.

The second king crab boom was hastened by passage of the Magnuson Act in 1976 that created the 200-mile limit. The culmination of years of work and international negotiation, the Act created an exclusive economic zone that ended the directed foreign fishing for crab and groundfish off Alaska's coast.

Growing attention to international fishing issues and concerns about the depressed salmon stocks resulted in some other long overdue changes. In 1977, the Japanese International North Pacific Fisheries Commission fleet was finally pushed out of the central Aleutians, reducing its high seas take of Alaska bound salmon. Also in that year, but less immediately apparent, was a shift in climate cycles that would play a dramatic role in what was soon to come. By the late 1970s, Alaska salmon production had jumped to 88 million fish, four times that earlier in the decade. The tide was turning for Alaska salmon.

In the 1970s, salmon production plunged, setting a new low for the century while the harvest of shrimp and king crab soared to record levels.

Left: King crab.
Photo Jim Craig, ADF&G.

Shaping Alaska's History

Limited Entry

Paradoxically, even as salmon runs bottomed out in the 1950s and 1960s, the number of fishermen was on the rise. Alaska's population grew quickly after World War II and the seasonal work of fishing and potential for a big payday attracted not just traditional fishermen, but teachers, the military—everybody. Commercial fishing attracted more and more Alaska Natives to supplement their subsistence harvests. The trend accelerated after statehood when the elimination of fish traps required more fishermen. In the 1960s, the number of salmon licenses in Alaska jumped from 5,000 to 9,000 and more than doubled in lucrative Bristol Bay.

"Alaska's salmon resources cannot produce a livelihood for an unlimited number of fishermen, nor can they be successfully managed for maximum sustained yield," Governor Bill Egan soon concluded. "The only alternative is the stabilization of entry into the fishery at reasonable levels."

But how to do it? Many Alaskans favored restricting non-residents but while popular, the idea quickly ran afoul of the federal constitution. Other proposals ran squarely into the state Constitution's guarantee of fish as common property. At Egan's urging, Alaska lawmakers proposed a constitutional amendment in the early 1970s that would allow limited entry for the purposes of resource conservation and preventing economic distress among fishermen.

It was highly controversial. While some saw merit in limited entry, others were deeply opposed. As a legislator from Halibut Cove, Clem Tillion felt the consequences for his support of limited entry. "Even my niece got her tires slashed," Tillion recalled. "My kids were beat up on the playground. It wasn't nice."

But the amendment passed and a bill was drafted with remarkable speed that set an optimum number of permits for each fishery, assigned permits based on an individual's fishing history, and allowed for permit transferability, an important provision for Alaskans who wanted to pass along the fishing privilege to their children.

Alaskans were still divided on the idea. A Naknek fisherman challenged the law in court, arguing that Limited Entry "creates an aristocracy of fishing families who have exclusive privileges in the publicly owned resource." The fight went all the way to the Alaska Supreme Court which found legitimacy in the arguments for limiting entry. The court, however, also recognized the tension between limited entry and the guarantee of a common property resource. To be constitutional, they concluded, limited entry should "impinge as little as possible" on

open access. That opened the door to dozens of other lawsuits from those denied permits for a variety of reasons. Limited Entry became one of the most litigated laws in Alaska history with over 70 Supreme Court decisions to date.

Limited Entry did protect Alaska from an influx of fishermen when depressed stocks reduced other west coast fisheries and court decisions cut deeply into their fishing fleets.

Permit transferability proved to be one of those mixed blessings. In some regions, local participation in the fishery declined as permits were sold out-of-region or out-of-state. And when permit price tags ran into the hundreds of thousands of dollars, the cost of entering the fishery skyrocketed. One young Petersburg fisherman found that the needed permits, a boat, and gear cost him twice what it would have to get a medical degree from Harvard.



Governor Bill Egan (center, seated) signs Alaska's Limited Entry bill into law in 1973. Standing (L to R) are Phil Daniels and members of the Governor's Limited Entry Study Group: Roy Rickey, David Jackman, Rich Listowski and Alan Adasiak. Photo courtesy Rich Listowski.

Shaping Alaska's History

Magnuson-Stevens

Barely a year after he was appointed to the U.S. Senate, Ted Stevens saw the problem for himself. "In January of 1970, I went to Kodiak and asked the Navy to fly me to the Pribilofs," Stevens recalled. "There was an amphibious plane there, an Albatross, and we flew from Kodiak to the Pribilofs at fairly low level. I counted more than 90 foreign fishing vessels anchored there just off our state. And they had a bunch of little catcher boats going out from them. It really bothered me a great deal."

Not long afterward, Stevens introduced legislation to extend America's jurisdiction from 12 to 200 miles offshore. Three South American nations already claimed such a limit and seized American tuna boat within it, prompting U.S. objections. Stevens' bill went nowhere. Tuna fishermen didn't like it and Stevens was just a freshman senator, newly-appointed to the job and in the minority party. He found a supporter, however, in a senior senator on the other side of the aisle. Washington Senator Warren Magnuson shared Stevens' concern for fish.

In the years that followed, Magnuson and Stevens crafted a series of bills that called for a 200-mile limit. The idea still faced high-level opposition. The State Department worried that unilateral action by the U.S. would anger the Soviets and derail the already long-delayed international Law of the Sea negotiations. The Navy feared such a limit would hinder navigation and commerce, close strategic straits, and threaten national security. Even the Air Force testified against the bill, worried that the 200-mile limit might apply to airspace.

Stevens countered that similar fears were raised about the 12-mile limit and proved unfounded.



Sen. Ted Stevens, R-Alaska, and the late Sen. Warren Magnuson, D-WA, of the Magnuson-Stevens Fishery Conservation and Management Act, which is the primary law governing marine fisheries management in United States federal waters.

Photo courtesy of Anchorage Daily News archive.

The 200-mile limit, he argued, was about conservation. "The concept is 'Shall the living resources of the sea have a chance to survive?'" Stevens told the Senate. "The major fishery within our shores is, in fact, the Alaska pollock, where the (foreign fleets) have taken 2.3 billion pounds in one year. That pollock is the basic food chain for the Bering Sea and North Pacific and if this continues even another 2 or 3 years, it will go the way of the California herring. It will disappear from the ocean. We cannot stand that kind of pressure."

The arguments of Stevens and Magnuson eventually won the day. "Foreign overfishing off our coasts cannot be allowed to continue," President Gerald Ford said in 1976 as he signed into law the Fishery Conservation and Management Act. In time, it would simply be known as the Magnuson-Stevens Act. The law did not hinder navigation or security; it created an exclusive economic zone to regulate fishing, oil and gas, and mineral development. Other nations soon joined the U.S. in claiming a 200-mile limit.

The extended jurisdiction was just the start. The Magnuson-Stevens Act also created a series of regional fishery management councils to regulate fishing within the

newly claimed waters. With its huge fisheries, Alaska was the only state that was a region unto itself. The 11 voting members on the North Pacific Fishery Management Council included the commissioner of the Department of Fish and Game and five others appointed by the Governor, giving Alaska a majority.

"We were fortunate. We started out with a first class council and a first class chairman," remembered Jim Branson, the first director of the Council. "Elmer Rasmuson was a brilliant man. He was really interested in the subject and dedicated. He had background in international fisheries. He'd been with the International North Pacific Fisheries Commission and worked with those folks a lot. And then we had Clem Tillion. He was and is very, very good at this business. Nobody ever agrees with Clem 100 percent but he's right most of the time, I've got to admit."

The new council adopted Andy Anderson's idea for separating the scientific decisions from matters of allocation and established both a Scientific and Statistical Committee to advise the council. Then they went to work building from scratch a fishery that measured in the billions of pounds.

Shaping Alaska's History

FRED

Early in the 20th century, Alaska salmon packers were required to rear enough salmon fry to make up for their catch, but the law was either ignored or used for ulterior motives. One year, a packer canned over \$3 million worth of salmon, mostly in Bristol Bay, but thanks to credits for hatchery releases near Karluk and Ketchikan, owed just 32 cents in taxes, a bill they paid with stamps.

In 1971, with salmon runs mired in a cycle of low and erratic productivity, the Alaska Legislature took a new look at the hatchery idea but with a scientific bent. The Fisheries Rehabilitation, Enhancement and Development program, better known as FRED, was created to "do all things necessary to ensure perpetual and increasing production" of Alaska salmon by developing a system of hatcheries across the state.

"The FRED Division was designed to rehabilitate and enhance depressed stocks and help reduce the economic impact in years of low natural stocks," said the division's chief, Stan Moberly. It meant assembling a team of biologists with expertise in things like genetics and fish pathology, as well as engineers and project managers.

Though raised in hatcheries, the enhanced production retained its roots in the

Alaska wild. State policy prevented brood stock from coming out of state or even from different regions within the state and geneticists made sure the policy was followed to the letter.

The first new hatcheries were built at Crooked Creek and Gulkana in 1973 and new hatcheries came on line at a rate of about two a year.



Our New Logo!

ALASKANS APPROVE HATCHERIES BOND ISSUE

Alaskan voters gave their hatchery program a boost in November by approving a \$26.9 million fisheries development bond request. This means that Fisheries Rehabilitation, Enhancement, and Development (F.R.E.D.) Division can proceed with plans to build four salmon and trout hatcheries throughout the state.

The new hatcheries—at Snettisham near Juneau, Main Bay in Prince William Sound, Ship Creek near Anchorage and at Kotzebue Sound—will have a total capacity of 155 million eggs. F.R.E.D. Director, Robert Roys, said the hatcheries are required to produce catchable fish for Alaska's burgeoning sport fishing population, and to moderate the "boom and bust" cycles in the commercial salmon industry.

The planned expansion of the Ship Creek complex, located on the military base at Fort Richardson, is intended as a boon to sport fishermen. Along with the annual production of 7 million king and coho salmon smolts, the expansion will increase rainbow trout production from 500,000 fingerlings to 2.5 million. Department planners estimate that the trout production alone will create an additional 600,000 recreational days of angling yearly.

The Snettisham hatchery is the largest of those proposed, with a capacity of 71.5 million chum salmon eggs and 5.4 million king and coho salmon eggs. While most hatcheries are constructed along rivers and streams, the Snettisham facility will be built adjacent to a hydroelectric plant operated by the Alaska Power Administration (A.P.A.). The power plant receives its water through a two mile tunnel from Long Lake. The hatchery will be permitted to use water in this plant's tailrace, water determined to

be suitable for fish culture. With F.R.E.D. Division and A.P.A. sharing facilities at Snettisham, each agency will be able to operate at a lower cost.

The Main Bay hatchery will have an initial capacity of 65 million chum and pink salmon eggs. Pink salmon will be phased out of production once a sufficient broodstock of the more valuable chum salmon is developed. These fish are intended for the gillnet and seine fisheries of Prince William Sound. The hatchery site is remote, but there is plenty of good water and room for future expansion.

The Kotzebue hatchery was added to the bond request by the Legislature, and consequently, planning for this facility is at an early stage. It is a demonstration project to determine the potential of fish culture in the arctic regions. The hatchery will be designed with an option to double its planned capacity of 30 million chum salmon eggs.

The four hatcheries should produce \$20 million worth of salmon annually when they achieve full production.



ADF&G Newsletter.

Shaping Alaska's History

By the late 1970s, they had the capacity to incubate over 100 million eggs. Over the years, the FRED division built over 20 hatcheries and then, embracing the statehood concept of local control, turned them over to the fishermen.

"The plan from the very beginning was that the state was going to develop the hatcheries and then it was going to be a user-pay thing where the fishermen themselves funded the hatcheries," said John Burke, a former FRED Division biologist, and now general manager for the Southern Southeast Regional Aquaculture Association. "The state would invest in research and developing the technology and once that was stable, turn it over to the fishermen so they paid to enhance their industry."

A second law passed in 1974 created Private Non-Profit or PNP corporations and regional aquaculture associations controlled by the fishermen to run the hatcheries. Over the years, as many as 36 PNP hatcheries operated with impressive results: the capacity to incubate 1.5 billion eggs and annual returns of 50 to 80 million adult salmon.

Having largely fulfilled its role, the FRED program was merged into the Fish and Game's Division of Commercial Fisheries in the early 1990s. Some lamented the loss of the division with a friendly and familiar name but it had fulfilled its role, raised the science of aquaculture to a new level, and then turned it over to those who depended on it. The overall impact of the FRED division was huge.

"There were two years, 2000 and 2006, where probably half the value of the salmon fishery was hatchery-driven."

—John Burke

"It's been enormous, particularly in Southeast, Prince William Sound, and to some extent Kodiak," John Burke said. "There were two years, 2000 and 2006, where probably half the value of the salmon fishery was hatchery-driven. The wild production wasn't there and there were really good hatchery returns and decent markets. It enabled some fishermen to go forward where if they had relied just on natural production, it wouldn't have happened."



Harvesting roe.
Photos ADF&G.

Alaska territorial fish hatchery. Interior view, with water filled tanks on stands.
Winter & Pond photo. Courtesy of the Alaska State Library Photograph Collection.



Triumph and Tragedy

The sacrifice made by salmon fishermen during the first two decades of statehood, as the Department of Fish and Game stuck to its policy of putting escapements first, was rewarded in 1980 when salmon returned to Alaska rivers in numbers not seen in 40 years. In the decade to come, salmon production pushed to heights never imagined.

In 1980, a record return of over 62 million sockeye salmon surged into Bristol Bay. Pink salmon returned to the waters off Kodiak and the Alaska Peninsula in levels not seen since the 1930s. Runs were strong in Southeast, Prince William Sound, and Cook Inlet. Even the Kuskokwim River saw its commercial harvest of chums and cohos top one million for the first time ever.

The statewide catch of 110 million salmon in 1980 ranked just below the record catches in the mid-1930s and would have been higher had not a lengthy price dispute limited the catch in Bristol Bay. History was made in 1983 when Bristol Bay fishermen landed a record 38 million sockeye salmon, a full 50 percent more than the previous record catch.

During the decade to come, salmon production in Cook Inlet more than doubled. As the FRED Division's new hatcheries came on line in Prince William Sound, five new catch records were set in seven years, topping out at 33 million salmon. Hatchery production helped boost the Southeast harvest to 30, 40, 50, and finally 66 million salmon.

Alaska's salmon catch set a record of 154 million fish by the end of the decade. The strength in returns was due to multiple factors: Fish and Game's diligence in managing for escapement goals, strong hatchery returns, reduced high-seas interceptions, and a change in climate in 1977, a shift from cold to warm that is now called the Pacific Decadal Oscillation.

"Sockeye salmon are plankton feeders. You ratchet the temperature up a degree or two and the plankton bloom increases with it," said former Bristol Bay biologist Jeff Skrade. "I really think that sockeye benefited from warmer water conditions. Certainly there's a point of diminishing returns but we haven't gotten there yet. That, plus the 200-mile limit and being

Left: Gillnetter.

Photo Steve Lee, courtesy of ASMI.

really hard-nosed about getting escapements got the stocks back up."

A strong market for salmon, mainly in Japan, also boosted prices. When sockeye hit \$2.40 a pound in 1988, Bristol Bay fishermen boasted that every salmon was worth more than a barrel of oil. The combined value of the Alaska's salmon catch to fishermen that year peaked at over \$700 million.

While salmon was ascendant in the 1980s, the boom in shellfish turned to bust. The shrimp fishery off Kodiak Island and the Alaska Peninsula that peaked in the late 1970s began a slow decline until the fishery was finally closed in the early 1980s. Biologists say the same climate shift that favored salmon and other species had an opposite effect on the shrimp. Cod were also more abundant, but they fed on the shrimp and contributed to the latter's decline.

The fallout for king crab was even more severe. In the Bering Sea, the fishery peaked in 1980 with a record catch of 130 million pounds of red king crab, but the harvest was cut to just 33 million pounds the following year, 3 million pounds the next, and in 1983 the fishery was closed. Some blamed overfishing but other factors were involved.

"The crab population was going to crash and there was no controlling it," remembered Ken Griffin, then manager of the Bering Sea crab fisheries. "They later diagnosed a disease in them, a reproductive disease, and the cod population was decimating the larvae and the younger crab. Had we foreseen the crash, we might have been able to spread the harvest over a longer period of time and maybe lessened

While salmon was ascendant in the 1980s, the boom in shellfish turned to bust.

the impact on industry but it was going to happen.”

The collapse was widespread. Crab disappeared from around the Aleutian and Pribilof Islands, the Alaska Peninsula, and Kodiak. While the Bristol Bay fishery later recovered at much more modest levels, other king crab fisheries including Kodiak, have not reopened to this day.

The financial impact for the fleet was severe. As million-dollar vessels were repossessed, a joke made the rounds in Seattle that if you opened a new bank account in Ballard, you were offered the choice of either a toaster or a crab boat. To many it wasn't funny. Those who survived moved into other fisheries, targeting other species of crab or the new fisheries that were evolving after passage of the Magnuson-Stevens Act.

While the Bristol Bay fishery later recovered at much more modest levels, other king crab fisheries including Kodiak have not reopened to this day.

With the 200-mile limit in place, the North Pacific Fishery Management Council soon started to take control of the fisheries in the Gulf of Alaska and Bering Sea. The American fishing industry wasn't ready to take over immediately, so initially foreign fleets were allowed to continue fishing, under license, and for a fee. Some proposed forming partnerships with the foreigners, but it wasn't a popular idea.



King crab fishery.
Photo courtesy of ASMI.

“Joint ventures had been talked about early on but the Council was dead set against it initially,” said Jim Branson the first director of the North Pacific Fishery Management Council. “People weren’t interested in doing anything with the foreigners that looked like it might help them. They had the idea that a joint venture might be too good for them and not good enough for us. Turned out it didn’t work that way.”

Eventually, the Council realized that joint ventures were a step toward Americanization of the fishery. It produced some surprises. One foggy spring morning in the mid-1980s, Togiak herring fishermen were shocked to wake and find themselves surrounded by huge factory ships flying the hammer and sickle, a joint venture between American fishermen and Soviets for yellowfin sole.

Joint ventures peaked in 1987 when almost 75% of the Alaska groundfish catch was landed by American fishermen and delivered to foreign partners. It was also just a transition. The domestic industry was fast investing in the factory trawlers and shore plants needed to handle the annual catch of 4 billion pounds of groundfish. But Americanization of the North Pacific wasn’t exactly going according to plan.

After being kicked out of Alaska’s Exclusive Economic Zone, many Japanese, Korean, and Taiwanese fishing vessels turned their attention to driftnetting in the North Pacific. Using monofilament gillnets intended to catch squid and other species, they also caught salmon, tuna, seabirds, and marine mammals. Critics called the driftnets “curtains of death.” At the peak of the fishery, over 700 squid boats fished the North Pacific, joined by hundreds of other driftnet vessels that set out tens of thousands of miles of driftnets every night. Many openly fished north of their fishing zone where they targeted not squid, but Alaska salmon.

Many foreign trawlers also moved into international waters. In 1988, two fishermen chartered an airplane out of Dutch Harbor and flew to the middle of the Bering Sea, an area of international waters beyond the 200-mile limits of both the United States and Soviet Union known as the “Donut Hole.” As their plane descended beneath the clouds, Ted Evans and Sam Hjelle found a fleet of foreign trawlers actively at work, some fishing well within the U.S. boundary. “We caught them red-handed,” Evans later told the press. The 200-mile limit may have

pushed the foreign fleet over the horizon but they were still a threat, catching over 2 billion pounds of Bering Sea pollock a year.

Meanwhile, the rapidly growing domestic fleet that entered the fishery wasn’t necessarily what the framers of Americanization had envisioned either. “The rise and fall of the JV fleet created an opportunity for entrepreneurs who came through the Gulf of Alaska in 1989 and took the entire quota in one fell swoop,” recalled Dave Benton, then Fish and Game’s director of international fisheries. “They did it by roe stripping. They were taking the pollock, stripping out the roe, and throwing the rest overboard in huge quantities. They shut down Kodiak then moved into the Bering Sea and took all the quota there. That’s how they could move through it so fast. It was very lucrative and very wasteful.” And it was not destined to last.

In the history of Alaska’s commercial fisheries, the 1980s was a decade like none other. Salmon returned in record numbers, a new, lucrative fishery emerged for sac roe herring and joint venture fishermen were Americanizing species once scorned as trash fish. New challenges emerged in the Donut Hole and from roe stripping and driftnets. Fishermen and entire fishing communities still struggled with the collapse of king crab and shrimp, but the survivors had already turned their attention to other species like tanner and snow crab or the new opportunities offered by the Magnuson-Stevens Act.

None were prepared for the tragic climax to the decade. It came early in the morning on another Good Friday, March 24, 1989, when the Valdez marine radio crackled with word that a tanker had fetched up hard aground on Prince William Sound’s Bligh Reef and evidently was leaking some oil.



Oil-covered Harbor seals by Little Smith Island.
Photo ADF&G.

Shaping Alaska's History

Exxon Valdez



The Exxon Valdez oil spill eventually covered 11,000 square miles.
Map ADF&G.

Alaska fishermen have long had an uneasy relationship with oil. As Fish and Game struggled to rebuild salmon runs after statehood, oil took over the dominant position in Alaska's economy. But after some notable gas well blowouts in Cook Inlet, fishermen became worried about possible impacts to their fisheries. With the discovery of the giant Prudhoe Bay field in the late 1960s and completion of the pipeline terminal in Valdez almost a decade later, that concern was shared in Prince William Sound.

Fishermen's worst fears came true on another Good Friday, 25 years after the devastating 1964 earthquake. Early in the morning of March 24, 1989, the tanker *Exxon Valdez*, under the command of a lapsed alcoholic and with a junior officer at the helm, veered from the tanker shipping lanes to avoid ice and grounded on a charted reef in Prince William Sound, spilling 11 million gallons of crude oil.

"I was laying in bed in Anchorage when I got a phone call from the staff

in Cordova," recalled biologist Chuck Meacham, Junior, then research supervisor for the central region that included Prince William Sound. "They filled me in and I was on the first available flight to Cordova." Like many other Alaskans who responded to the spill, *Exxon Valdez* would soon take over his life. Meacham was assigned the job of fisheries research leader for the oil spill response.

"One of the first decisions was whether to divert our vessel which was doing the spring fry and egg digs around Prince William Sound," Meacham said. "People were interested in pulling it off for oil spill-related response and who knows what. At the time it seemed incredibly important to me to document what went on with that oil relative to our salmon streams and intertidal spawning areas. There was a bit of a battle to keep the vessel on task, paying attention to fisheries biology, but I still feel it was the right thing to have done."



Above:
Dead,
oil-covered
seabird.
Left: ADF&G
employee
lifts a dead,
oil-covered
otter.
Photos ADF&G.

Meacham also decided to base his headquarters in Cordova to stay away from the madness occurring in Valdez where the spill response was centered and international media converged. He was not far from the impact of the spill.

"It was amazing, the stench in the air; the oil everywhere. The thing that most surprised me was how once you got into oil you couldn't get rid of it. We would take a skiff into a small salmon stream, throw the anchor overboard, do our survey, come back and there's a little bit of oil on anchor line. Pulling it up, you'd let a little oil get on you and then it gets on the boat and your raingear and

Shaping Alaska's History

your boots and everything else you touch. Once you touch this stuff or it touches you, there was no escaping it."

There was also no escaping the spill's impacts to the commercial fishing industry. The herring fishery in Prince William Sound was the first to be closed, soon followed by shrimp, crab, and finally salmon, both wild and hatchery production. More closures followed as the oil spread to Cook Inlet, Kodiak, and as far as Chignik. Fish and Game adopted a "zero tolerance" policy to fishing in oiled areas to prevent any contaminated seafood from entering the market. The financial loss to fishermen, processors, hatcheries, and fishing communities was huge.

Meacham witnessed the impacts to the people and industry as he documented the spill's biological

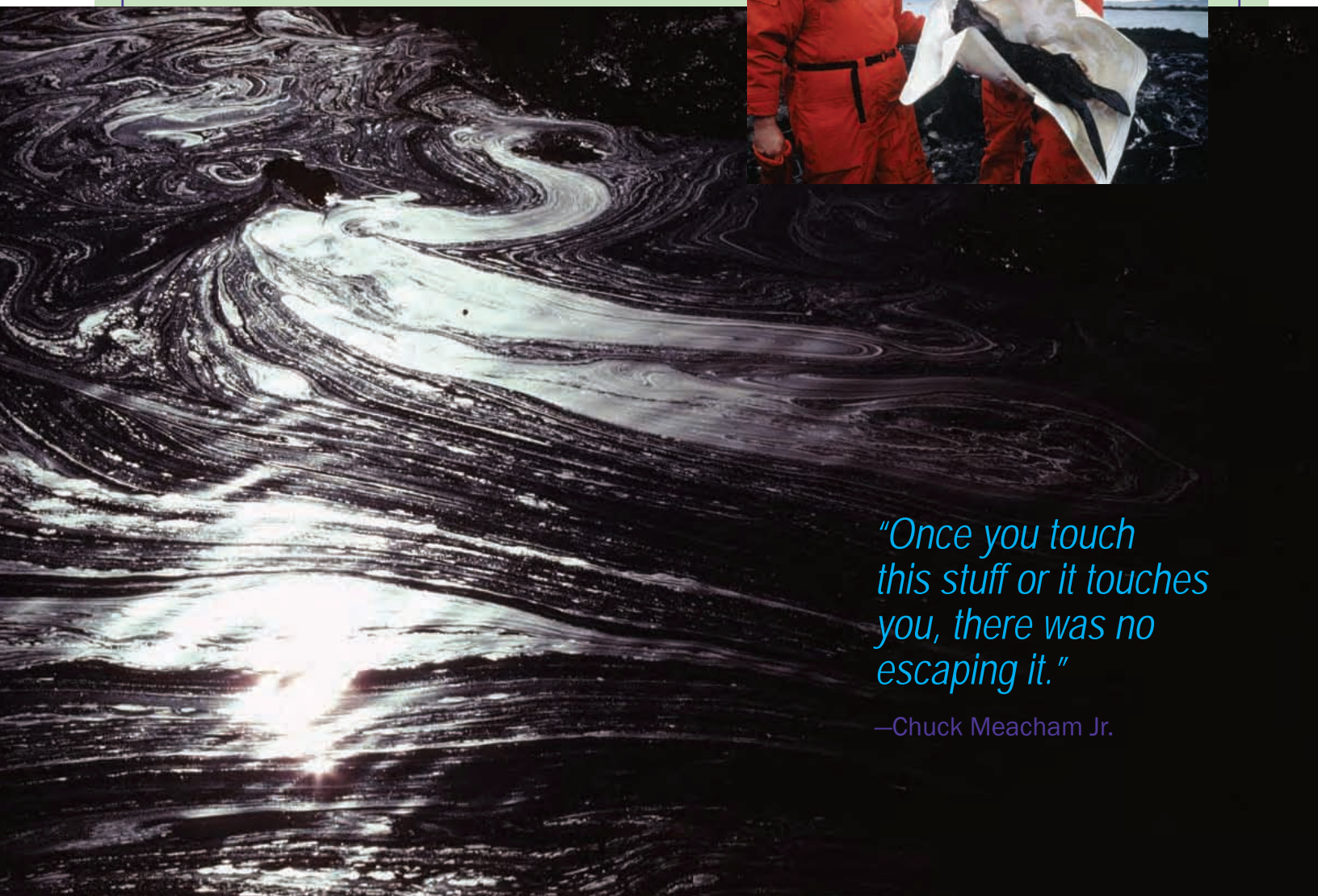
impacts and years later, the Sound's recovery.

"Clearly the greatest damage was to people: fishermen and subsistence users. There's a lot of trauma that will take generations to get through," Meacham said. "There's no question the spill had a devastating impact on birds and marine mammals. On the fish side, it was less clear, primarily because you don't find dead fish as easily as other oiled animals. There were lots of subtle and not so subtle impacts on finfish and shellfish but I would say by-and-large Mother Nature is amazing in its ability to recover from these kinds of body blows. Slowly

but surely over the next number of years the fish came back. With the possible exception of herring."

While salmon and other species rebounded from the spill faster even than the courts could deal with its aftermath, the herring never recovered. Some strong catches followed in the years immediately after the spill but the return of herring from 1989 was one of the poorest on record and subsequent year classes were also poor. As the biomass steadily declined in the wake of the *Exxon Valdez*, the Prince William Sound herring fishery was finally closed. It has remained closed ever since.

Right: Examining an oil-covered otter. Below: Exxon Valdez crude oil.
Photos ADF&G.



"Once you touch this stuff or it touches you, there was no escaping it."

—Chuck Meacham Jr.

Shaping Alaska's History

Sac Roe Herring

A big change created by the Magnuson-Stevens Act involved a little fish. Alaskans had long fished for herring, an abundant but low-value species occasionally used for food and bait, but most often rendered down for its oil. This reduction fishery, as it was called, grew in the late 1930s to over 110,000 tons annually, but waned after World War II when cheaper species like sardines and anchovies dominated the fish oil market. There was still demand abroad, however, and as foreign fleets moved into the Bering Sea and Gulf of Alaska, the herring harvest off Alaska peaked at almost 170,000 tons in 1970. This booming foreign fishery was soon closed by the 200-mile limit.

"We didn't realize there was that large a biomass out there and it had gone almost unexploited," recalled Jeff Skrade, manager of Bristol Bay's Togiak herring fishery. "There was a lot of foreign high-seas effort. They were 12 miles out; you could see them off of the Nushagak and

Togiak. Magnuson-Stevens, though, created a void on the market and the response by the American industry was immediate."

Not only was there a void to be filled, a new and lucrative market had emerged. Herring eggs, called sac roe, were a delicacy in Japan, a New Year's Day treat that they were willing to pay big money for—over \$1,000 a ton for high quality herring. From Kah Shakes near Ketchikan to Prince William Sound, Cook Inlet, Kodiak, Togiak, and as far north as Norton Sound, fishermen and processors rushed into the herring fishery in the late 1970s. In 1980, the sac roe herring harvest almost doubled to over 40,000 tons.

With a large resource and strong market, sac roe herring had a gold rush atmosphere. The fishery was fast-paced and furious, caught in gillnets and purse seines, as spotter planes circled overhead to guide the nets. Fishermen's imaginations were set afire by the prospect of a million-dollar set, a single seine

that encircled a thousand tons of high value herring.

The rapid interest in herring took Fish and Game by surprise. When the Togiak fishery started, the regulation book stated simply, "There is no closed season on herring." That didn't last long. A surge in effort forced Fish and Game to take steps to control the harvest, but at times, it seemed the industry grew faster than Fish and Game could react.

"One year in the early 80s we went out for a short test fishery, you know, take a little bite," said Skrade. "We knew there was some fish around but didn't know how much so we called a 20-minute opening and they harvested 20,000 tons. I'll never forget it. We were all flabbergasted."

Biologists soon developed methods to estimate the biomass and set catch quotas to ensure the sustainability of the resource. The fishery also prompted a shift in the sometimes adversarial relationship between the Department and industry. Biologists still set the catch quotas, but since the market depended on the maturity of the roe, they worked with industry to time openings when the quality and value was at its peak. At Togiak, the meetings became known as beach parties.

"The beach parties were fun," Skrade said. "We would send out boats to a whole bunch of different areas to get samples from known concentrations of fish, bring those to a central location at Nunavachak beach or Summit Island, and then lay them out. Basically, it was trying to share the agony with industry about when the best time to open was. Again, we were on a learning curve and respected the opinions of a lot of the people who were participating."



Record-setting Sitka herring set.
Photo ADF&G.

Shaping Alaska's History



Checking roe maturity: Togiak beach party fare.
Photo courtesy of Bob King.

Across Alaska, sac roe herring catches soared in the 1980s to over 50,000 tons annually and peaked at over 60,000 tons in 1992. In the years that followed, Japan's taste for herring roe slowly faded. Prices fell and effort waned. The herring resource, however, remained healthy and the fishery still grabbed fishermen's imaginations. In 2008, headlines flashed across Alaska when Sitka seiners landed \$5.5 million worth of herring in just 60 minutes.

Computers

Computers are so ever-present today it's hard to remember life before them, but Hal Geiger does. Geiger joined the FRED Division as a biometrician in 1982, just as microcomputers were coming of age. The change they brought, he says, was revolutionary.

"Before microcomputers, we had Hewlett Packard calculators," Geiger recalled. "I had the job of figuring out how many hatchery fish there were. I had two people work with me and we sat there with our calculators for weeks, crunching numbers and double checking each other. On a computer, I could do this by myself in less time than it took three of us with calculators."

But getting the new technology wasn't easy. The state invested in a large mainframe computer and expected all departments to use it. For scientists like Geiger, it was useless. The mainframe was designed for administrative functions like accounting and printing checks. All programming was done in a business language called COBOL.

"They had no idea what scientists wanted to use computers for or what we could do with them but they had an interest in keeping people tied into the

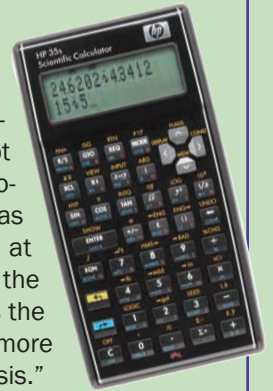
mainframe," Geiger said. "We kept trying to get microcomputers but it was like being on trial at Nuremberg. And the verdict was always the same: you need more cost/benefit analysis."

Some eventually just bought their own computers. Geiger shelled out \$1,600 for a then state-of-the-art Kaypro II with 64K of RAM, two 5¼-inch floppy drives and a 9-inch green phosphor screen. Set in an aluminum case, the Kaypro was billed as "portable." But weighing in at 29 pounds, owners described it as "luggable." Geiger called it "Darth Vader's lunch box."

As the technology rapidly improved, software became more user-friendly, prices and weights both fell, and microcomputers quickly spread in use at Fish and Game and elsewhere. Some longtime biologists never joined the computer revolution and as they retired, it was the passing of a generation. Biologists who stored and processed data in their own minds, not a hard drive, had a feel for fishery management that could never be replicated on a spreadsheet.

The change to computers was revolutionary, Geiger said, and not just in ways you'd expect from a biometrician. "People think of computers as helping you go through data faster but what it really did was allow people to communicate," Geiger said. "It helped people write better. It helped them take data and graph it in different ways; to find mistakes and correct them easily and quickly. It allowed us to communicate what we had learned and that was what really revolutionized fishery biology."

Left: Kaypro 330 computer.
Above: Hewlett-Packard calculator.



ATLANTIC SALMON

Black x-shaped spots
above the lateral line

Slender or
pinched base

No spots
on tail



does not
extend past the
rear of the eye

Black spots on gills
cover distinguish from
all Pacific species

8-12 anal
fin rays

An invasive species in the Pacific Ocean



Atlantic salmon have escaped from fish farming pens in British Columbia and Washington. They pose a threat to wild Pacific salmon populations through competition for food and habitat.

WHAT CAN YOU DO?

If you catch an Atlantic salmon:

1. Note the location
2. Keep the entire carcass, freeze if necessary
3. Call the Atlantic Salmon Watch Program Toll Free

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Rethinking Fisheries

The 1990s brought new challenges both at home and abroad that forced Alaska to radically rethink its fisheries and how they were managed. The pollock fishery was finally Americanized but there were calls to share some the benefits of the fishery closer to home; rising effort in the halibut fishery prompted action to stop the dangerous and wasteful derby, and thawing relations with Russia prompted a complete restructuring of agreements affecting the high seas.

For Alaska salmon, the boom that began the previous decade pushed to new heights. New harvest records were set during five of the first six years of the 1990s that saw the total catch increase from 155 million to almost 218 million salmon. Increasing hatchery returns were part of the success but wild runs were also strong. Bristol Bay set new catch records of 40 million salmon in 1993 and 45 million in 1995.

But while production soared, salmon prices tumbled from their peaks in the late 1980s as strong world demand spawned a dramatic growth in salmon farming. Unlike hatcheries that incubate eggs and release fry back into the wild, farmed salmon are held in pens their entire lives. Fed fish meal often supplemented with additives, farmed salmon were criticized for their bland taste, artificial color, and for spreading disease and sea lice.

From Sitka to Dillingham, bumper stickers read “Real Salmon Don’t Do Drugs,” and “Friends Don’t Let Friends Eat Farmed Salmon.” Because Atlantic salmon are foreign to the Pacific, escapees from British Columbia net pens found in Southeast Alaska were treated as an invasive species.

elsewhere around the globe. Alaska once dominated the world salmon market, but by the early 1990s it faced stiff competition from farmed salmon from abroad and prices collapsed. Bristol Bay sockeye peaked at \$2.40 a pound in 1988, but within five years plunged to just 64 cents a pound. Prices for other species plummeted as well.

Worse yet, salmon returns took an unexpected dip late in the decade. Two years after Bristol Bay set an all-time record catch of 45 million sockeye, the harvest dropped to just 12 million in 1997 and just 10 million the following year. Returns to other western Alaska rivers were also weak. Usually prices rose in the wake of low returns, but with a glut of farmed fish on the market, fish prices remained low. In Southeast and Prince William Sound, hatchery production helped keep overall production up but Bristol Bay was again declared a disaster.

While salmon struggled, the shellfish industry was still dealing with the aftermath of the king crab collapse of 1983. “It was

terrible,” remembered crab manager Ken Griffin. “The processors were sending people home, the boats were starting to struggle, and the next couple of years there were a lot of foreclosures. It’s like any boom and bust, if you’re not planning ahead, you’re broke. Now the guys that planned ahead, they struggled a bit but still

Alaska once dominated the world salmon market but by the early 1990s faced stiff competition from farmed salmon from abroad and prices collapsed.

FRIENDS ***DON'T*** LET FRIENDS
EAT FARMED FISH
SUPPORT ALASKA'S WILD FISHERIES

Bumper sticker courtesy of Nancy Long.

Responding to public opposition, the Legislature in 1990 banned salmon farming in Alaska, but that did nothing to slow its explosive growth in Norway, Chile, Canada, and

Left: *Seiner*.
Photo courtesy of ASMI.

made money and stayed in the fisheries. They changed to other species or went on to other things and some of them are still out there today.”

Many fishermen turned their attention to another species of crab known as *opilio*. Marketed as snow crab, they were smaller than the kings and fetched a smaller price but were very abundant in the Bering Sea. Once passed over for the high-end crab, snow crab found a niche at family-style all-you-can-eat seafood chains and the catch soared. In 1991 and 92, fishermen landed over 300 million pounds of *opilio* and could have harvested even more except for an upper catch limit in the Council’s fishery management plan. In all, 1.6 billion pounds of *opilio* crab were caught during the 1990s.

Ted Stevens’ vision in passing the 200-mile limit was realized in 1990 when the last groundfish joint venture was phased out and the Bering Sea was fully Americanized. With both record amounts of *opilio* crab and pollock being landed, Dutch Harbor became the number one port in the nation in terms of volume of seafood landed, a distinction it still holds today. But trouble lay ahead among the various sectors vying for Alaska pollock.

The North Pacific Council put an end to the roe stripping problem by banning the practice and designating a special season for roe-bearing pollock, but the state was still concerned about the fleet of highly efficient factory trawlers that moved into the fishery. They stepped in to ensure that some of the fish and the processing jobs came ashore. What followed was a contentious battle before the North Pacific Council in 1992 that resulted in specific pollock allocations for the inshore and offshore sectors. Clem Tillion considered it a major victory. “Inshore/offshore was a big one. We actually required fish to be processed onshore; otherwise Alaska would have gotten nothing. We’d have been a distant water fishery.”

As an added bonus for the state, the debate also created something called the Community

Once passed over for the high-end crab, snow crab found a niche at family-style, all-you-can-eat seafood chains and the catch soared.



Snow crab.
Photo courtesy of ASMI.

Development Quota, or CDQ—an allocation of pollock to Bering Sea coastal communities to use for economic development purposes. The 7.5 percent allocation came from a reserve no longer considered necessary and was later expanded to include crab, cod, and other groundfish.

But inshore/offshore wasn’t over. The debate renewed itself every three years until 1998, when, tired by the continuing feud, the offshore sector proposed to transfer more pollock onshore in return for a new idea to rationalize their fishery through harvesting co-ops. Successfully used in the whiting fishery off Washington and Oregon, the co-op idea could allow the offshore processors to reduce their overcapitalized fleet, slow down the pace of the fishery, and boost production yield.

When the North Pacific Council didn’t completely buy off on the plan, both sides flew to Washington DC and asked Senators Stevens and Slade Gorton of Washington to mediate the dispute. What eventually emerged was a

complicated legislative fix called the American Fisheries Act.

“The AFA was a legislative solution that dealt with the pollock allocations, harvesting co-ops, and U.S. ownership issues,” said Dave Benton, who helped negotiate the agreement for the state. “It shifted pollock quota from the offshore to the onshore sector—with shoreside compensating the offshore sector for their loss; it set criteria for which vessels would be in or out and bought out a bunch of factory trawlers.”

Alaska also insisted the legislation include increased observer coverage and controls on so-called “sideboard” fisheries so the displaced pollock boats didn’t simply move to other fisheries. When it was signed into law in 1998, the bill also increased the CDQ allocation to 10 percent.

With an end to the bitter in-fighting between sectors and the needs of local communities included in the agreement, the Bering Sea groundfish fishery was finally fully Americanized. The impact to region was significant.

“In the 1990s, Dutch Harbor went from a frontier town to a real community of 4,000 people with schools, a clinic, paved roads; all of that,” Benton said. “The CDQ program helped villages get jobs and money, and also economic opportunities and enterprises for those who wanted to stay in the village. The American Fisheries Act facilitated all of those and put to bed the very, very contentious allocation fight over pollock which is one of the largest fisheries in the country, if not the world.”



Bristol Bay Economic Development Corporation vessel F/V Bristol Leader is a 167-foot freezer longliner that harvests cod, sablefish and halibut.
Photo Herman Savikko, ADF&G.

“AFA facilitated all of those and put to bed the very, very contentious allocation fight over pollock which is one of the largest fisheries in the country, if not the world.”

—Dave Benton



Pollock.
Photo courtesy of ASMI and Dr. Donald Kramer.

Shaping Alaska's History

Halibut Derby

It wasn't by accident that Pacific halibut became one of the first fisheries to come under scientific management. The big flatfish, famed for its firm white flesh, was overharvested early in the 20th century. Worried about halibut's future, one of the smartest management biologists of the day was asked to investigate.

William F. Thompson's pioneering research produced recommendations for the management of the fishery and led to a 1923 treaty be-

tween the U.S. and Canada that created what's now known as the International Pacific Halibut Commission. Halibut has had its ups and downs since then, but the International Pacific Halibut Commission has kept a tight rein on the harvest to sustain the fishery and maintained a program of scientific research to better understand its biology.

Since it was managed under a preexisting treaty, the halibut fishery was not affected by statehood or

the 200-mile limit law, although the Magnuson-Stevens Act assigned allocation decisions regarding the fishery to the North Pacific Council. Those latter concerns quickly came to the forefront.

As Alaska's population grew and halibut stocks prospered, more and more fishermen were attracted to the fishery. As effort rose, fishing seasons became shorter. Seasons that once lasted months were reduced to just weeks.

Fishery managers considered limited entry for halibut in the early 1980s but the idea ran afoul of President Ronald Reagan's opposition to government regulation. Talk soon turned to Individual Fishery Quotas or IFQs. While limited entry set a cap on the number of participants, IFQs went a step further and assigned a specific catch quota to each.

While options for the halibut fishery were discussed, the situation only got worse. As people sensed some form of pending limitation, more and more Alaskans entered the fishery in hopes of being grandfathered in later. As the number of participants grew, openings became even shorter. By the early 1990s, there were some 5,000 participants in the Alaska halibut fishery and the season was reduced to a few 24-hour periods a year.

Called the "derby" fishery to describe the race for fish, it had several consequences, almost all of them bad. At its worst, the derby was dangerous. "I considered the system we had was murder," said Clem Tillion, who served as Alaska's "Fish Czar" in the early 1990s. "You send all these little boats out to fish regardless what kind of weather it would be. And if they didn't go out that day they lost their whole season."



A 300 lb. halibut landed in Juneau on December 20, 1910.
Photo courtesy of Alaska State Library Photograph Collection.

Shaping Alaska's History

Fast paced, it was also difficult for fishery managers to control the catch under the derby, and with millions of pounds of halibut delivered all at once, product quality suffered. Rather than being sold fresh, most Alaska halibut was frozen, adding the expense of cold storage.

“A good fishery should deliver a quality product to the consuming public at a competitive price,” Tillion said. “Our halibut was a third-rate product dumped on the dock in one or two days. The public was paying more for the cold storage and interest on the debt than they were for the fish. The only way I could see to stop this was an IFQ system. It slows things down enough that it makes some sense and produces a quality product to the consuming public.”

Adopted by the North Pacific Council in 1995, over 4,800 fishermen initially received quota, but many fishermen who only received a small share opted to sell their quota. By 2005, the number of share holders had dropped by a third, although quota caps prevented any one individual from acquiring too large a stake in the fishery. There was an even steeper reduction among vessels as quota holders combined efforts. The halibut fleet shrank from 3,450 vessels in 1994 to fewer than 1,300 boats in 2005, a reduction of more than 60 percent.

IFQs remain controversial to those who lost jobs. Communities like Pelican, near Southeast Alaska's Fairweather grounds, suffered from loss of the seasonal influx of derby fishermen. Because IFQs were transferable, questions were raised about out-of-state quota ownership and the difficulty and expense for young people to enter the fishery.

But Clem Tillion says IFQs succeeded in meeting its intended goals. “We don't drown a bunch of

“Prices are up because the quality is up.”

—Clem Tillion



Pulling a halibut on board.
Photo courtesy of ASMI.

fishermen every year,” Tillion said. “Prices are up because the quality is up. We don't have a huge amount of gear left on the grounds and fishing even when the season is over. I believe the free market does a bet-

ter job of regulating things. There is need of government regulation because there are bandits that would overharvest but, all in all, it's an unbelievable system.”

Shaping Alaska's History

Perestroika

Climate change in the 1990s reshaped fisheries across the North Pacific but this time, the shift was in the geopolitical climate. Economic and political reforms swept through Russia and the old Warsaw Pact in the late 1980s. The Berlin Wall toppled and the Iron Curtain was lifted across Eastern Europe. In Alaska, it was called the thawing of the Ice Curtain. New contacts between the former cold war enemies began on a personal level and soon got down to business.

Initially the Russians were interested more in economic partnerships and joint ventures, but it soon became apparent they didn't like the International North Pacific Fisheries Commission any more than Alaskans did. Perhaps even more so since, as cold war opponents, they weren't included in the earlier agreement. As Steve Pennoyer and David Benton from the Alaska Department of Fish and Game Commissioner's office started talking with the Russians, they saw an opportunity to fundamentally change fisheries in the North Pacific. The breakthrough came during a meeting in Leningrad, now St. Petersburg.

"While everybody else was touring the town Pennoyer, a few NOAA people, and myself closeted up with three or four Russians in this dingy little room for three days and hammered out a proposal for a new salmon treaty," said David Benton, then the Department's director of International and External Fisheries. "Then we took it to Japan and Canada, which caused great consternation because we were talking to the Russians without talking to our allies first, but we eventually got them on board and after some very intense negotiations, we got the NPAFC done."

Formed in 1992, the North Pacific Anadromous Fish Commission ended the high seas harvest of salmon from

New contacts between the former cold war enemies began on a personal level and soon got down to business.

Alaska and other countries throughout the region. It brought the new Russian Federation and later Korea in as members, and shifted the focus from allocation to conservation and research. It also notably allowed all members to enforce its provisions within the North Pacific, a significant change known as non-flag state enforcement. Previously fishing vessels on the high seas only had to answer to enforcement ves-

sels that flew their own flag. Non-flag state enforcement created a new level of transparency in fisheries enforcement on the high seas.

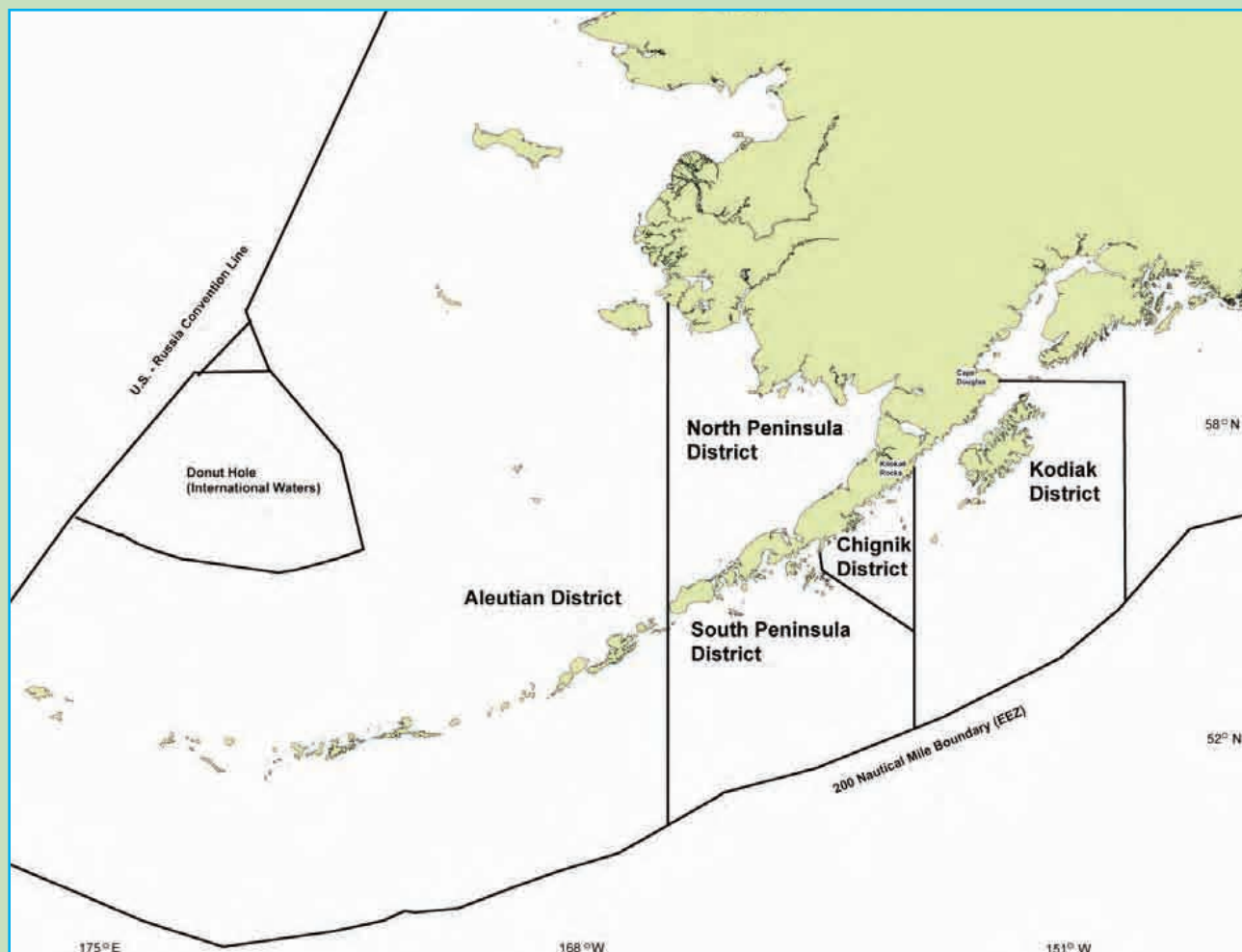
At the same time, separate meetings were underway about the high seas squid problem and the breakthrough on non-flag state enforcement helped reach agreement on a management and enforcement regime for that driftnet fleet. It soon grew into an international effort to ban all high-seas driftnetting. Senator Ted Stevens convinced the Secretary of State to make it a priority, and the state helped muster what was then the largest public lobbying effort ever before the United Nations.

"We got hundreds of people from 30 plus countries to come to the United Nations and talk to their respective delegates." Benton said. "We had Christopher Reeve—



i i f North Pacific Anadromous Fish Commission in 1993. L to R: David Benton, Deputy Commissioner ADF&G; Rick Lauber, Chairman North Pacific Fisheries management Council; Steve Pennoyer, then with the National Marine Fisheries Service and William Dilday, U.S. Department of State. Photo courtesy of Dave Benton.

Shaping Alaska's History



The Bering Sea Donut Hole.
Map ADF&G.

Superman—host a reception for UN delegates from 80 to 100 countries and it was all about stopping drift-nets. Our office funded a big chunk of that and in the end, it was a very cheap investment. It was part of what finally got rid of high seas drift-nets.”

The United Nations ban on high seas driftnets took effect in 1993. The new alliances and enforcement regimes later led to a 1994 agreement that ended pollock fishing in the Bering Sea Donut Hole. Combined, the new international agreements on salmon, driftnets, and

pollock profoundly changed how we managed high seas fisheries that impacted Alaska stocks, and it all came from a shift in the political climate. The Russian word used

to describe the sweeping changes across their country was perestroika or “restructuring.” In the 1990s, it came to the fisheries of the North Pacific as well.

Combined, the new international agreements on salmon, driftnets, and pollock profoundly changed how we managed high seas fisheries that impacted Alaska stocks, and it all came from a shift in the political climate.

Shaping Alaska's History

Pacific Salmon Treaty

Biologists will tell you that all salmon in Alaska are Pacific salmon; part of the genus *Oncorhynchus*, Latin for “hooked nose,” a reference to their metamorphosis before spawning. But the Pacific Salmon Treaty deals with a specific issue: stocks that freely roam across the borders of the Pacific Coast states, British Columbia and Southeast Alaska.

Salmon migrate thousands of miles during their lifetime and when they cross state or national boundaries there's usually a fight over whose fish they are. Transboundary fish disputes have been around ever since man used a river as a convenient border. Tensions between Alaska and Canada were apparent as early as 1914 and escalated in the following decades as coastwide salmon runs declined primarily because construction and operation of

hydroelectric dams and other development damaged salmon habitat. Fishing opportunities down south were also constrained by court rulings.

“We really were in a bad situation because there was the Boldt decision for the tribes, conservation concerns for the lower 48 and huge allocation issues between the Canadians and the lower 48,” remembered Gary Slaven, a Petersburg fisherman who was part of the team of Alaskans that tried to negotiate the original coastwide salmon treaty.

“We were kind of collateral damage. It was hard to make people realize that we lived and died with our fisheries up here. We had to have them. Buy-out wasn't an option. If you sell out and get a check, the money's soon gone and the families are gone so it was hard. We had to

go down and just be real hard headed about keeping the troll fishery, including the winter troll fishery, and say we've been catching these fish for a long time and we're not willing to give them away to somebody else.”

Negotiations over the treaty began in the early 1970s and went on for years. The disputes over fisheries in the north focused on the Taku and Stikine Rivers which rise in Canada and flow through southeast Alaska and Alaska's mixed stock fishery off Noyes Island, but perhaps the greatest controversy centered on the prized Chinook salmon which may migrate more than 1500 miles from their natal stream through the waters and fisheries of both countries. The issues were complicated and contentious. One year Slaven spent 117 days in treaty negotiations in Seattle and Vancouver but Alaska held fast to reaching an agreement intended to protect the stocks as well as the fishery.

“We had information that showed that if we stuck to 263,000 kings that we could rebuild the coastwide stocks, the ones we impacted, in three cycles or 15 years,” Slaven said “Of course, history later bore us out. We got the abundance back up even with all the environmental problems and the problems they have in Canada.”

It took 15 years to negotiate the Pacific Salmon Treaty between the U.S. and Canada and when it was finally signed in 1985 the press reported the terms were generally considered favorable. But nobody specifically seemed to like it. Alaska fishermen didn't like the fact that their catch was cut back and Canadian fishermen thought the Americans got a better deal than they did.

Within a few years, the rancor over catch allocations had returned and by the early 1990s the treaty



This map illustrates various Chinook salmon migration patterns in the Gulf of Alaska and the current Pacific salmon management authorities that govern them.

Shaping Alaska's History



Canadian fishing boats block the Alaskan ferry Malaspina at the dock in Prince Rupert, B.C., on Sunday July 20, 1997. The three-day blockade was intended to put pressure on stalled salmon treaty talks but ultimately cooler heads prevailed. AP Photo/Ian Smith.

commission deadlocked and was unable to agree on annual catch quotas. The listing of salmon returns to Idaho's Snake River and California's Sacramento River under the Endangered Species Act raised the stakes and brought salmon management issues into the courts. As tempers over allocation issues rose, Canadian fishermen twice blockaded Alaska state ferries including one in 1997 that was held in Prince Rupert for three days. Tourists had become collateral damage and the two sides were no closer to resolving the contentious issues involved.

Ultimately cooler heads prevailed. Alaska led the way, proposing to replace the past fixed quotas with an abundance-based approach, similar to the winning management strategy employed since statehood.

"We got away from hard and fast ceilings and quotas and got back to a system where conservation came first and allocation became a secondary function of the management regime," said David Benton, who helped the state negotiate revised treaty provisions in 1999. "In doing so we set up the conservation burden so that the allocations were fair."

The approach was sold on the concept of "share the pain, share the gain." Alaskans were willing to cut their catch for conservation reasons but wanted to share in the upside when salmon were abundant. Signed in 1999, the new treaty indeed caused pain for salmon trollers and sport fishermen with catches that were initially held below 200,000 Chinook by low abundance, but the new abundance-based provisions allowed for Alaskan harvests of over 400,000 kings when stocks later rebounded.

It was a breakthrough. For the first time biologically-based escapement objectives were set. These, among other expectations, were put on all parties: Alaska, Canada, and the southern U.S. States. Substantial funding was put into the mix to make those tasks doable.

The 10-year fishery provisions agreed to in 1999 were slated to terminate at the end of 2008, necessitating renegotiation of the treaty terms. While the 1999 agreement established effective conservation and harvest sharing arrangements for a number of fisheries, provisions affecting the Chinook fisheries

require scrutiny for their affect on numerous Chinook salmon stocks in the Pacific Northwest that are now listed under the Endangered Species Act.

"The migration of Chinook salmon across jurisdictions and the varying status of the stocks originating from the Pacific Northwest and Canada make reaching comprehensive domestic and international agreement on conservation and fishery issues very difficult," said Deputy Commissioner David Bedford. "The controversy that often characterized the treaty negotiations was a measure of the value of the salmon to both nations."

The approach was sold on the concept of "share the pain, share the gain."

"In 1999 the United States and Canada reached an agreement that has stood the test of time and many fishery provisions can be renewed with little or no change." Bedford observed. "However the negotiation of Chinook fisheries raises the added complexity of ensuring that an international agreement is sufficient to meet the conservation needs of both countries. At all times in the negotiations, the best interests of the salmon resource and of the fishermen and fishery dependent communities in Southeast are foremost in our minds."

Shaping Alaska's History

Community Development Quotas

As Alaska's lucrative pollock fishery was being Americanized, villagers in western Alaska wondered what was in it for them. They lived along the Bering Sea, depended on its bounty to subsist and shared a stake in the stewardship of its resources.

The joint venture era provided an opportunity for them to get involved. In the early 1980s, after domestic processors refused to buy gillnet-caught herring at Togiak and 5,000 tons of fish was wasted, local gillnetters turned to a Japanese longline company that promised to buy all their herring. In return, the Japanese wanted a share of cod. Called "fish and chips" deals, they were politically popular, trading off the last allocations of foreign-directed fishing for markets for resident small boat fishermen—like herring in Togiak or salmon in Norton Sound.

Fish and chips went stale as the last directed foreign allocations were phased out by the domestic groundfish fleet, but a Bethel man had an idea to keep local fishermen involved. Harold Sparck came to the Yukon-Kuskokwim region in 1968 as a teacher but soon quit in a dispute over policies he felt went against the local Yup'ik students. He put down roots, married into the community, and embarked upon a quarter-century of activism.

Sparck lobbied for a rural subsistence preference and plotted a legal strategy that eventually pushed the Japanese International North Pacific Fisheries Commission fishery out of Alaska waters. He forged ties with the Soviets as the Ice Curtain thawed and helped craft a new salmon treaty that was focused more on conservation than allocation. Along the way, Sparck earned the ire of some Alaskans, such as residents of the Eastern Aleutians

whom he battled over catches of chum salmon, but no one doubted his single-minded devotion to the Yukon-Kuskokwim region.

In the early 1990s, Sparck saw a way to include Bering Sea coastal villages in the Americanization effort by giving them a small allocation which they would then partner with industry in return for jobs, training and economic development. The allocation came from a reserve that was previously set aside but no longer considered necessary. Partnering with industry was a brilliant idea, merging the interests of small villages that suffered from chronic unemployment with major fishing corporations.

Called Community Development Quotas or CDQs, the idea was adopted by the North Pacific Council in 1992 but Harold Sparck did not live

to see its eventual success. He died of cancer in 1995 at age 51. In the years that followed, CDQ corporations grew beyond anyone's expectations, producing annual revenues of up to \$130 million and over \$1 billion since their inception.

Later expanded to include crab, cod and other species, CDQs created some 2,000 jobs annually and funded programs that train thousands more for jobs in the seafood industry. The corporations have invested their revenues in both factory trawlers and shore based plants worth over \$400 million and at the local level, have also funded docks, harbors, cold storage and ice plants, and other seafood processing facilities that had a big impact in small villages.

The impact of CDQs can be seen by comparing communities that were



Pacific Glacier, a Norton Sound Economic Development Corporation (NSEDC) vessel. NSEDC is half-owner of this former Glacier Fish Company vessel which allows it to harvest its allocation of CDQ pollock and Pacific cod.

Photo Herman Savikko, ADF&G.

Shaping Alaska's History



Arctic Sea, a Coastal Village Fishing Cooperative (CVFC) vessel.
Photo Herman Savikko, ADF&G.

included in the program with those that were not. A former ADF&G fishery manager who now works for the Norton Sound CDQ group, Charlie Lean previously managed small but active salmon fisheries in Unalakleet and Kotzebue through the late 1990s when eroding markets and rising costs took their toll. Unalakleet was part of a regional CDQ corporation but Kotzebue, which didn't border on the Bering Sea, was not.

"Today, the Kotzebue commercial fishery employs less than 10 percent of its former participants and catches about 20 percent of the previous average harvest," Lean said. "Unalakleet fisheries, however, are not far

off the catch and participation levels of the previous decade. In fact, the commercial crab fishery is far more active than it used to be."

That's because the Norton Sound Economic Development Corporation invested in research, financing and infrastructure. "Without the CDQ sponsorship of eastern crab surveys, the boat and gear loan programs, and ice production those fishermen would not have near the opportunity they currently enjoy," Lean said.

"The CDQ has also kept open the buying stations in the outlying communities and traditional villages like Elim and Shaktoolik are also able to sell their fish and have much

the same opportunity they enjoyed in past decades. The communities of eastern Norton Sound are economically far more stable than those of Kotzebue Sound. They are able to support young families and the breadwinners live and work at home."

From Norton Sound to the Yukon, Kuskokwim, Bristol Bay and the Aleutian and Pribilof Islands, Harold Sparck's idea has grown into the largest economic engine in the region. Some believe CDQ corporations will eventually grow to control the fisheries throughout the Bering Sea.



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.

...the Department led the effort to standardize genetic markers and databases among different agencies and nations.

“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

“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

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

"Salmon embody the connections between the oceans and the upland watersheds which sustain us all."

—John White

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."



Epilogue

Five by Five

To appreciate the dramatic change in Alaska's commercial fishing industry during the past five decades of state management, consider the harvest statistics from the beginnings of statehood to 2007, the most recent year for which complete catch data is available.

In 1959, the first year of Alaska statehood and the last year of federal fishery management, Alaska produced 324 million pounds of seafood worth almost \$29 million. In today's dollars, that would be about \$204 million.

The salmon catch, 25 million fish, accounted for 45 percent of the annual harvest in pounds and 73 percent of the value, \$21 million. Herring comprised much of the rest of the volume (107 million pounds), and halibut comprised much of the rest of the value (30 million pounds), worth \$4 million.

Shellfish, mostly king crab and shrimp, totaled 37 million pounds and had a value of \$2.4 million. Groundfish, almost all sablefish, totaled 2.3 million pounds worth under \$200,000. This doesn't include the groundfish, crab and salmon caught by foreign fleets off Alaska waters—the volume of which is not well reported but the value to the state was nothing.

Compare that to 2007, when Alaska's fish harvest totaled 5.3 billion pounds, more than half the nation's seafood landings. When compared to other fishing nations, Alaska would rank ninth in the world behind Norway but ahead of the Philippines. The total catch was worth \$1.5 billion dollars to the fleet and over \$3 billion at the first wholesale level.

The vast majority of the catch was pollock, a species not even targeted in 1959. Over 3 billion

pounds of pollock, worth about \$300 million, were landed in the Bering Sea and Aleutian Islands. Along with that, fishermen landed 350 million pounds of cod worth \$150 million plus other flatfish and rockfish that boost the total groundfish catch in the Bering Sea and Gulf of Alaska to 4.1 billion pounds. Almost 400 million pounds of that groundfish was landed by the locally owned CDQ corporations.

Alaska produced 213 million salmon in 2007, or 950 million pounds worth \$417 million. While pink salmon made up more than half that catch, (504 million pounds); more than half the value, \$248 million, came from the 48 million sockeye that were landed. Private Non-Profit hatcheries released 1.5 billion salmon fry and saw 80 million adult returns. Of those, 80 percent were pink salmon and 15 percent were chums.

Over 51 million pounds of halibut were landed in Alaska waters in 2007, mostly in the Gulf of Alaska and off the Southeast Panhandle. At \$5 a pound, the catch was worth over \$250 million.

Well down from its peak production, 65 million pounds of shellfish were landed in 2007 worth \$133 million. That included 19 million pounds of king crab worth \$59 million and 36 million



Geoduck.
Photo ADF&G.



Measuring a sea urchin.
Photo ADF&G.

Left: Biologists tagging McNeil River chum salmon.
Photo Ted Otis, ADF&G.

pounds of snow crab and other tanners, worth \$50 million. Shrimp, Dungeness crab, scallops, clams, geoducks, sea cucumbers and sea urchins accounted for the rest.

After a spectacular marketing rise and fall, one fishery was little changed over the half century. In 2007, Alaska produced 63 million pounds of herring but with the downturn in the roe market, the catch was worth only \$9.3 million. In 1959, Alaska produced 107 million pounds of herring worth \$9.2 million in 2007 dollars.

In five decades of Alaska statehood, seafood production has increased by five billion pounds and done so in a responsible, sustainable manner.



Seiner.
Photo courtesy of ASMI.

What It Took

Ask former biologists from the Alaska Department of Fish and Game and others involved in the industry's development what it took to achieve the success seen in Alaska's commercial fisheries and they will attribute multiple reasons. At perhaps its most basic level, it begins with Alaska itself.



Trolling for coho salmon.
Photo courtesy of ASMI.

"It's difficult to say what the key to our success was but if I had to say one thing, it's probably the habitat," said Jeff Skrade. "Preserve the habitat and there's no reason that this can't go on. The term renewable resource is what's paramount in my mind. The world's going to need this protein. If you take care of it and protect the habitat, there's absolutely no reason this couldn't go on from now until forever."

It also took firm leadership to task the Department with rebuilding the fisheries and Andy Anderson's clear-headed direction of resting ultimate control of the fisheries with his local managers. "Emergency Order management is what saved Alaska fisheries: letting the local managers do their job," said Ken Florey. "If you get a manager who lives locally in the community, understands the resource, knows the

"If you take care of it and protect the habitat, there's absolutely no reason this couldn't go on from now until forever."

—Jeff Skrade



Tendering salmon.
Photo courtesy of ASMI.

people, has a feeling for what's going on and the fisheries over time, you get a better managed fishery. That's the key and that's why Alaska has been so successful."

It took the application of science to understand the runs and shape effective management programs. "Good stock assessment and in season management has allowed the Department to identify the surpluses when they occur and direct the harvest of those stocks," said Steve Pennoyer. "This regulatory flexibility simply did not exist during the federal era and combined with the effective management of these resources is what sustains this productivity."

It took setting that science apart from the economic interests of those involved. "The brilliant thing that Clarence Anderson left us with was separating the people who protect the resource from the people who allocate the resource," said Clem Tillion. "The Board of Fish has no say over how many pounds are available so the Department was in the business of protection of the resource; the Board of Fish was in the allocation of that resource and the two were not mixed. When we formed the North Pacific Council under Elmer Rasmuson and Harold Lokken, we took the state system that worked so well. We might disagree with the SSC, the Scientific and Statistical Committee, but when they vote, that's final. We have never overridden them."

Public involvement in the regulatory process also contributes to Fish and Game's success. "The involvement of the public was very im-

portant, basically ensuring we have a biological escapement goal: it takes fish to make fish," said Jeff Skrade. "If the people in the fishery—both industry and the fishermen—hadn't sacrificed to achieve those escapements and have been so supportive of the Department to do that, it never could have happened."

It took a generational change on the part of industry to realize that fisheries wouldn't be managed "Greyhound style" anymore, and to embrace the state's new scientific style. "I think what happened this year demonstrates the success of what we're doing," said Sen. Ted Stevens. "The pollock quota was reduced and I didn't get one letter of protest from anybody. They all knew that was a scientific decision and they all supported it."

"The brilliant thing that Clarence Anderson left us with was separating the people who protect the resource from the people who allocate the resource."

—Clem Tillion

It also took recognition of external threats to Alaska's resources such as high seas interceptions and investing the time to address these



Halibut delivery to processing plant.
Photo courtesy of ASMI.

at an international level. “When I started out in high seas enforcement, we really were working with the 3-mile limit and it wasn’t much of a law,” said Jim Branson. “It was a customs regulation, actually, that forbade foreign fishing within 3 miles of the beach and over the years that got moved out to six, 12 and finally to 200 miles.”

“The Department was the catalyst for all of this,” said David Benton. “We took our policy objectives: to protect our resources and our communities and the larger marine ecosystem, to every corner of the planet; to the highest levels of the United State government and to the highest levels of foreign governments and even the United Nations. The Department of Fish and Game really burst onto the world stage. It truly was a remarkable period of time.”

They also admit it took forces outside of our control. “I still think Mother Nature is the prime driver in all these things but had there not been an Alaska Department of Fish and Game what Mother Nature made we could have

The Department of Fish and Game really burst onto the world stage. It truly was a remarkable period of time.”

—David Benton

eliminated just like the passenger pigeons,” Chuck Meacham Jr. said. “There’s no question the Department of Fish and Game played a major, major role, in what we have today and what I’d like to think we’ll have for centuries.”

It took the commitment and hard work of many. “I’ll tell you, it was day and night, 20 hours a day, head down and ass up, and we never stopped,” said Chuck Meacham Senior. “In those days, I’d take off about the 28th of May when king salmon fishing began down around Copper River and then from there go to the king salmon fishery in the Nushagak and



“Setnetting” or set gillnet fishing.
Photo courtesy of ASMI.



Bering Sea crab fishery.
Photo courtesy of ASMI.

then up to the Yukon when the ice'd go out and from there back to Bristol Bay, over the hump to Cook Inlet, then charter a plane through the slot to Prince William Sound. I'd get home about the end of August."

Ultimately it took all of the above. "There's no doubt that the dramatic recovery of the salmon in Alaska has been in large part due to improved natural survival conditions and reduction of high seas interceptions," said Steve Penoyer, "but the effective management of these resources is what both sustains this productivity and allows harvest of these tremendous surpluses of fish beyond escapement needs."

"Obviously the main thing is that we've maintained the habitat. You've got to have that or you won't have any fisheries period," said Ken Florey. "You've got to have the habitat, you've got to have the local, on-the-spot management and you've got to have input from local, knowledgeable fishermen who feel they're part of what's going on. If you can keep that all

together and keep the politics out as much as possible, you'll have a well managed fishery."

For former fish board chairman John White of Bethel, it also took recognition of the traditional knowledge of people who has survived off the resource for thousands of years.

"Traditional knowledge is not only an important part of the management structure, it's an important part of the research structure. The art of how to bring traditional knowledge into western science is something that has to occur in the future. It's not a question of 'if,' it's a question of 'it must' and we are striving to do that in the best ways possible. While the recognition of traditional knowledge has improved, the ability to incorporate it and bring it together with western science is still in its infancy and will need careful stewardship in the future for it to succeed."

"There's no question the Department of Fish and Game played a major, major role, in what we have today and what I'd like to think we'll have for centuries."

—Chuck Meacham Jr.



Cannery workers in Dillingham.
Photo courtesy of Bob King.

Challenge for Tomorrow

Alaska's success in fishery management over the past five decades is a matter of record but its future is not necessarily assured. Alaska fisheries face serious challenges in the years ahead.

Global climate change and ocean acidification are affecting the waters on which Alaska's and all fish stocks depend. Some species already appear to be on the move. Alaska pollock are reportedly heading north in search of cooler water while southern species like jumbo squid and sardines are becoming more abundant in Alaska water. Tuna might not be far behind.



Collecting salmon eggs from the Branch River system in Bristol Bay.
Photo John H. Clark, ADF&G.

The long term implications of this climate shift are not known but the warming trend is generally considered favorable for invasive species, some of which prey on Alaska's commercially important stocks. Others, such as escapees from salmon net pens, threaten to bring sea lice and disease from afar.

With a growing human population, there is increased pressure on Alaska's renewable resources and habitat. Competition between commercial and sport users is on the rise for both halibut and salmon. Planned industrial development, both onshore and off, raises concerns over protection of fish habitat and water quality.

On the high seas, a resurgence of Illegal, Unregulated and Unreported fishing effort targets multiple species sold to hungry markets overseas where they don't ask where the fish comes from. Plastic marine debris, much of it carried from afar by ocean currents, is choking Alaska's shoreline.

The unexpectedly poor return of pink salmon in 2008 raises questions that beg to be answered. King salmon abundance declined just as the Pacific Salmon Treaty came up for renegotiation and right after bycatch of the coveted kings by the Bering Sea trawl fleet set an unwelcomed new record.

King and Tanner crab remain mired at a low level of productivity and some fisheries have been closed to fishing for decades. Meanwhile, escalating fuel prices threaten the viability of many Alaska fisheries and entire coastal communities dependent on a fish-based economy.

The challenges fisheries face today require the same commitment, research and investment that allowed Alaska fisheries to rebuild and prosper since the early days of statehood, but many of the biologists, managers and policy makers who are justifiably proud of the Department's past accomplishments openly question whether that commitment is still there.

One former biologist observed that the Department of Fish and Game was better supported before the oil pipeline brought its riches to the state. At statehood, fisheries were a major driver of Alaska's economy but now are



ADF&G researchers arrive in Bristol Bay by floatplane.
Photo John H. Clark, ADF&G.

a distant second to oil and gas. As oil revenues fluctuated in the 1980s and 1990s, many basic management research projects were pared back or cancelled.

Once a world leader in fish culture, the Department's leadership in the science of rehabilitation and enhancement stalled after elimination of the FRED Division. Competitive pay and benefits that previously attracted many to state service also stagnated. So many seasoned biologists were lured away by federal or private sector jobs that one former biologist likened the Department to a "recruiting agency."

The challenges facing Alaska fisheries in the next fifty years will require a renewed commitment by the state leadership to the basic research on the status of fish stocks and with specific attention to the broader global climate changes that are already evident today.

*With renewed
commitment
and investment
Alaska will
continue to be a
world leader in
fisheries*

It will require renewed investment in people, continuing education and training. It will require coordinated intergovernmental action to address pirate fisheries on the high seas through stricter laws and enforcement.

Fortunately, Alaska fisheries have been

built on a firm foundation: a constitutional mandate for sustained yield, the vision of Andy Anderson, a commitment to scientific research, and to serve the Alaska people. With renewed commitment and investment, Alaska will continue to be a world leader in fisheries.



North Pacific Seafood's processing plant at Pederson Point near Naknek.
Photo courtesy of Bob King.



**Challenge for
Tomorrow**

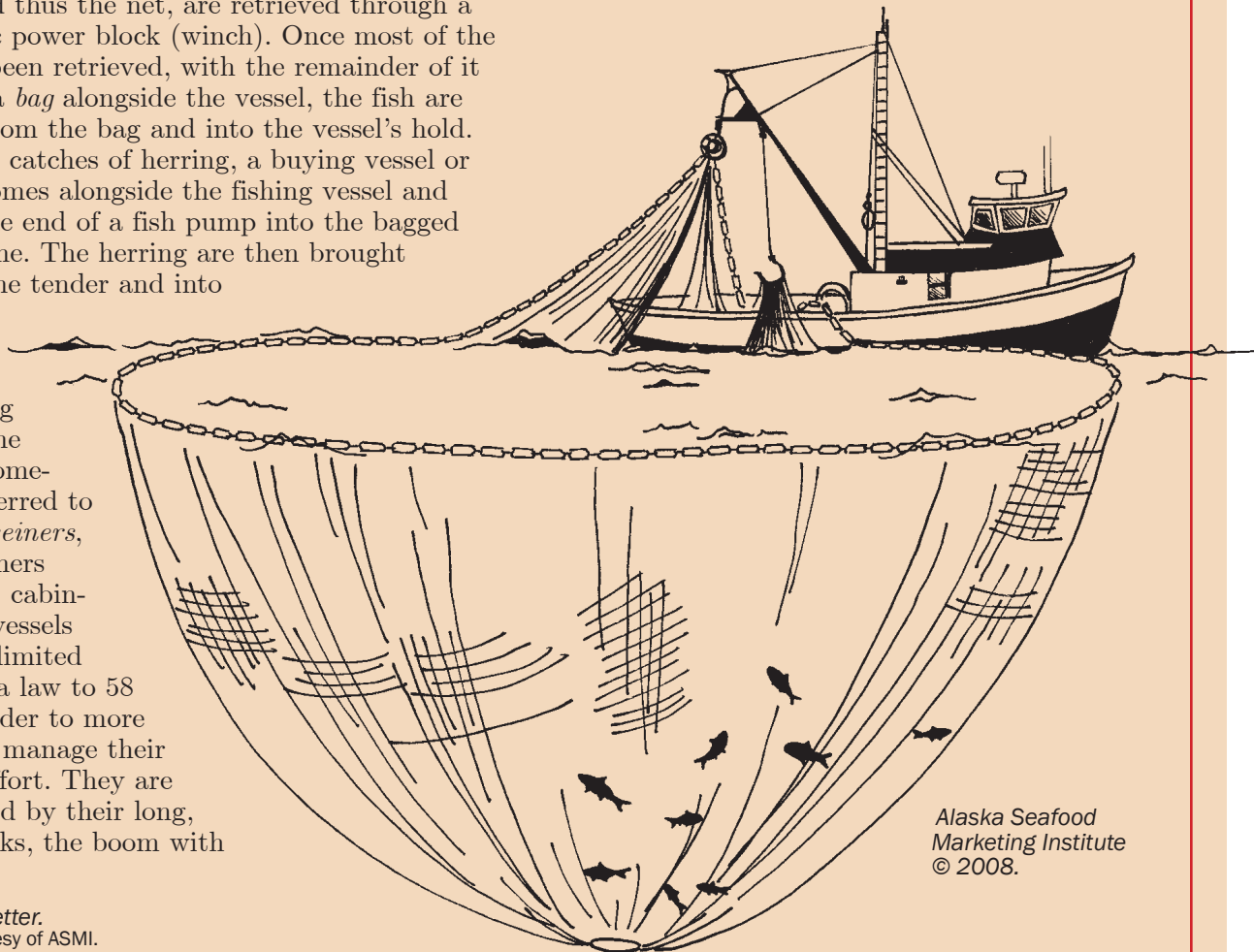
Types of Boats

Purse Seiner

Purse seiners catch primarily pink salmon and herring by encircling them with a long net and drawing (pursing) the bottom closed to capture the fish. The net is first stacked on the stern of the boat and then played into the water while the boat travels in a large circle around the fish. The far end of the net is attached to a power skiff, which holds the net while the seiner completes the circle. The top of the net stays on the surface of the water because of its *float line*—thousands of colorful floats—and the bottom of the net falls vertically because of its weighted *lead line*. As a result, the net hangs like a curtain around the school of fish. The vessel crew then purses its bottom with a *purse line*. The lines, and thus the net, are retrieved through a hydraulic power block (winch). Once most of the net has been retrieved, with the remainder of it lying in a *bag* alongside the vessel, the fish are dipped from the bag and into the vessel's hold. For large catches of herring, a buying vessel or tender comes alongside the fishing vessel and lowers the end of a fish pump into the bagged purse seine. The herring are then brought aboard the tender and into its hold

with-
out
ever going
aboard the
seiner. Some-
times referred to
as *limit seiners*,
purse seiners
are sleek, cabin-
forward vessels
that are limited
by Alaska law to 58
feet in order to more
precisely manage their
fishing effort. They are
recognized by their long,
clean decks, the boom with

its power block, the net stacked on the back, and the power skiff that is often seen riding piggyback aboard the vessel's stern while it is traveling. When fishing, of course, the circle of floats on the surface of the water, and the power skiff assisting with the operation, are sure giveaways. Seine-caught salmon are delivered *in-the-round* (whole) to buying stations and canneries where they end up as canned and frozen products. Herring are delivered to processing plants where they are either stripped of their roe (eggs), or packaged as bait for other commercial fisheries; e.g., the longline fisheries and the crab fisheries. Salted herring roe, called *kazunoko*, is shipped to Japan where it is a high-priced delicacy.



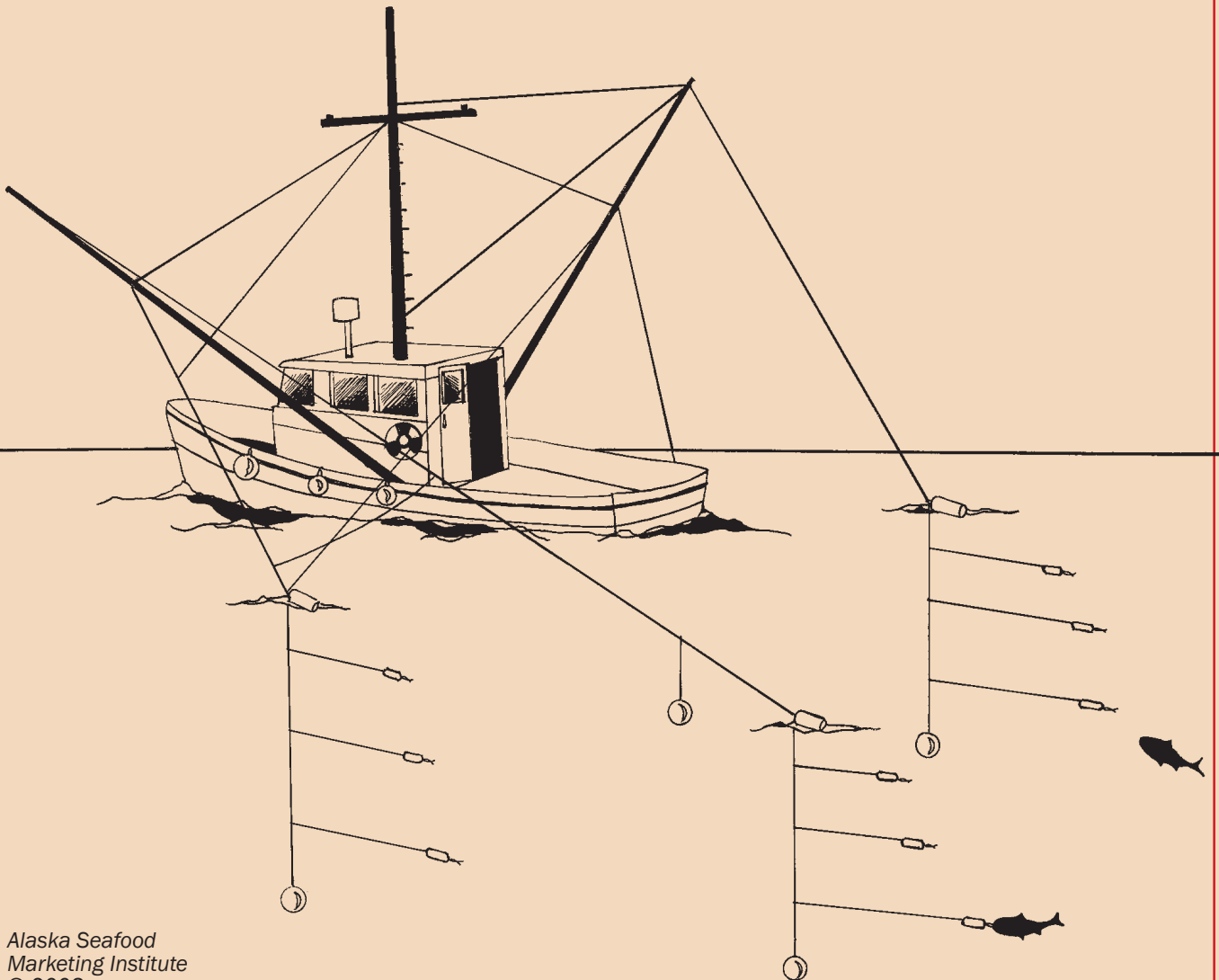
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Left: Gillnetter.
Photo courtesy of ASMI.

Troller

Troll vessels catch salmon, principally Chinook, coho, and pink salmon, by “trolling” bait or lures through feeding concentrations of fish. The word *troll* comes from a medieval German word, *trollen*, and refers to the revolving motion of the bait or lures used in this type of fishing. Typically, four to six main wire lines are fished, each of which may have up to a 50 pound lead or cast iron sinker or *cannon ball* on its terminal end, and 8 to 12 nylon leaders spaced out along its length, each of which ends in either a lure or baited hook. To retrieve hooked fish, the main lines are wound about small, onboard spools via hand crank (hand trollers) or with

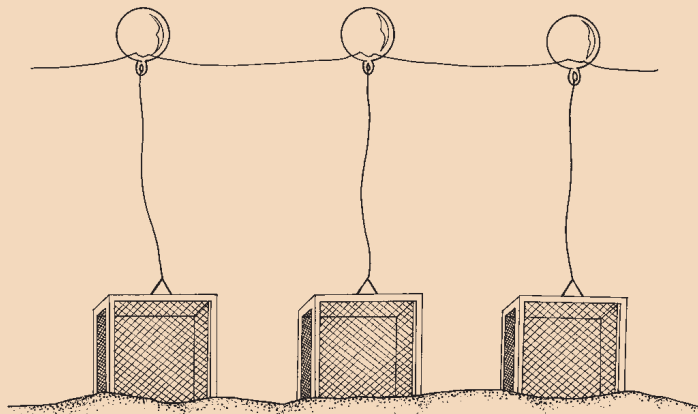
hydraulic power (power trollers), and the fish are gaffed when alongside the vessel. The leaders are then rebaited and let back down to the desired depth(s). Troll vessels come in a variety of sizes and configurations, ranging from small, hand troll skiffs to large, ocean-going power troll vessels of 50 feet or more in length. Troll salmon fishermen operate throughout Southeast Alaska in both state and federal waters. The troll salmon fishery produces a low-volume, high-quality product. Troll-caught salmon are dressed at sea and sold either as a fresh or frozen product. High-end grocery stores and fine restaurants are the final destination.



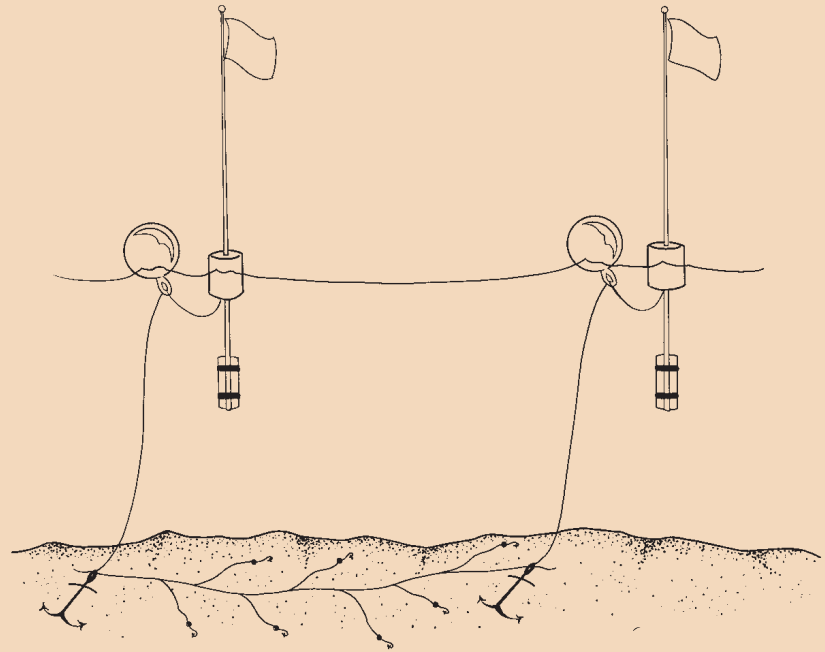
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Crabber

Crabbers target Dungeness, king, and snow crab using twine or wire-meshed steel pots (traps). Baited with herring or other fresh bait, the pots are left to *soak* for several days. A line extends from each pot to a surface buoy that marks its location. There are several configurations for the pots, though in general, the smaller round pots are fished for Dungeness in shallow bays and estuaries, and the large, heavy, rectangular pots are fished in waters deeper than 100 feet for king and Tanner crab. A power winch is used to retrieve the pots. Once aboard, a pot is opened and the catch sorted. Females and undersized males are discarded alive over the side and legal-sized males are retained in aerated seawater tanks. Crab boats come in a variety of shapes and sizes, from aluminum skiffs with outboard motors that fish the inside waters for Dungeness, to seagoing vessels of 100 feet or more that ply the Bering Sea and the Gulf of Alaska for king crab. Unless one happens to see a crabber headed for the fishing grounds with its decks stacked with pots, identification of a vessel as a crabber might be difficult for the casual observer. Crabs are delivered live to shore stations where they are cooked and then either canned or sold as a fresh or frozen product. A small number are sold live in local markets through retail outlets that have circulating seawater holding tanks.



Crabber. Alaska Seafood Marketing Institute © 2008.



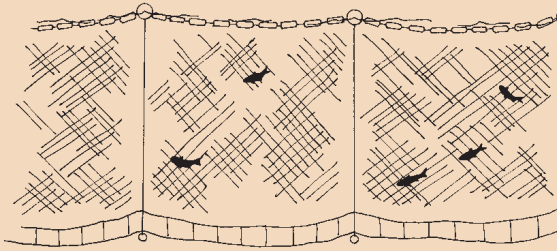
Longliner. Alaska Seafood Marketing Institute © 2008.

Longliner

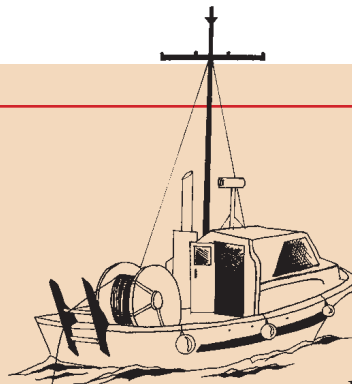
Longliners catch bottomfish, primarily halibut, blackcod, lingcod, and rockfish, via a long line that is laid on the bottom. Attached are leaders or *gangions* with baited hooks. Each longline can be up to a mile in length and have thousands of baited hooks. The lines are anchored at each end of each set. Lines at the ends run to the surface and are marked with a buoy and flag. A longline vessel typically sets several lines for a 24-hour soak. The lines are retrieved over a side roller with a power winch, and the fish caught are bled or dressed and then packed in ice in the vessel's hold. Longliners are typically large vessels, 50 to 100 feet in length, with a weather cover on the stern to protect the crew. The longlines are coiled and stacked on deck in tubs when not in use. Most vessels in this fishery can pack 20 to 40 tons or more of iced product before returning to port. Longliners are readily identified by their weather cover and, when not fishing, by the numerous orange buoys and flags that are tied along their rails. This fishery delivers its catch whole and bled (rockfish), or whole and gutted (halibut), or headed and gutted (blackcod and lingcod) for subsequent sale to fresh and frozen markets.

Gillnetter

Gillnetters catch salmon—primarily sockeye, chum, and coho—by setting curtain-like nets perpendicular to the direction in which the fish are travelling as they migrate along the coast toward their natal streams. The net has a float line on the top and a weighted lead line on the bottom. The mesh openings are designed to be



just large enough to allow the male fish, which are usually larger, to get their heads stuck, or *gilled*, in the mesh. Much larger fish and the smaller females are not so readily gilled. Gillnets work best in silty or turbid water which makes them difficult for the fish to see. Gillnet vessels are usually 30 to 40 feet long. They are easily recognized by the drum on either the front, a *bow picker*, or the stern, a *stern picker*,



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on which the net is rolled. Net retrieval is by hydraulic power which turns the drum.

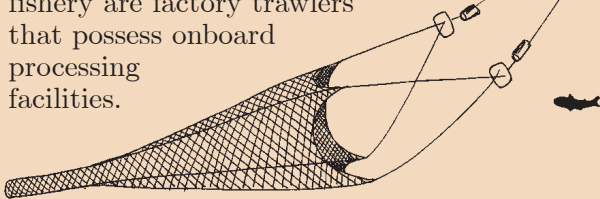
Fish are removed from the net by hand, *picking* them from the mesh as the net is reeled onboard. Gillnet-caught salmon are usually iced and delivered to buyers and cold storages. Historically, their ultimate destination was the canned market, though a growing market for frozen product has developed overseas.

Setnetting is a small-scale type of gillnetting done by hand from a skiff or from shore, usually by local families. There are no hydraulics. Nets are fixed and are held onshore or offshore with anchors.

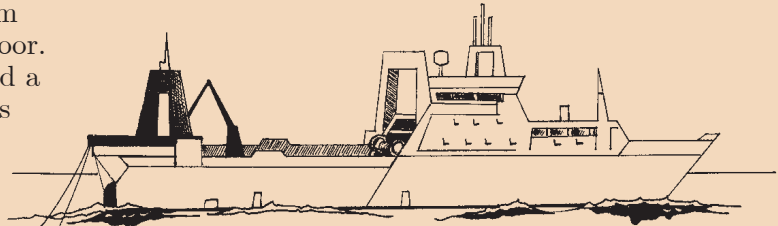
Skiffs are used to set nets—one end on shore, other anchored off shore. Sometimes both ends are in the water most of the time and when a cork bobs the fish is pulled out. After salmon are picked from nets they are iced down and delivered to large collection boats, called *tenders*.

Trawler

Trawlers are sometimes confused with trollers due to their similar sounding names. Trawlers typically catch large quantities of midwater species such as pollock or pink shrimp, and bottomfish such as flounder, by towing a large, cone-shaped net. Most trawl nets have *doors* on either side of the net's opening to help hold it open, and some that are fished near the bottom have a heavy chain strung along the bottom of the opening to hold it close to the sea floor. The net is retrieved using huge winches and a power drum upon which the net is rolled as it is brought aboard. The end of the net, the *bag* or *cod end*, holds the fish and is usually pulled right up into the back of the vessel on a slanting stern ramp. Trawlers are generally large vessels; the largest in the ocean pollock fishery are factory trawlers that possess onboard processing facilities.



These can be up to 600 feet in length. Catches are often enormous, with a two-hour tow of the net yielding up to 100 tons or more depending on the fishery, the size of the vessel, and the concentration of fish in the area. The trawl fishery may process its catches into either fillets destined for the fresh and frozen market, or minced fish called *surimi*, which is manufactured



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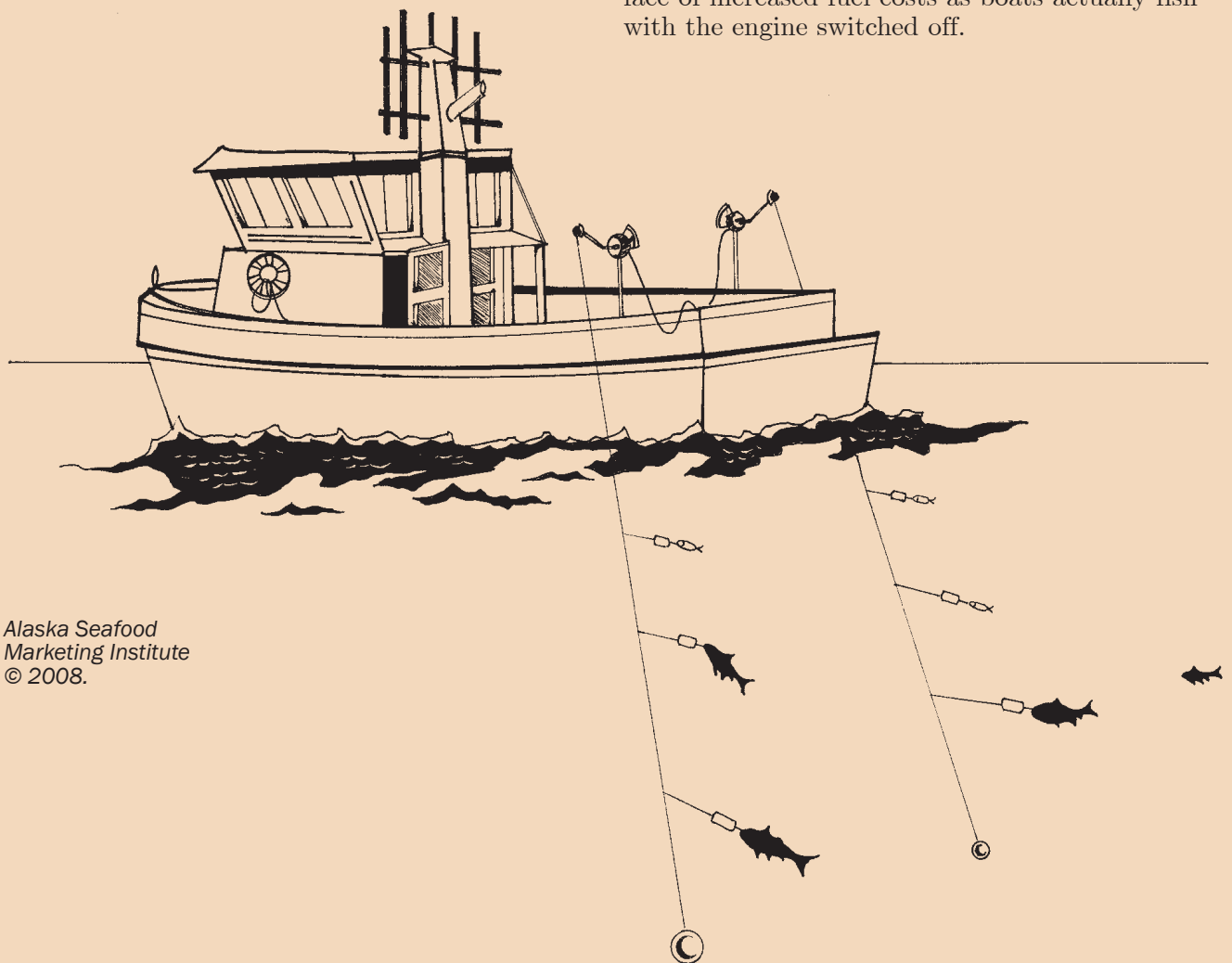
into fish sticks and similar products such as artificial king crab. Shrimp fishermen sort their catches by size and species and sell the product as either a whole frozen product, or as a headed frozen product.

Jig Fisher

Commercial jig fishing, also known as *automated handlining*, is a method of fishing using hooks with lures which are *jigged* up and down in the water. Jigs create a jerky, vertical motion, unlike spinnerbaits which move through the water horizontally. The jig is very versatile and can be used in both salt water as well as fresh water. Jig fishing techniques have been used for centuries by European vessels fishing Icelandic, Newfoundland and North Sea fishing grounds. Many of the techniques used then are still in use today.

In recent years however, the advent of hydraulic or electric automated jigging machines has eliminated much of the manual labor required to haul fish from great depths. Modern automated jigging machines are equipped with a computerized motor which enables the machine to automatically haul in the catch when a specified weight of fish is hooked. This improves the efficiency and accuracy of the fishing system, and also reduces bycatch and discards. You are effectively catching a quality fish straight from the sea.

Jig fishing is also extremely beneficial in the face of increased fuel costs as boats actually fish with the engine switched off.



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FIONA

Appendix

Commercial Fishing Seasons

Season lengths indicated in this summary are subject to closure by Emergency Order as guideline harvest objectives are met or as deemed necessary by conservation concerns. The areas listed in bold on the map below indicated the fishing areas. The species, seasons, and gear types are listed on the following pages.



Left: Seiner.
Photo courtesy of ASMI.



ARCTIC-YUKON-KUSKOKWIM

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Kuskokwim River												
coho								Gillnet				
chum						Gillnet						
Yukon River												
Chinook						Gillnet / Fishwheel						
summer chum						Gillnet / Fishwheel						
fall chum							Gillnet / Fishwheel					
Norton Sound												
Chinook						Gillnet						
coho								Gillnet				
pink							Gillnet					
chum						Gillnet						
Kotzebue Sound												
chum							Gillnet					
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Norton Sound												
sac roe					Gillnet	or Seine						
roe on kelp												
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Norton Sound												
red king crab	Pot							Pot				Pot

BRISTOL BAY/BERING SEA/ALEUTIAN ISLANDS

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook						Gillnet						
coho								Gillnet				
sockeye							Gillnet					
chum							Gillnet					
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
sac roe					Gillnet / Seine		Bait					
roe on kelp					Hand							
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/king crab	Pot											Pot
<i>bairdi</i> Tanner	Pot											Pot
<i>opilio</i> Tanner	Pot											Pot
blue king crab												
golden king crab	Pot		Pot							Pot		
GROUND FISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod												Pot / Jig

ALASKA PENINSULA

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
South Peninsula												
coho								Gillnet / Seine				
pink							Seine					
sockeye						Gillnet / Seine						
chum						Gillnet / Seine						
North Peninsula												
coho								Gillnet / Seine				
sockeye						Gillnet / Seine						
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
North/South Peninsula												
sac roe					Seine							
Dutch Harbor												
food/bait							Gillnet / Seine					
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Dungeness						Pot						
Tanner		Pot										
shrimp						Pot						
shrimp		Trawl				Trawl						
scallops		Dredge						Dredge				
GROUND FISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod			Pot									
cod			Jig									
rockfish					Pot							

CHIGNIK

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook						Purse Seine						
coho								Purse Seine				
pink							Purse Seine					
sockeye						Purse Seine						
chum							Purse Seine					
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
sac roe				Purse Seine								
GROUND FISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod			Pot									
cod			Jig									
rockfish			Jig									

KODIAK

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
coho								Seine / Gillnet				
pink							Seine / Gillnet					
sockeye						Seine / Gillnet						
chum							Seine / Gillnet					
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
food/bait		Trawl / Seine / Gillnet								Trawl / Seine / Gillnet		
sac roe				Seine / Gillnet								
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Dungeness								Pot				
Tanner		Pot										
shrimp		Trawl						Trawl				
scallops		Dredge						Dredge				
sea cucumber		Dive									Dive	
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod			Pot									
cod						Jig						
rockfish						Pot						

COOK INLET

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Upper Cook Inlet												
Chinook							Gillnet					
coho							Gillnet					
pink/chum							Gillnet					
sockeye						Gillnet						
Lower Cook Inlet												
pink							Gillnet / Seine					
sockeye					Gillnet / Seine							
chum							Gillnet / Seine					
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Upper Cook Inlet												
sac roe and food/bait				Gillnet								
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
clam						Shovel						
scallop								Dredge				
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod			Pot / Longline									
cod					State Waters Pot / Jig Fishery							
rockfish/lingcod							Jig					
sablefish							Pot / Longline					

PRINCE WILLIAM SOUND/COPPER RIVER

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook						Gillnet						
coho								Gillnet				
pink							Gillnet / Seine					
sockeye						Gillnet						
chum						Gillnet						
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
shrimp						Trawl					Trawl	
scallop							Dredge					
GROUND FISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Pacific cod						Longline / Pot (Pot and Jig only during State Waters Fishery)						
rockfish						Bycatch Fishery only (full retention required)						
pollock			Trawl									
sablefish						Longline / Pot / Trawl						
ling cod							Jig (all legal gear)					

YAKUTAT

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
coho								Set Gillnet				
sockeye						Set Gillnet						
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/blue king crab											Pot	
shrimp	Pot					Pot						
shrimp	Trawl					Otter Trawl						
scallop	Dredge					Dredge						

Tanner and Dungeness crab fisheries are closed until further notice.

SOUTHEAST ALASKA

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook	Winter Troll		Spring Troll		Summer Troll					Winter Troll		
coho							Seine / Gillnet / Troll					
pink						Seine						
sockeye						Seine / Gillnet						
chum						Seine / Gillnet / Troll						
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
food/bait	Seine									Seine		
sac roe				Seine / Gillnet								
roe on kelp				Pound								
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/blue king crab	Pot											Pot
golden king crab			Pot									
Dungeness	Pot (D1, D2, 13B)					Pot (most areas)					Pot (all)	Pot
Tanner			Pot									
shrimp	Beam Trawl							Beam Trawl				
shrimp	Pot						Pot			Pot		
geoducks						Dive						
red urchins						Dive						
sea cucumber	Dive										Dive	
GROUND FISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
rockfish	Longline											Longline
sablefish						Longline (NSE)		Longline or Pot				
lingcod								Dinglebar Gear				
cod						Longline						



Acronyms

ADF&G	Alaska Department of Fish and Game.
ASMI	Alaska Seafood Marketing Institute, a marketing organization with the mission of increasing the economic value of the Alaska seafood resource.
AFA	American Fisheries Act, the 1999 law rationalizing the Bering Sea pollock fishery.
BS/AI	Bering Sea/Aleutian Islands, a fisheries management area.
CDQ	Community Development Quota, an allocation of pollock, crab and other species given to Bering Sea coastal communities to promote local economic development.
CFEC	Commercial Fisheries Entry Commission, the state commission that manages the limited entry program.
DPS	Department of Public Safety, the state agency charged with providing functions relative to the protection of life, property and wildlife resources.
EEZ	Exclusive Economic Zone, federally managed waters from 3 to 200 miles offshore.
FRED	Fisheries Rehabilitation, Enhancement and Development Division of ADF&G which managed the state's salmon hatchery program.
GOA	Gulf of Alaska.
IFQ	Individual Fishery Quota, a catch allocation given to a participant and intended to end the race for fish. Also called ITQs for Individual Transferrable Quota, meaning the share can be bought and sold.
INPFC	International North Pacific Fisheries Commission, created by a treaty between the U.S., Canada and Japan, the International North Pacific Fisheries Commission regulated high seas fishing for salmon and other species from 1952 to 1992.
IPHC	International Pacific Halibut Commission, formed by a 1923 treaty between the U.S. and Canada, which manages halibut stocks in the North Pacific.
IUU	Illegal, Unregulated and Unreported fishery usually conducted on the high seas.
JV	Joint Venture fishery between a U.S. harvester and a foreign buyer and used as a transition to full Americanization of the groundfishery in the Bering Sea.
MSA	Magnuson-Stevens Act, the current name for the 1976 Fishery Conservation and Management Act and which regulates commercial fishing within the U.S. 200-mile limit.
NOAA	National Oceanic and Atmospheric Administration, the federal agency, part of the U.S. Department of Commerce and includes the National Marine Fisheries Service (NMFS).
NMFS	National Marine Fisheries Service, a federal agency dedicated to the stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems.
NPAFC	North Pacific Anadromous Fish Commission, the successor to the International North Pacific Fisheries Commission, created in 1992 by an agreement between the U.S., Canada, Japan, Russia and South Korea to promote the conservation of North Pacific salmon.
NPFMC	North Pacific Fishery Management Council, a regional council that manages fisheries within the federal 200-mile limit off Alaska.
USCG	United States Coast Guard is a military branch of the United States involved in maritime law, mariner assistance, and search and rescue, among other duties.

Glossary

Americanization	The process of transferring fisheries within the U.S. 200-mile limit (or EEZ) from foreign to domestic utilization.
Boldt Decision	The 1974 court case which affirmed the right of tribes in the state of Washington to harvest up to 50% of the salmon that return to the state. Alaska was not directly affected but this decision impacted fishing effort and salmon treaty negotiations.
Bycatch	The unintended harvest of a non-targeted species, such as salmon caught in a pollock trawl.
Crab Pots	Baited metal cages set along the seafloor to catch species such as King crab and cod.
Derby Fishery	A term for an open-access fishery in which an unlimited number of participants try to catch as many fish as they can in the shortest amount of time. Also called an “Olympic” fishery or the “race for fish.”
Donut Hole	An area of international waters enclosed by the 200-mile limits of bordering nations, such as in the central Bering Sea.
Driftnets	Gillnets that are set adrift in the water. Commonly used by salmon fishermen in state waters, the term “high seas driftnets” often describes fishing gear used to illegally target Alaska salmon in international waters.
Gillnets	A curtain of net extended in front of a run of fish like salmon that catches them by their gills.
Longlines	Strings of baited hooks anchored along the seafloor and used to catch species like halibut, sablefish and cod.
Purse Seines	Nets that encircle a school of fish such as salmon or herring and are then “pursed” or closed by the bottom.
Setnets	Gillnets that are anchored along the shoreline of a bay or river.
Trawl	A large net that is dragged through the water or along the seafloor and usually catches large volumes of relatively low value species like pollock, sole and rockfish.
Troll	Not to be confused with the similarly sounding trawl, trollers drag baited hooks through the water and target high value species like king and coho salmon.
Limited Entry	A limit on the number of participants in a fishery which, by itself, does not end the race for fish.
Harvesting Cooperative	An agreement in which harvesters divide the catch quota among themselves to avoid the race for fish but still compete against each other on the market.
Rationalization	A frequently used but rarely defined term that describes a combination of access limitation, IFQs, harvesting cooperatives and other measures to slow the race for fish to achieve economic and biological goals.

