

SEA CHANGE:

031

The Alaska Seafood Industry 1982

Alaska Fisheries Development Foundation, Inc.



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for
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preface

If there is one generalization that can be made about the Alaska seafood industry, it is that “Anything Can Happen.” Dynamic, often unpredictable change is the rule rather than the exception. When viewed from a unified and historical perspective, however, the diverse Alaska seafood business reveals patterns and trends that become ever more provocative as the industry matures. This report is an attempt to comprehend the industry as a whole in terms of developmental progress, and to speculate on the shape of the industry’s future.

The seafood industry of Alaska is actually a huge, international array of businesses, including fishermen, processors, investors, vessel designers, consultants, distributors, grocers, retailers, food companies, equipment manufacturers, advertisers, seafood technologists, packaging manufacturers, transportation firms, and many others. Progress and innovation come only from these individual profit-seeking entities. The intent of this publication is to provide insights regarding the context in which these businesses operate, in an effort to catalyze the creative activity that can, in hindsight, be recognized as industry development.

salmon

The dramatic restoration of Alaska's salmon runs over the past decade, and the resulting record commercial catches, exemplify the continued vitality of Alaska's marine realm. It reflects a period in which reproductive and ocean survival conditions have been vastly improved, and argues in favor of the efficacy of modern resource management. And, it has confronted the state's salmon industry with tremendous promise ... and a corresponding set of difficulties.

Alaska's commercial salmon harvest has climbed from record low to record high levels in the span of 10 years (Figure 1). From an average annual catch of 29 million fish in the 1972-1976 period, the Alaska harvest has more than tripled to an annual average of almost

100 million fish from 1978-1982. Biologists predict another whopping catch in 1983.

While the resource story has been one of almost unqualified success, however, the task of harvesting, processing and marketing these enormous quantities of salmon has created substantial levels of stress throughout the salmon industry. This stress, in turn, has been the mother of innovation.

The industry has been challenged by the largesse, and forced to look beyond canning, the traditional mode of preserving and marketing the catch. As shown in Figure 2, recent canned packs have not been much larger than those of the 1960's, when only about half as many fish were being caught. Selling 4-million-case packs would have strained the industry in the best of

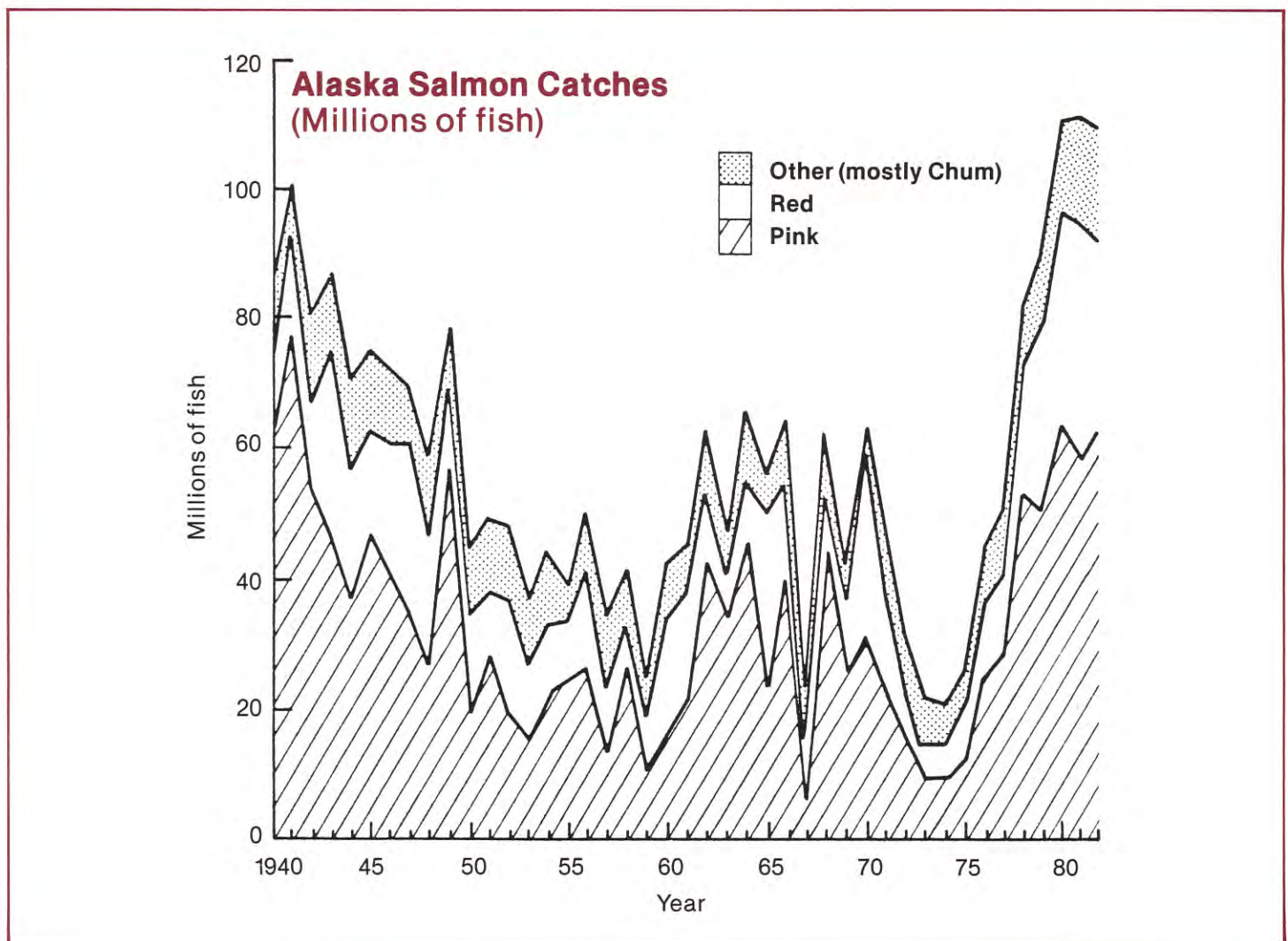


Figure 1. Alaska commercial salmon harvests with proportion accounted for by pinks and reds, 1940-1982.

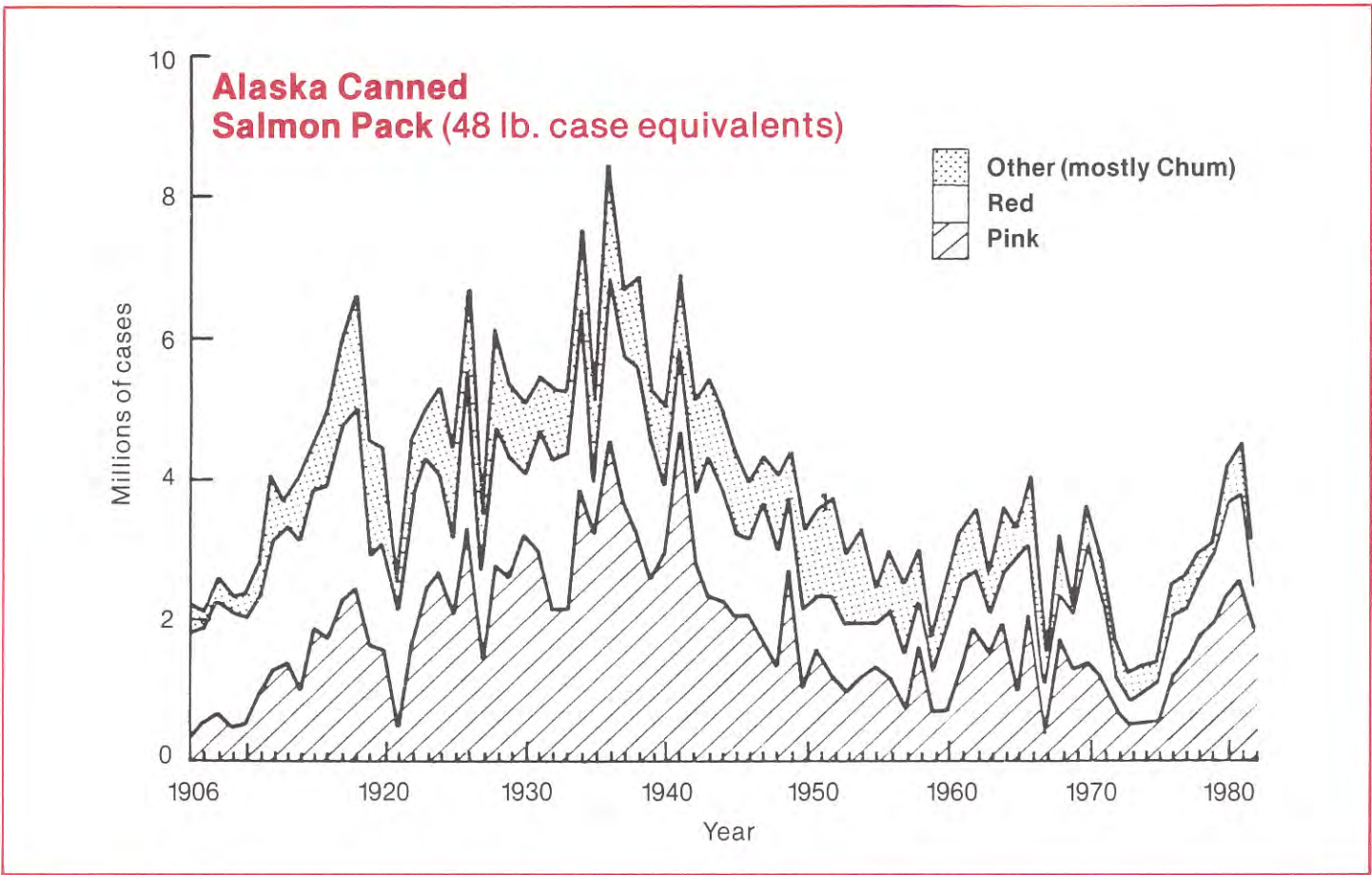


Figure 2. Alaska canned salmon pack with proportion accounted for by pinks and reds, 1906-1982.

times, but fate had another twist in store for the salmon canners. Just when the traditional marketing channels had been plugged and the industry was striving to create new demand for its canned fish, the botulism scare of 1982 severely depressed world prices and abruptly curtailed demand.

These circumstances fueled another trend that had been gathering strength within the Alaska salmon industry, the shift away from canning toward the production and marketing of fresh and frozen fish. These latter production modes provided a means of coping with renewed abundance, and of circumventing the turmoil that afflicted the canned market. Nineteen-eighty-two marked an historic turning point.

The 1982 catch, while not the all-time-record that had been predicted, was still enormous, but the canned pack fell from 4.4 million cases the prior year to 2.3 million. The drop in the production of valuable red salmon from western Alaska was even more precipitous: from 0.7 to 0.2 million cases.

Even prior to the botulism scare, the industry had been evolving in response to the impossibility of coping with larger catches by simply canning more fish. A combination of declining real prices, dropping per

capita consumption of the canned product and worldwide recession had stifled the product flow, produced costly inventories and reduced profits to both packers and fishermen.

A gradual shift toward fresh and frozen production had been the answer. Now, with a potential industry-wide crisis in the making, and with a record salmon return about to appear on the fishing grounds, there was strong impetus toward the new modes of operation. The industry looked toward new technologies, new facilities, new methods of distribution, and the creation of new markets for these alternative product forms. In 1982, for the first time in its history, the Alaska industry froze more salmon than it canned (Figure 3).

While the steady shift in operations has enabled the industry to diversify sufficiently to cope with the big harvest from a production standpoint, it has simultaneously placed a new premium on market development and left the industry with a crucial reliance upon export sales. The dramatic increase in frozen production has found markets primarily overseas, and in 1981 exports absorbed three-fourths of the frozen pack. And, as demonstrated in Figure 4, the

growing frozen sector of the industry currently has but one chief customer: Japan.

From 1980 to 1982, U.S. exports of frozen salmon, mostly of Alaska origin, more than doubled from 122 million pounds worth \$198 million, to 250 million pounds worth \$405 million. During that period, Japan's share of the purchase value grew from just over half to more than three-quarters of the total. The Japanese were the principal buyers of every species of frozen Alaska salmon in 1982, and took fully 98 percent, or 119 million pounds, of this country's exports of red salmon.

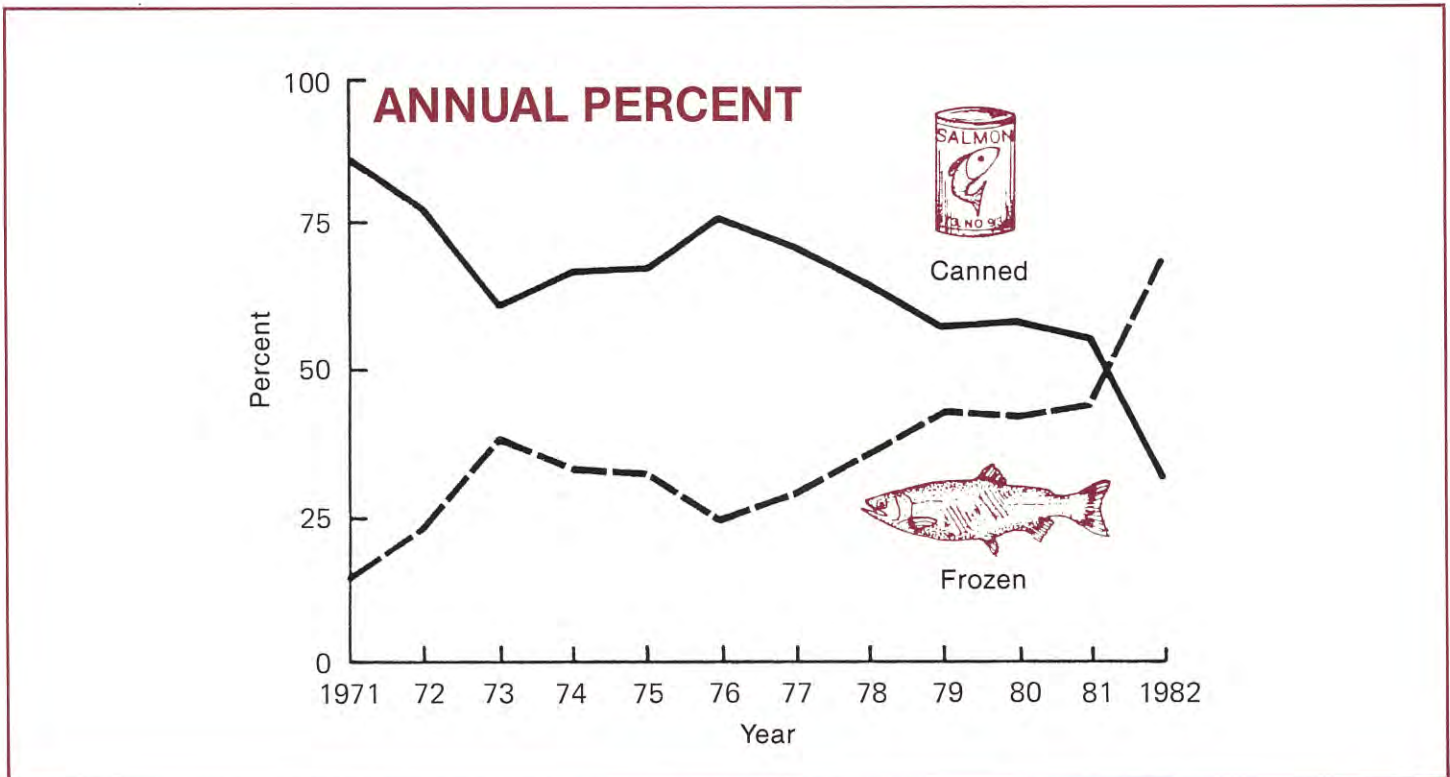
Another depiction of Japan's central role in the export trade is provided by Figure 5, which shows 1981 and 1982 overseas sales of canned and frozen salmon, and salmon roe. It demonstrates that while Japan buys virtually none of this country's canned pack, it absorbed nearly the entire population of roe each year, as well as an increasing portion of the frozen pack. Thus, in 1982, while the sales of both canned and frozen salmon to other countries fell, the importance of Japan as a customer grew. In quantitative terms, Japan's share of the purchase of *all* forms of U.S. salmon grew from 58 percent of the total in 1981, to 72 percent the following year.

In view of the vagaries of currencies, politics and trade restrictions within the export arena, however, the Alaska salmon industry is also driven by a crucial need to stimulate domestic demand for fresh and frozen

salmon products, a demand that had virtually disappeared in the post-war period due to price and lack of availability. Whole salmon, steaks, roasts, fillets and new products like salmon croquettes, patties, loaf and nuggets are meeting with growing acceptance by the American consumer, who has begun to rediscover this choice, increasingly visible, increasingly affordable form of protein from Alaska.

The emergence of stable markets based upon enhanced supplies of salmon is the hoped-for consequence of renewed abundance. The current experimentation with new market forms, and the development of entirely new products comprised all or partly of salmon, are particularly encouraging signs for the future because this type of production adds value within an industry that, outside of the canned sector, has typically relied upon the sale of product in the round.

This shift away from canning to freezing within the salmon industry is in conformance with what has already occurred in other sectors of the seafood industry and the food industry in general. Only time will tell, however, whether it represents a permanent change in the business of harvesting, processing and marketing salmon, or just a brief accommodation to unusually large supplies and slumping demand for canned products.



U.S. EXPORTS OF FROZEN SALMON

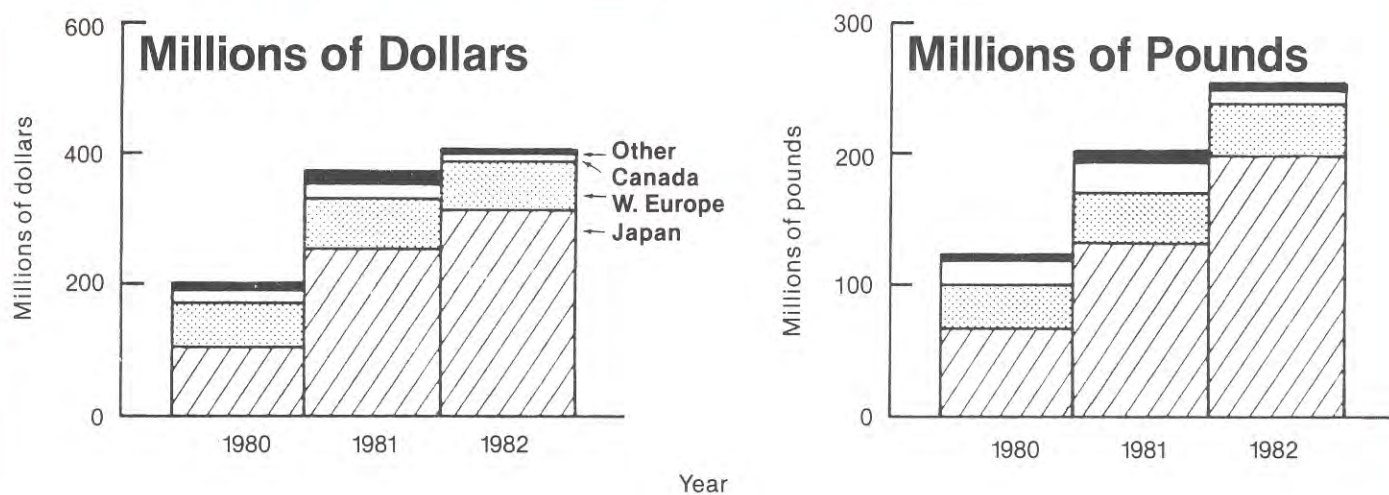


Figure 4. U.S. exports of frozen/fresh (primarily frozen) salmon by principal places of destination, 1980-1982.

1982 Fishery

Although the final catch figures are not in yet, the 1982 Alaska harvest of around 110 million fish was among the largest in history. It followed the record breaking 1981 catch of between 111 and 113 million fish, and would have been larger except for price negotiations that delayed fishing in some areas, primarily Bristol Bay and Prince William Sound. Prices received by fishermen were considerably lower than in 1981.

Catches of both red and pink salmon, the mainstays of the industry, fell below expectations in 1982. Most of the shortfall in reds occurred in Bristol Bay, where delays in fishing and a smaller than anticipated Kvichak River run produced a catch of only 15 million fish, compared to an anticipated harvest of 29 million. Smaller-than-expected catches of pinks in Bristol Bay, Kodiak, Cook Inlet and southern Southeastern districts produced most of the remaining discrepancy between the pre-season prediction and the reality of the fishing grounds.

On the brighter side, Alaska fishermen landed almost 6 million coho, about twice the expected catch. Other good news included record or near-record catches of pinks in the Cordova area (20.3 million fish), sockeye in upper Cook Inlet (3.0 million fish) and in the Kodiak district (1.2 million fish), and kings in Bristol Bay (0.25 million fish). An unusually large return of pink salmon went mostly unharvested in Norton Sound because of poor market conditions.

Outlook

Projections by the Alaska Department of Fish & Game (ADF&G) call for an Alaska salmon catch of around 95 million fish in 1983. Although this would represent a drop of some 15 million fish compared to 1982, it would still be large by historical standards.

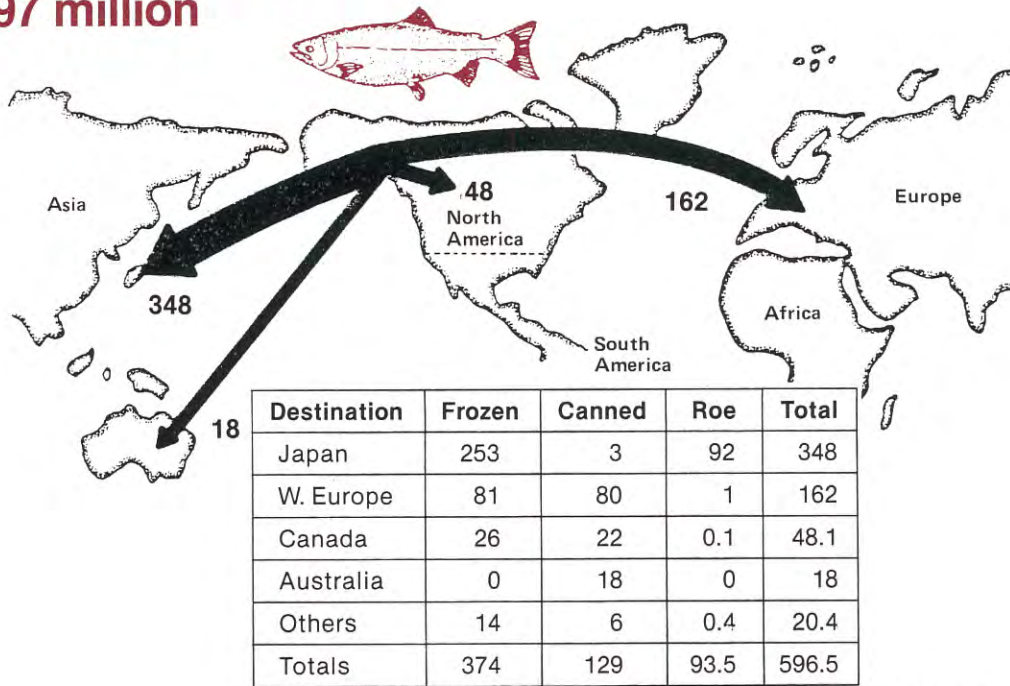
A smaller harvest of pink salmon is expected to account for over three-fourths of the catch reduction from 1982 levels, with fewer coho and chum accounting for the rest of the decline. The catch of red salmon is expected to exceed that of 1982, with predicted Bristol Bay landings of over 20 million fish, compared to 15 million last year.

The 1983 harvest is expected to be smaller in Southeastern and Central Alaska, but larger in Western Alaska. The greatest reduction should occur in Southeastern Alaska, according to the prediction, where around 9 million fewer pink salmon are expected to be caught. The drop in Central region is expected to result from smaller returns of red, chum and coho salmon. Almost all of the increase in Western Alaska should result from the larger harvest of Bristol Bay red salmon, the biologists conclude, and Bristol Bay should more than compensate for the smaller harvests that are expected for cohos and pinks.

Although the record of the biological predictions has improved with time, there is still considerable uncertainty associated with salmon forecasts. While a 1983 statewide harvest of 95 million fish is the best guess available, the forecasters carefully point out there

1981 SALMON EXPORTS

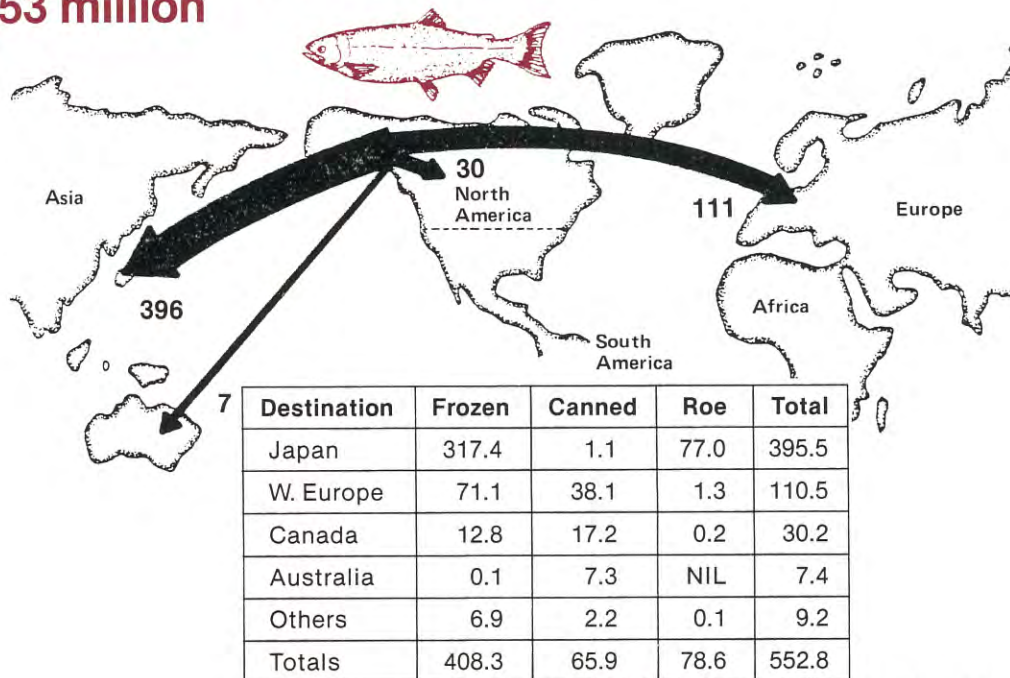
Total \$597 million



Figures represent millions of dollars.

1982 SALMON EXPORTS

Total \$553 million



Figures represent millions of dollars.

Figure 5. Value of 1981 and 1982 U.S. salmon exports by product type and destination.

is one chance in four that the actual harvest could fall *outside* of a broad range of 70 to 135 million fish. Specific forecasts for particular areas and runs are subject to even more uncertainty.

In 1982, for example, when the biologists appeared to come within 2.6 million fish of the actual harvest with their prediction of a 25.5-million-fish catch for all of Southeastern Alaska, their figures turned out to be too high by 9.4 million fish in the southern half of the region, and too low by 6.8 million fish in the northern part. And, actual 1982 returns (catch plus escapement) of valuable Bristol Bay red salmon were less than two-thirds of the projected returns.

The ability to accurately predict salmon runs is especially crucial to the Alaska fishing industry now, when the fisheries for king crab, Tanner crab and shrimp are severely depressed. This condition has left Alaska's fishermen and processors unusually dependent on salmon for their livelihoods. From a resource standpoint, only so-called bottomfish like cod and pollock appear to offer similar opportunities, at least for the next few years.

Salmon runs tend to be cyclical in nature. The recent, large Alaska catches have occurred at what can be viewed as a cyclical high, with history leading us to expect the resource pendulum to swing back toward a cyclical low in the years ahead. It seems unlikely, however, that future declines will be as severe as those of the past. Modern research has produced better understanding of the factors governing natural production, while resource managers have improved their ability to obtain desired escapements both in terms of the number and distribution of fish. Habitat rehabilitation projects have provided better access to spawning grounds, and private hatcheries have boosted the human contribution to salmon reproduction. The combination of all these factors should help alleviate any adverse impacts on Alaska's salmon stocks wrought by Mother Nature.

While catches may decline somewhat in the years immediately ahead, they should not drop to the disastrously low level that prevailed in the mid-1970's. Over the long term, it seems likely that Alaska salmon catches will be above historic levels because of the improved relationship between salmon and humans. This would provide a degree of stability that has been missing in the "boom or bust" character of the salmon industry as it has existed up to now.

crab

The rapid rise and even more sudden fall of the Alaska crab industry centered in the southeastern Bering Sea has comprised one of the most remarkable chapters in the history of commercial fishing on the North Pacific. After the glory years of the late 1970's and 1980, when those engaged in the production of Bering Sea king and Tanner crab grew accustomed to burgeoning growth and profits, the resource plunged in 1981. It was a stunning blow to the industry, generating waves of painful belt tightening and financial distress.

From a record high of over 300 million pounds of crab harvested in 1980, the statewide catch plummeted to 200 million pounds in 1981 and to just 124 million pounds in 1982 (Figure 1). The slump in the production of king crab was most severe. King crab was the most glamorous of the Alaskan crab products, and the one that had carried the industry to heights of success because of its appeal as an in-shell restaurant entree. From a record harvest of 185 million pounds in 1980, the state's production fell to just 39 million pounds in

the span of two years, while prices soared and king crab became a luxury item in a drastically reduced marketplace.

Tanner (or snow) crab production was little better; catches fell from an all-time high of 131 million pounds a year in 1978 and 1979 to just 69 million pounds in 1982. The supply shortage has sent the Alaska crab industry reeling. Little increase in the supply of either king or Tanner crab is expected for at least the next year or two.

The effects of the supply shortage quickly struck both fishermen and processors, and shock waves still resound throughout the industry. Smaller catches, reduced catch rates, and shorter seasons have left the fishing fleet awash in red ink, despite the unheard-of prices recently paid to fishermen for crab. A portion of the crab fleet—vessels large enough to be converted to mid-water trawling—have found employment in Alaska's growing joint venture fisheries for bottomfish. But this has not been a viable option for most skippers.

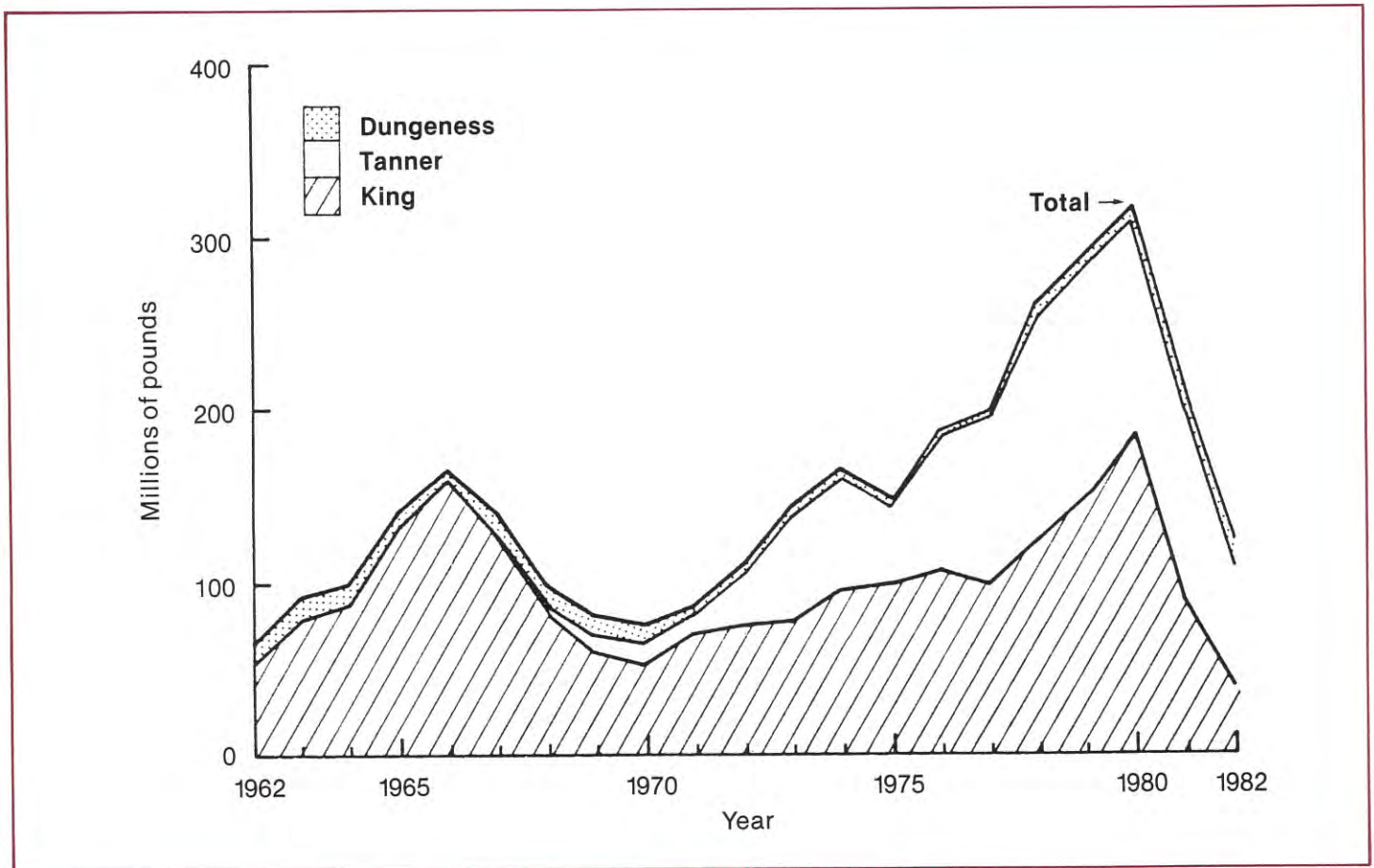


Figure 1. Alaska landings of king crab, Tanner crab and Dungeness crab, 1962-1982.

The rise in wholesale prices has sharply curtailed the size of the crab market, a turn unexpected by processors who paid record ex-vessel prices on the fishing grounds. The result was a greater level of inventory at the start of 1983 than was in cold storage the prior year, an unusual situation in a time of scarce supply.

Resistance to higher prices is apparently coming from both domestic and foreign customers. Both king and Tanner crab are “white tablecloth restaurant” items in the United States, and just as king crab gained its market niche as a substitute for more expensive lobster, it appears that restaurateurs are substituting other shellfish, or entirely different menu items, for suddenly more costly Alaska crab.

A direct substitute that has hurt the Alaska industry has been the *opilio* Tanner crab from eastern Canada that has been imported into this country in increasing quantities. The Canadian crab is one expression of the worldwide search underway for alternatives to suddenly scarce and expensive Alaska king and Tanner crab.

An alternative of Japanese origin that poses both a threat as well as a potential source of promise for the Alaska crab industry is the imitation king crab meat made from *kamaboko* (a Japanese fish paste product) that offers a taste and texture surprisingly like the real thing. The basic ingredient of this ersatz shellfish is Pacific pollock, which, after mincing and adding other ingredients (including a proportionally small amount of real crab), is extruded in a form that closely resembles sections of meat from crab legs.

World sales of this product have soared in the past few years, especially to the United States, Australia and western Europe. Exports by Japan are reported to have increased from about 1 million pounds in 1979 to over 20 million pounds in 1982, and the latter figure is equivalent to the yield that would be obtained from a live-weight catch of approximately 100 million pounds of king crab.

The United States has been the largest customer for this Japanese product, taking over 70 percent of its 1982 output.

With most of the free world's supply of Pacific pollock at Alaska's doorstep, along with a substantial portion of the world's supplies of king and Tanner crab, the state's fishing industry would appear to be well situated to capitalize on the growing worldwide market for *kamaboko*-type products formulated around these species. The development of new products and markets, which was so instrumental to the initial growth of the Alaska crab industry, may thus hold the key to its continued prosperity. And, such development could be one stimulus for the realization of the long-frustrated dream of an American harvesting-processing-marketing sequence founded upon Alaska's vast stocks of Pacific pollock.

The export values of Alaska king and Tanner crab have been differently affected by reduced supplies and

higher prices. Increased prices have not compensated for the large drop in the volume of king crab exports, which fell from 15.8 million pounds (primarily of frozen sections) in 1981 to just 5.1 million pounds in 1982. The result has been an almost three-fold drop from \$76.4 million to \$26.8 million in the value of king crab exports between 1980 and 1982 (Figure 2).

The fall in the volume of Tanner crab exports has been smaller, from 32.0 million pounds in 1981 to 22.2 million pounds in 1982. With higher prices, the value of Tanner crab exports increased from \$49.8 million in 1980 to \$63.3 million in 1982.

As shown in Figure 2, Japan is by far the largest foreign customer for both kinds of crab, but especially for the lower priced Tanner crab. Japan's reluctance to buy premium priced king crab in 1982 has meant that a greater share of the Alaska production has been sold in the United States, or held in cold storage. In contrast, Japan appears to have maintained, or perhaps even increased, its share of purchase of the 1982 Alaska production of Tanner crab. Whether Japan will continue to be as good a customer for Tanner crab in 1983 and beyond will be of great concern to the Alaska industry.

Status of Fisheries

Alaska's largest resources of both king and Tanner crab occur in the Westward Region that encompasses Kodiak, the Gulf of Alaska, the Aleutian Islands, and—richest of all—the Bering Sea. It is within this westward region that the industry has been most severely impacted by resource declines.

The state's crab industry began in the post-war era with the development of the king crab fishery, then the exploitation of Tanner crab following in king crab's wake. The sequence of development for both types of crab began around Kodiak and spread westward. Development of the Bering Sea fisheries has been a fairly recent event, mostly occurring after 1970 for king crab and after 1975 for Tanner crab.

The pattern of development of the king crab fishery has entailed similar, cyclical patterns in each of the westward areas, but the concentrations of effort have occurred at different times (Figure 3). After peaking at almost 100 million pounds in the mid-1960's, catches in the Kodiak area quickly fell to 11 million pounds by the early 1970's and have never again approached anywhere near their former levels. The catch of 8.7 million pounds of red king crab in Kodiak's recently completed 1982-1983 season was the smallest since the development period of the fishery in the 1950's.

The history of the south Alaska Peninsula, Chignik and Aleutian red king crab fisheries has closely resembled that of Kodiak. The combined catches from these westward grounds peaked at 61 million pounds during the 1966-1977 season. Since the mid-1970's, catches have fallen within a much smaller range of 5 to 25 million pounds. The only bright spot in this area has

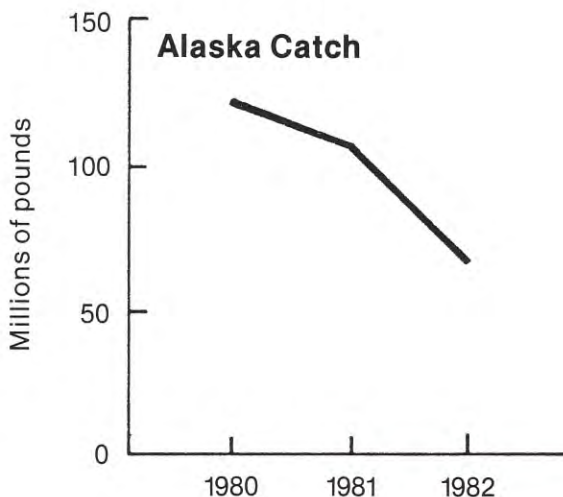
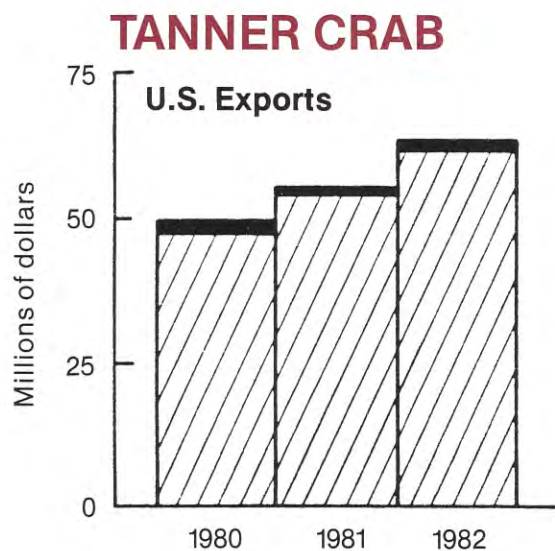
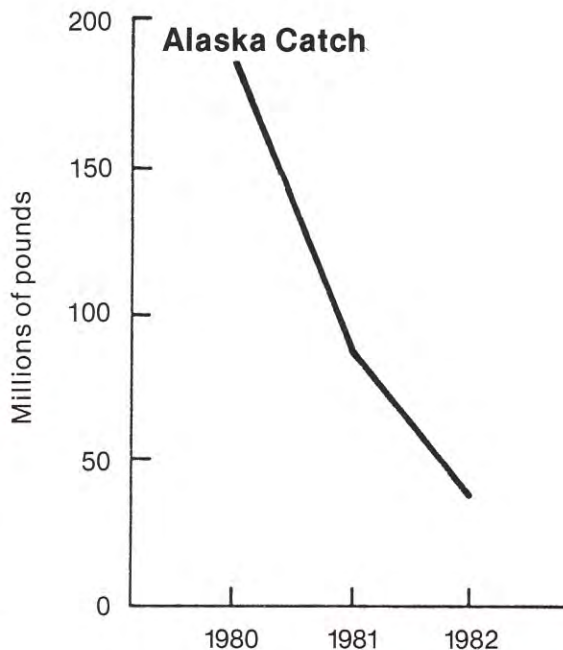
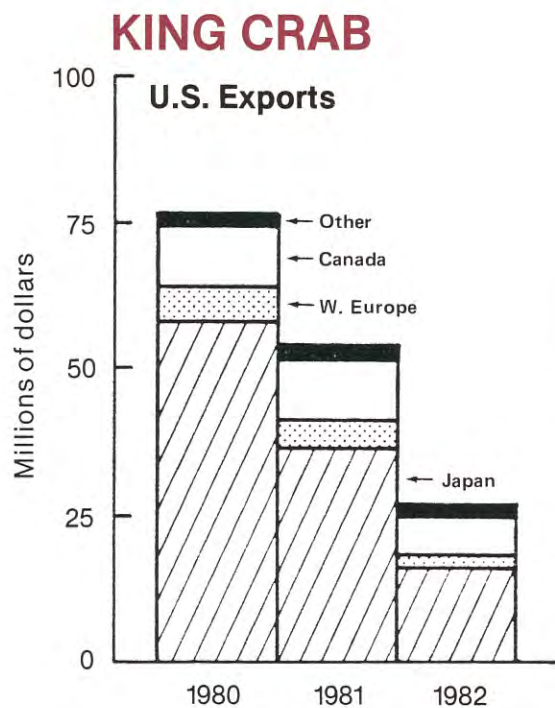


Figure 2. Value (millions of dollars) of U.S. exports of king crab and Tanner crab compared with Alaska catch (millions of pounds), 1980-1982.

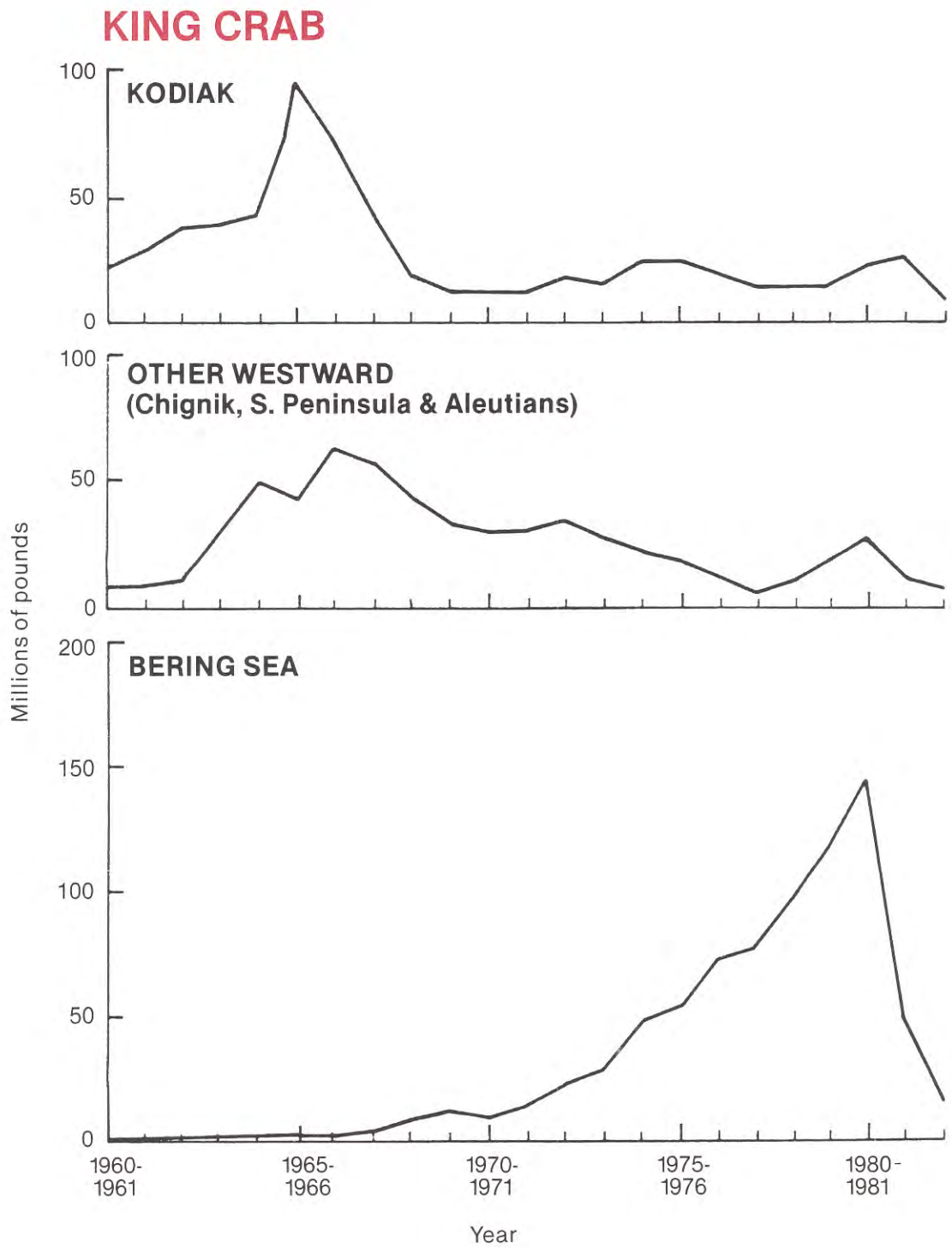


Figure 3. Catches of king crab from Alaska's westward region, 1960/61 season through 1982/83 season.

TANNER CRAB

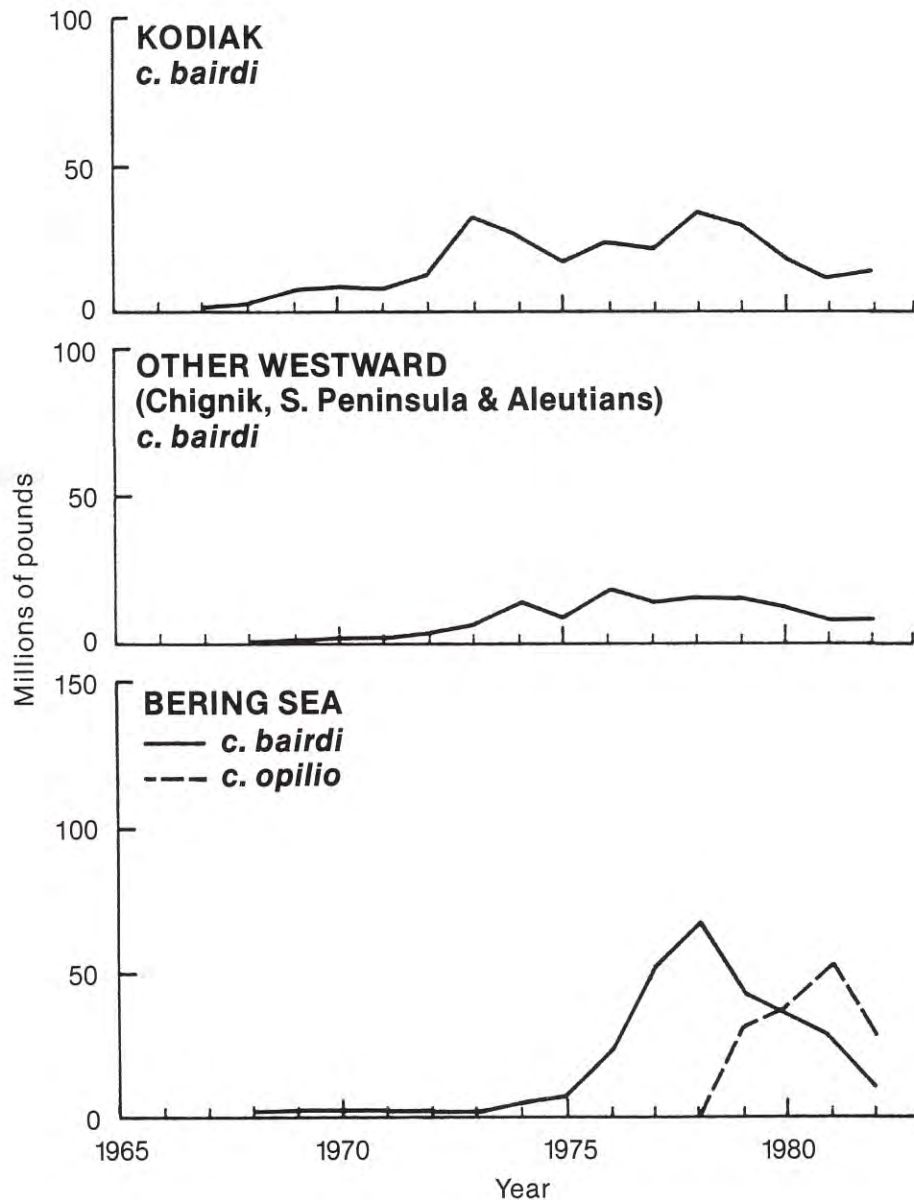


Figure 4. Catches of Tanner crab from Alaska's westward region, 1965-1982.

been a recent growth in catches of brown king crab from Aleutian Island grounds.

The rise and fall in Bering Sea harvests of king crab has been even more pronounced than in the other westward areas. Catches of Bering Sea king crab grew from less than 10 million pounds annually in the late 1960's to an all-time high of 144 million pounds during the 1980-1981 season.

Then, a sudden sharp and unexplained plunge in

resource abundance occurred, and the catch fell to 17 million pounds by the end of the recently completed 1982-1983 season. The drop was sharpest for the important Bristol Bay red king crab stocks that yielded a 1982-1983 season catch of only 3.0 million pounds, just 10 percent of the previous season's 30-million-pound catch.

Blue king crab comprised the bulk of 1982-1983 Bering Sea production. This species yielded a catch of

around 13 million pounds, with two-thirds of the production coming from the previously little exploited St. Matthew Island grounds of the northern Bering Sea district.

The evolution of the Tanner crab fisheries of Alaska's westward region is shown in Figure 4. The largest production has come from the Bering Sea where catches of *bairdi* Tanner crab have been supplemented by more recent harvests of the smaller *opilio* Tanner crab. While *bairdi* catches are down in the Kodiak and other westward areas, the drop in production of both *bairdi* and *opilio* in the Bering Sea has been most severe. The combined Bering Sea harvest of *bairdi* and *opilio* peaked in 1981 at 82 million pounds, then fell to 40 million pounds in 1982.

Outlook

The depressed status of most major stocks is expected to result in a continued short supply of both king crab and Tanner crab for at least the next few years. The problem is critical for red king crab stocks in Bristol Bay and the Kodiak area where recent surveys have shown sharply reduced numbers of legal-sized males (postrecruits) to support the present fishery and fewer small crabs (prerecruits) to sustain the fishery in years ahead.

Preliminary harvest guidelines set by Alaska Department of Fish & Game researchers in March, 1983, were for a 1983-1984 catch of 20 to 44 million pounds for all species of king crab in the westward region. That represents only about half the 45 to 84 million pounds that was forecast for the 1982-1983 season. The only expected increase is for the St. Matthew Island stock of blue king crab.

Aside from possible increases in the production of brown king crab, it seems likely that king crab harvests in Alaska's westward region will not improve much until after the mid-1980's.

Although the general status of most Tanner crab stocks is also poor, they appear to be in better shape than their larger relation, the king crab. There are signs of recovery of *bairdi* Tanner crab on the important Kodiak and Bering Sea grounds, and the St. Matthew Island stock of *opilio* Tanner crab appears to be in good condition. Based on these encouraging signs, there is reason to expect some resurgence in the westward region harvest of Tanner crab as early as 1984.

Aside from a recovery in the traditionally exploited stocks of king and Tanner crab, the best hope for raising future production is by utilizing smaller *opilio* Tanner crab and by increasing the harvest of brown king crab. At present, the marketplace demands that *opilio* measure at least 4¼ inches across the carapace. If *opilio* as small as 3.1 inches, the minimum size established by the State of Alaska, could be profitably utilized, it is likely that catches of this species could be at least doubled. There are indications that the industry is looking towards new kinds of product types that would

permit the use of smaller *opilio* crab, perhaps as early as 1984.

The search for new crab resources has already resulted in an increase in the harvest of brown king crab from the westward region. Substantial catches have occurred primarily in the central Aleutians in the Adak area, and secondarily from the Dutch Harbor district of the eastern Aleutians, where fishermen are for the first time targeting on this species.

Not much is known about the life history, stock composition, or potential yields of brown king crab. They are a deeper-water species (depths to 500 fathoms) than the red and blue varieties, which are caught generally at depths of 100 fathoms or less. Coupled with strong tides, the deep waters where brown king crab are being fished in the Aleutians make it difficult to use conventional king crab gear. New or modified fishing methods may be the answer to the profitable use of this resource. Some investigators believe that brown king crab may be able to provide yearly catches of some 20 million pounds. That level of production would greatly help the Alaska crab industry during the present period of reduced supplies of the traditional red and blue king crab species.

shrimp

“Where did all the shrimp go? ... no joy at all ... disastrous ... as good as dead ... the end of an era.” Those and other bleak words are being used to describe Alaska’s once great shrimp industry, which in the past few years, has been confronted with catastrophic resource declines. Between 1976 and 1982, annual statewide shrimp landings fell from a record 129 million pounds to just 17 million. The sharpest drop in production has occurred within the past two years, shattering any hope that this boom and bust fishery had bottomed out and was beginning to rebound.

Although five species of the genus *Pandalus*, the so-called pandalid or northern cold water shrimps, are commercially harvested in Alaska, the small pink shrimp (*Pandalus borealis*) has provided most of the production. The largest populations of pink shrimp occur around Kodiak and as far west as the eastern Aleutians in Alaska’s westward region. The 1982 westward region catch of only 11 million pounds was the smallest since 1964 when the fishery was developing, and 98 million pounds below the average that prevailed during the bumper years of 1973-1977.

Coping with such a drastic drop in shrimp supplies while the abundance of king crab and Tanner crab has also been falling has been a real challenge to the shellfish industry in the westward region.

A closer look at the shrimp production in particular areas within the westward region provides no reason to expect quick turnaround in abundance. As shown in Figure 1, shrimp landings have fallen precipitously in each of the areas, with the sharpest drops occurring in the most recent years. The gravity of the situation is best illustrated in the Chignik and South Peninsula districts of the Alaska Peninsula area. Although the fishery developed later in these districts than around Kodiak, and thus has impacted the resource for a shorter period, the stocks have experienced some of the sharpest declines anywhere.

After being closed in 1980 and 1981, some of the formerly important South Peninsula grounds were open to fishing in 1982, but no catches were reported. Production in the Chignik district plunged from almost 13 million pounds in 1980 to only 71,000 pounds in 1981, and to nothing in 1982.

The growing scarcity of pink shrimp corresponds with apparently similar developments in Cook Inlet. Cook Inlet catches were cut in half between 1981 and 1982 as the result of a sharp drop in stock size, a drop that appears to have occurred on unfished as well as on fished grounds. This is particularly ominous because of Cook Inlet’s reputation for long having provided stable production of 4 to 7 million pounds per year, even when fisheries to the west were being severely curtailed.

The failure of shrimp populations almost everywhere in Alaska to respond to closures and other restrictions on fishing has served to highlight the importance of nature in determining stock size. Both fishermen and researchers have been impressed by an apparent buildup in populations of predatory cod and pollock that has coincided on some grounds with a great reduction in the number of both small and large shrimp. In addition, biologists see a strong correlation between the decline in the Kodiak shrimp stocks and the increase in ocean temperatures in the northeast Pacific in recent years.

While there is agreement on the primary importance of nature, there is strong disagreement over how to manage the depressed shrimp stocks and fisheries—or whether to manage them at all. In recognition of this disagreement, the State of Alaska has established experimental fisheries in some areas where catches are unregulated except for a short fishing closure during the spawning season. For most areas, however, the state follows a conservative management policy that reduces harvest rates as the “health” of a stock deteriorates, and permits no fishing on severely depressed stocks. While this policy causes some immediate economic loss in the form of smaller harvests, it lowers the risk of the total resource failures that could occur if brood stocks of shrimp are reduced below viable levels.

While Alaska’s shrimp industry is faced with a resource crisis, matters are little better elsewhere along the West Coast. As shown in Figure 2, the combined shrimp landings in the other Pacific states and British Columbia have also fallen, although later and less abruptly than in Alaska. The greatest decline has occurred in Oregon and Washington, although those two states and Alaska still accounted for almost 90 percent of the 1982 West Coast production.

Alaska’s share of coastwide shrimp production has fallen from almost three-fourths of the total in 1976 to a little over one-third in 1982. Landings in Oregon and Washington since 1981 have exceeded those in Alaska, an unprecedented event for the modern fishery.

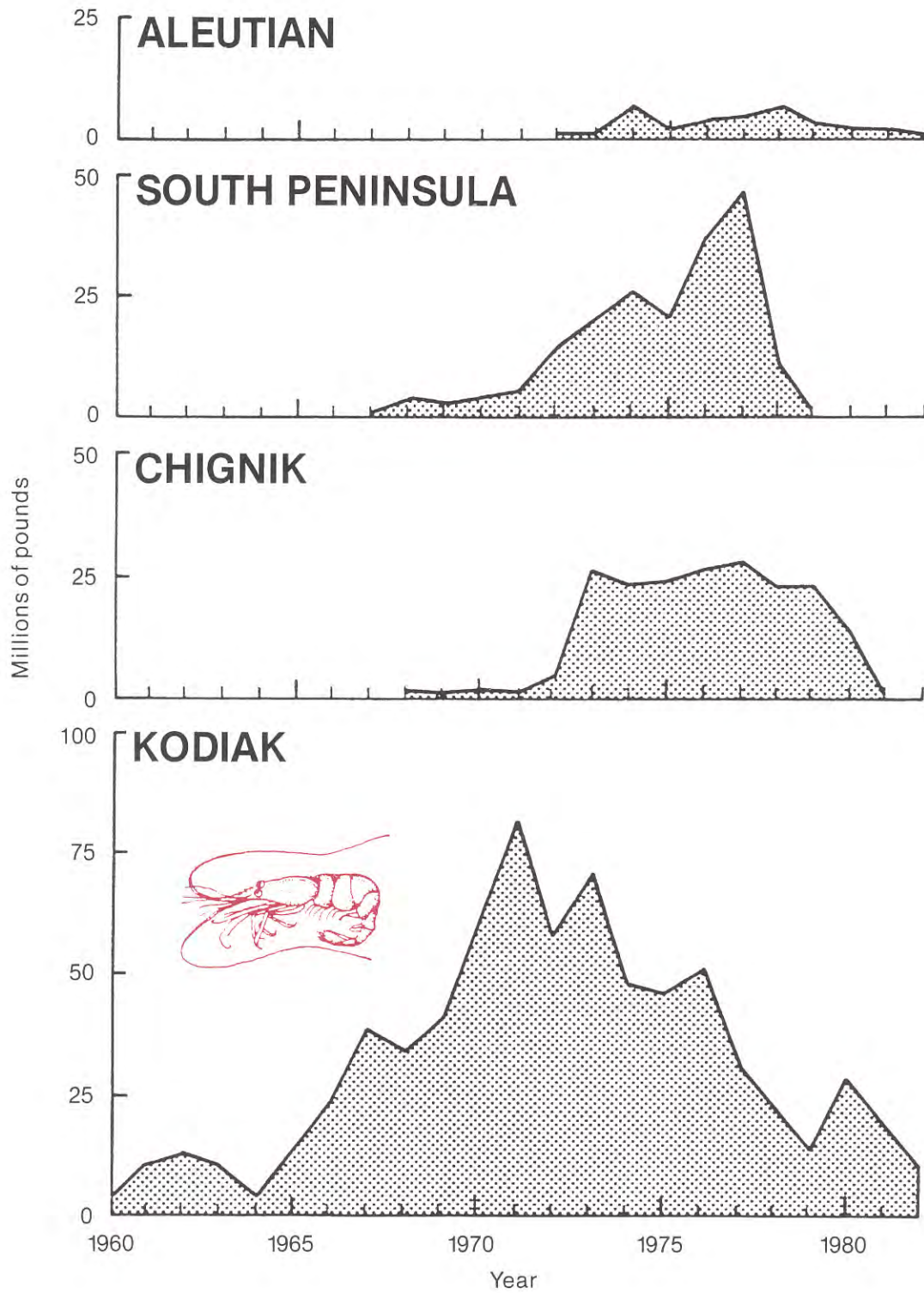


Figure 1. Catches of shrimp from Alaska's westward region, 1960-1982.

Markets

Unlike salmon, king crab, Tanner crab and herring, for which overseas sales account for a very important part of the Alaska production, the United States is the primary market for Alaska shrimp as well as for pandalid shrimp landed in the other Pacific states. Americans consume over 500 million pounds of shrimp a year, making this small crustacean the most valuable seafood product sold in the country.

About half of the United States supply is obtained from domestic landings and half from imports. Though most of the domestic production consists of tropical shrimp from Gulf of Mexico and South Atlantic states, during the 1970's when West Coast landings of cold water pandalid shrimp peaked between 100 and 200 million pounds (heads on) annually, the pandalids accounted for around one-third of the domestic shrimp production, with most of the pandalid production coming from Alaska.

Declining landings in Alaska and the other Pacific states have caused domestic users to look to overseas suppliers for shrimp. This has not only resulted in larger imports of pandalid shrimp from Norway, but in the use of other species as substitutes for pandalids, particularly shrimp from India and Asian countries.

While prices for most shrimp products climbed in 1982 because of a lower than normal United States supply, the prices for West Coast pandalid shrimp products increased very little. This unusual situation seemed to result from the smaller than customary pink shrimp that were landed in the West Coast fishery, and from the availability of satisfactory substitutes including other kinds of seafood.

Outlook

The next few years will be pivotal for the Alaska shrimp industry. Unless an unexpected upturn occurs in the abundance of shrimp, both fishermen and

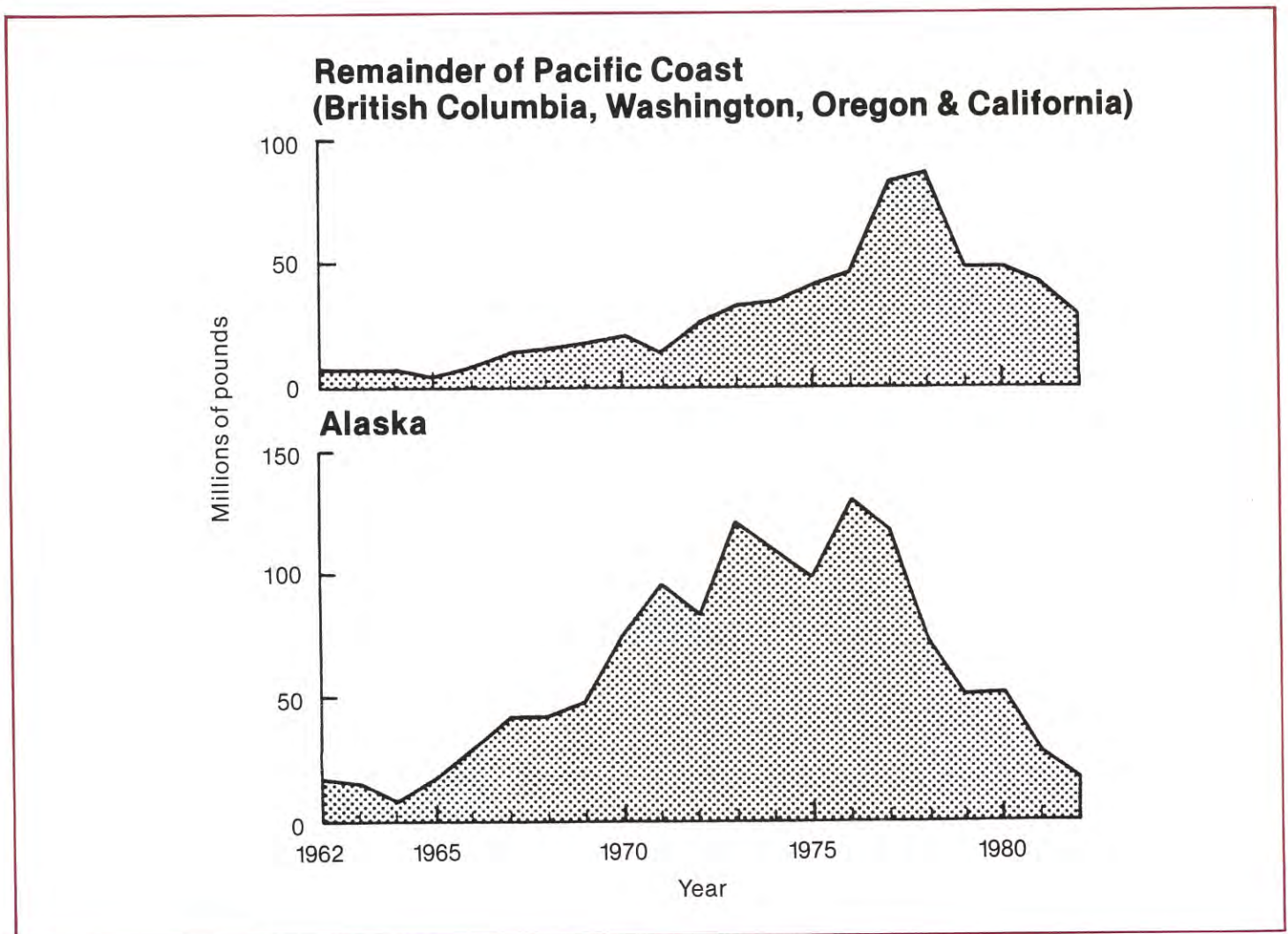


Figure 2. Comparison of Alaska landings of shrimp with those elsewhere on the Pacific coast, 1962-1982.

processors can look forward to continued hard times. As in the case of king crab, established outlets will be forced to drop Alaska shrimp when supplies are short, and it will require a major marketing effort to recapture those markets when production returns to historic levels.

There is a nagging suspicion that the fluctuating abundance of pink shrimp in Alaska, and elsewhere along the West Coast, may be only loosely related, or perhaps unrelated, to the size of annual harvests. If this is true, only nature and perhaps the reduction of predatory cod and pollock stocks through greater fishing pressure will cause a rebuilding of the shrimp resource. In the meantime, some western Alaska fishermen are rerigging their vessels to cash in on what they hope is a new bottomfish era.

pacific herring

True to form, the 1982 and 1983 herring seasons generated intense effort and the usual mixed bag of run sizes relative to forecasts, fishing successes and roe yields. They also produced varying financial returns to fishermen and processors.

Overall, however, the 1982 Alaska herring fisheries were quite productive (Figure 1). The state-wide landings were the highest since the late 1940's, when herring was used primarily for reduction to meal and oil. Landings in 1982 exceeded 104 million pounds, about a 12-million-pound increase over 1981 landings and the sixth year of increased state-wide harvests. Furthermore, 1982 was the first year in a generation that Alaska herring catches (by preliminary reports) exceeded the 100-million-pound mark.

Prices in 1982 were generally less than projected in

many areas. This was particularly true in the Western district's large-volume Togiak fishery, of the Bristol Bay region, and in the more northerly Arctic-Yukon-Kuskokwim region.

Prices in 1983 were generally higher than in 1982, but this year's volume of roe herring in the state's second-leading Prince William Sound region was much less than forecast and yielded only half the 1982 catch. Conversely, 1983 catches of roe herring from Togiak and more northern grounds broke production records. In total, it now seems likely that the 1983 Alaska herring catch will exceed 1982's record production.

Table 1 provides a detailed update for 1982 of Alaska's regional herring catches relative to those for 1980 and 1981. As in past years, the more lucrative roe herring fisheries accounted for about 85 percent of the

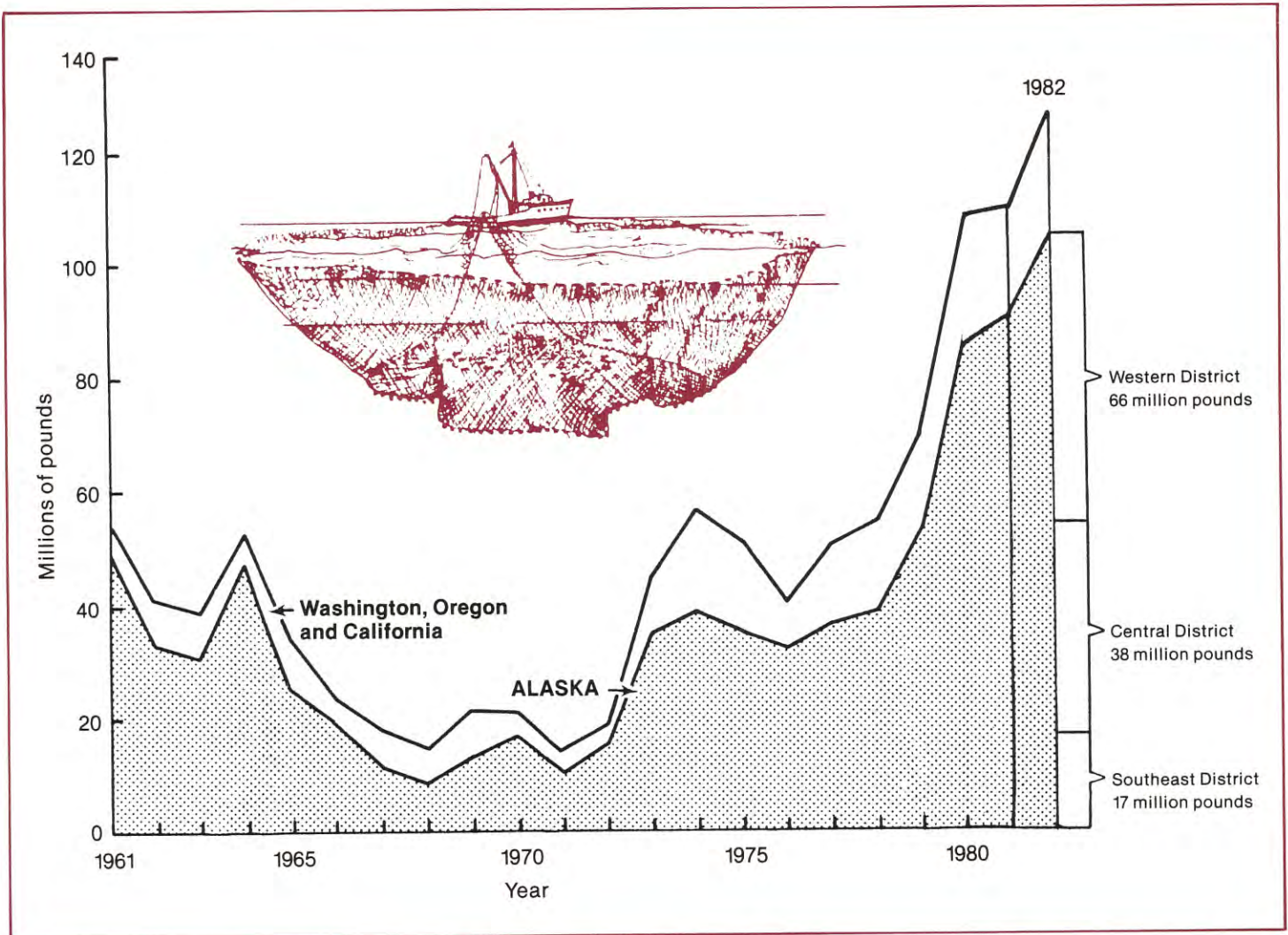


Figure 1. Proportion of the total U.S. landings of Pacific herring made in the State of Alaska, 1961-1982. Landings in 1982 indicate their origin by District.

DISTRICT REGION/YEAR	ROE HERRING	ROE ON KELP	FOOD AND BAIT	TOTAL
Southeastern District				
1980	12,916,000	0	5,400,000	18,316,000
1981	13,480,000	0	3,000,000	16,480,000
1982	14,424,000	0	3,054,000	17,478,000
Central District				
Prince William Sound				
1980	12,612,000	611,000	3,108,000	16,431,426
1981	28,088,000	121,033	0	29,209,033
1982	14,630,000	352,000	0	14,982,000
Cook Inlet				
1980	208,000	0	64,000	272,000
1981	442,000	0	0	442,000
1982	240,000	160,000	0	400,000
Kodiak				
1980	4,768,600	0	0	4,768,600
1981	4,126,000	0	0	4,126,000
1982	3,520,000	0	0	3,520,000
Chignik				
1980	1,388,000	0	0	1,388,000
1981	894,000	0	0	894,000
1982	392,800	0	0	392,800
Alaska Peninsula				
1980	906,000	0	0	906,000
1981	1,682,000	0	1,408,000	3,090,000
1982	1,470,000	0	8,260,000	9,730,000*
Western District				
Bristol Bay				
1980	33,206,000	189,662	5,986,000	39,381,662
1981	25,076,000	378,207	25,100	25,479,307
1982	43,200,000	235,000	2,790,000	46,225,000
Arctic-Yukon-Kuskokwim				
1980	8,062,067	48,840	270,213	8,381,120
1981	13,292,000	88,184	46,800	13,426,984
1982	12,080,000	77,000	0	12,157,000
ALASKA TOTAL				
1980	74,066,667	849,925	14,928,213	89,844,805
1981	87,080,000	587,424	4,479,900	92,147,324
1982	89,956,800	824,000	14,104,000	104,884,800

*Various reportings of Alaska Peninsula area are in conflict. Our best appraisal is that about 8 million pounds of this catch actually stemmed from a late summer seine fishery for food and bait herring in the eastern Aleutian Islands.

Table 1. Alaska's regional herring landings, 1980-1982.

total catch. Food and bait fisheries represented over 14 million pounds or about 13 percent of the 1982 harvest. About 7 million pounds, or half of the state's 1982 food and bait catch, stemmed from a August 5-September 1 fishery by seven purse seine vessels operating around Dutch Harbor in the eastern Aleutian Islands.

While this fishery represents something of a revival of a late 1920's and 1930's herring fishery for the Dutch Harbor fishermen, its sudden return to fame has caused headaches for Alaska Department of Fish & Game managers, and concern among herring fishermen in the Togiak region. The concerns stem from a recent analysis of scales from herring caught in the Dutch Harbor area, which suggest that they migrated there during the summer after being subjected to the Togiak roe fishery. This apparent "double dipping" of herring may precipitate a reduction or even an end to the revived food and bait fishery around Dutch Harbor.

Another major feature of the various 1982 herring fisheries was the substantial decline in Prince William Sound, from 28.1 million pounds in 1981 to about 14.6 million in 1982. This decline was more than offset by increases in the Bristol Bay fishery near Togiak, which increased from 25.1 million pounds in 1981 to 43.2 million in 1982.

Prices for 1982 and 1983 roe herring catches from the Pacific coast, including British Columbia and Alaska, are noted in Table 2. The key difference between 1982 and 1983 is measured in dollars, with prices in 1983 substantially higher than those of 1982. Higher prices at the beginning of this year's progression of herring fisheries was initiated in the San Francisco Bay fishery due to the arrival of Korean buyers who competed with the Japanese, traditionally the sole market participants.

Prices for some gillnet-caught fish in the 1983 coastal Bering Sea fisheries were also higher than in 1982, due to a provision which allowed direct deliveries to Japanese buyers inside state waters. Normally, fishermen sell their catches to U.S. buyers who are required to process the herring (primarily a matter of freezing whole and boxing) before it is transported out of state.

Virtually all Alaska roe herring is shipped to Japanese markets via Japanese freezer ships.

Fishing, tendering and processing efforts in the more productive fishing grounds were impressive in 1982 and 1983. For example, a two-hour opening in the 1982 Prince William Sound fishery yielded about 14 million pounds to 100 purse seiners. The 1982 Togiak fishery scooped up about 43 million pounds of herring in 96 hours through the efforts of about 200 gillnetters, 135 purse seiners, 70 tenders and about 30 floating processors.

In addition to the controversies generated over the Dutch Harbor food and bait fishery in 1982, the significant use of Japanese buyers in 1983, and the friction between gillnetters and purse seiners, there is pressure to permit a U.S. offshore herring trawl fishery during the winter in the Bering Sea. Foreign trawlers operated in these waters for at least 20 years prior to their phase out under FCMA regulations in 1979. Foreign trawler catches reached over 300 million pounds in the late 1960's.

Further discussions by fishermen and managers alike can be expected in 1983 as to the pros and cons of an offshore trawl fishery for food. This forecast calls for more controversy on the question of how Alaska's herring should be utilized.

REGION	OPENING DATE	CATCH MILLION POUNDS	EX-VESSEL TYPICAL PRICE PER METRIC TON
San Francisco	December 1981	19.2	\$ 600- 800
British Columbia	March 5, 1982	60.2	1,100
Southeast, Alaska	March 26, 1982	16.2	550
Prince William Sound	April 23, 1982	14.5	700
Kodiak	April 15, 1982	3.5	550
Togiak	May 14, 1982	47.5	300- 400
Security Cove	May 24, 1982	1.6	300- 400
Good News Bay	May 25, 1982	1.0	300- 400
Cape Romanoff	June 3, 1982	1.3	300- 400
Norton Sound	June 3, 1982	7.9	300
San Francisco	December 1982	22.0	1,150-1,200
British Columbia	March 1983	79.3	1,000
Southeast, Alaska	March 21, 1983	19.8	800- 900
Prince William Sound	April 1983	5.4	650-1,000
Kodiak	April 1983	3.7	650- 950
Togiak	May 3, 1983	53.0	425

Table 2. Opening dates, catch and typical prices for roe herring in Pacific west coast and Alaska herring fisheries. Prices are based on 10 percent roe herring. Data for 1983 are preliminary and are largely from industry sources.

pacific halibut

Although the Pacific halibut industry is blessed by a resource that is biologically much more stable than salmon and crab, the halibut industry is now beset by change and by some painfully difficult decisions. In recent years, the industry has been largely reshaped. The size of the coastwide resource is greatly diminished by historical standards, even though there have been encouraging gains in resource abundance in Alaska waters during the 1980's.

If the Alaska halibut picture has been getting somewhat brighter from a biological standpoint, however, the state's halibut industry is mired in socio-economic chaos because of the enormous growth that has occurred in the size and power of the fleet. It is growth that has been intensified, ironically enough, by a mechanism designed to have the opposite effect: limited entry.

As entry limitations have been imposed on other fisheries throughout the state, halibut, one of the last to

remain open, has received an influx of those disenfranchised elsewhere, especially in view of rising halibut prices. And, with a decision now pending on whether to adopt a moratorium on new entrants into the Alaska halibut fishery itself as a means of constraining the buildup, even more fishermen appear to have entered the halibut fray to ensure that they will have a track record if the moratorium is imposed. The consequences have been fishing seasons so short that a skipper who suffers a mechanical breakdown or catches the flu is likely to miss the entire event, and a marketplace that briefly feels a glut of halibut, then nearly a year-long scarcity.

For all their problems, however, the Alaskans engaged in the halibut fishery are better off than their counterparts to the south. The Pacific halibut fishery was jointly developed by American and Canadian setline fishermen, who traditionally were free to set their gear and market their catches wherever the bite

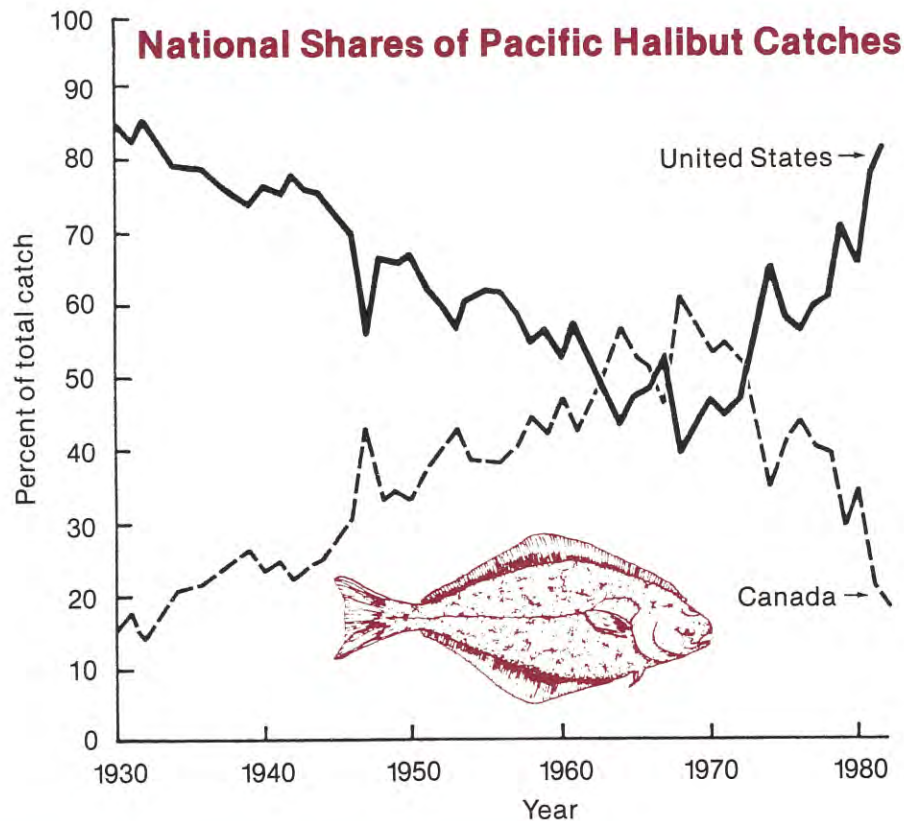
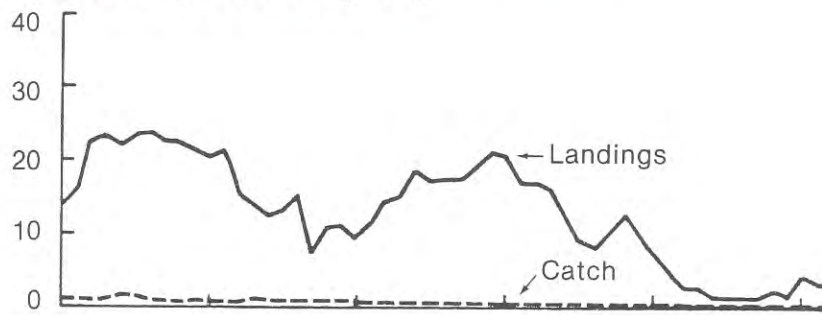
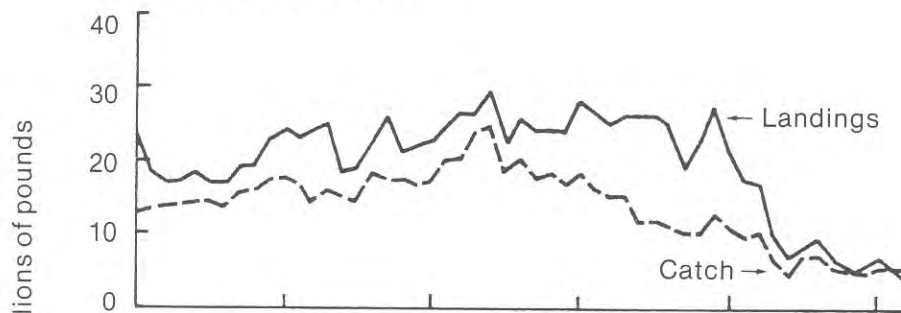


Figure 1. United States' versus Canada's share of Pacific halibut catch, 1930-1982.

Washington, Oregon & California (mostly Washington)



British Columbia



Alaska

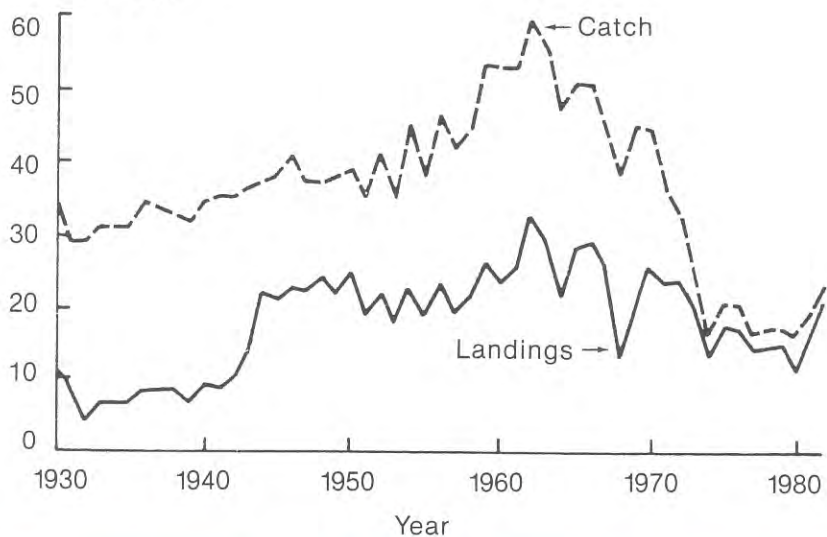


Figure 2. Catches and landings of Pacific halibut, 1930-1982.

was on and the price was right. With unlimited access to the Alaska fishing grounds where the bulk of the resource occurs, the Canadians increased their share of the coastwide catch from less than one-fifth to more than half between 1930 and 1970 (Figure 1).

By 1982, however, the Canadian share of West Coast

halibut landings had plunged to 18 percent. The factors responsible for the drop were several. There were shrinking seasons and growing competition from the expanded American fleet. There were economic considerations that gradually reduced the attractiveness of distant Alaska fishing grounds, and

finally the phasing down and eventual elimination in 1981 of reciprocal fishing privileges that had enabled Canadians to fish American waters, and vice versa.

While the halibut resource is still jointly managed by the United States and Canada through the auspices of the International Pacific Halibut Commission (IPHC), each nation's share of the catch since 1981 has been confined to the quotas established for the IPHC regulatory areas within its jurisdictional boundaries.

If the United States has benefitted at Canada's expense by the new method of determining each country's share of the halibut resource, Alaska has benefitted most of all (there is also a comparatively minor halibut fishery along the Lower 48 coast.) Despite the long term decline in resource abundance coastwide, Alaska's landings have fallen less than anyone else's (Figure 2), while the state's processors received a growing percentage share of coastwide production (Figure 3).

Except for some Puget Sound-based vessels that deliver the last Alaska catch of the season to processors in Washington, shorter seasons in most cases have made it impractical to sell Alaska-caught halibut in Washington where the highest ex-vessel prices are generally paid, a practice that used to be widespread. Also, the small vessels that now comprise much of the Alaska fleet simply do not have the carrying capacity to make it worthwhile to deliver outside of Alaska. A shrinking spread between Alaska and Washington ex-

vessel prices has also contributed to the delivery of more Alaska-caught halibut to processors there.

Some of the recent increase in Washington's share of the landings (Figure 3) has been due to deliveries by Canadian vessels attracted by the higher-valued American dollar. In 1982, over 1.5 million pounds or 29 percent of the British Columbia catch was delivered to Washington ports.

The advantage to Alaska of an increased share of both the catch and landings has been obscured by other not-so-welcome events. Of particular concern has been the long-term drop in abundance of halibut which, in combination with one of the most rapid buildups ever witnessed for any Alaska fishing fleet, has meant smaller profits to both fishermen and processors.

Earnings of individual fishermen have fallen as they have been forced to share smaller catches with more competitors. The growing fishing power of the fleet has resulted in catch quotas that are quickly exhausted. Seasons that now last for only a few days or weeks no longer provide a primary source of employment comparable to what used to exist for "old time" halibut fishermen.

Coping with landings that arrive virtually all at once because of shorter and shorter seasons has also been a problem for processors. They have required larger and more costly cold storage facilities to freeze and store a flood of catches, and have had fewer opportunities to market premium-priced fresh halibut. Higher costs and

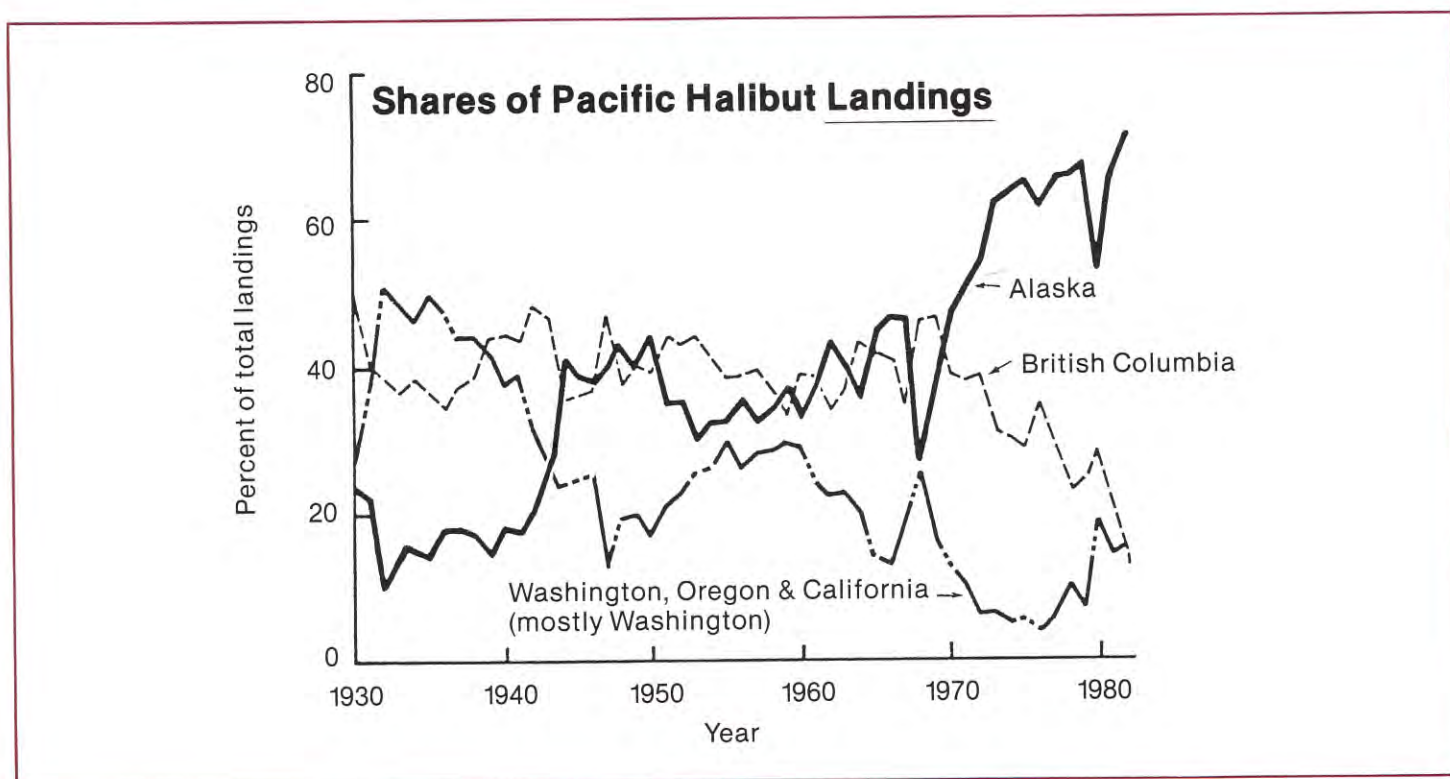


Figure 3. Shares of Pacific halibut landings in Alaska compared to the other Pacific states and British Columbia, 1930-1982.

lower returns to processors have inevitably been passed on to fishermen in the form of lower prices for their catches than would otherwise have occurred if landings had been spread over a longer time period.

Limited Entry

After a prolonged and often bitter debate, the North Pacific Fishery Management Council has recommended a three-year moratorium on new entry to the Alaska halibut fishery. As envisioned by the council, only fishermen who made legal landings during one or more of the years 1978 through 1982 would be able to fish during the 1983, 1984 and 1985 seasons. In addition to the freeze on the number of permits, the council proposes to limit fishing effort by preventing "upgrading," or replacing smaller boats with larger vessels. When this report was prepared, it did not seem likely that approval by the U.S. Secretary of Commerce for implementation of the plan would be granted in time for the start of the 1983 season.

The moratorium, which has been under consideration for over four years, is viewed by many halibut fishermen as an important first step in correcting the huge increase in fishing effort since 1976. The number of permits to fish halibut in Alaska has jumped from 600 in 1976 to over 6,000 in 1982. Part of the increase appears to have been in response to the rapid runup of halibut prices after 1977. Some observers feel, however, that prolonged talks of limited entry in the halibut fishery may have spurred many newcomers to "get a foot in the door." Whatever the reasons, the flood of new halibut boats, both small and large, has resulted in a drastic shortening of the season and has produced major changes in the processing and marketing of halibut.

The council is also analyzing the detailed report of a consultant dealing with an individual quota system, and other means of reducing excess capacity in the fishery and increasing the length of the season. Any significant steps in this direction would result again in major changes in both the fishing and marketing sectors of the halibut industry.

The moratorium issue has been bitterly contested, and any further steps to reduce fishing effort would doubtless provoke even more conflict. There is some opposition to both issues on the basis of the belief that any hoped-for gains would be outweighed by the high cost of administering such a system, and by the problems fishermen and others would likely have in coping with it. The greatest opposition has come from fishermen in Kodiak and other central/western Alaska ports, many of whom are comparatively recent participants in the halibut fishery. They view their ability to continue fishing for halibut as perhaps the only hope of surviving hard times brought about by the severely depressed fisheries in their region for king crab, Tanner crab and shrimp. Many small boat fishermen also fear they would be the first to be

disenfranchised in any share quota system, which they perceive as ultimately benefitting the large boat fleet.

1982 Fishery

The 1982 fishery for Pacific halibut produced a total catch by American and Canadian fishermen of 28.7 million pounds. This was 1.2 million pounds more than the recommended catch limit of 27.5 million, and was primarily due to larger than expected catches on some grounds off Alaska.

The 1982 landings of 20.5 million pounds in Alaska exceeded the 1981 landings by 3.6 million. Central Alaska ports, chiefly Kodiak and Seward, accounted for almost two-thirds of the statewide landings. Deliveries in 1982 of 2.6 million pounds to Sitka made it the largest port of landing for halibut within the southeast Alaska region, a position it also enjoyed in 1981.

Prices for frozen halibut, now the overwhelmingly dominant processed form, were weaker at the start of 1982 but showed a strong recovery toward the end of the year. Even with the somewhat depressed prices, halibut remains a premium product, with distribution geared more than ever to the restaurant trade.

Part of the weakness in 1982 prices probably reflected consumer reaction to the rapid runup in earlier years. Halibut must compete with a wide range of other fresh and frozen fish—high grade cod fillets and frozen salmon, for example—and some correction was to be expected. Since only slow to moderate increases in halibut landings are expected over the next five years, prices should hold firm, with some possible upward movement. Supply shortages and very high prices took halibut off many menus and out of many retail freezers in recent years, and those markets must be won back.

Encouraging signs of stock rebuilding continued to be seen in 1982, especially for halibut in the Gulf of Alaska. The abundance of young fish capable of supporting the fishery in the future was also reported to be increasing. The bad news from an IPHC report that the incidental catch of halibut in other fisheries was increasing was tempered somewhat by the explanation that the increase was partly due to greater halibut abundance.

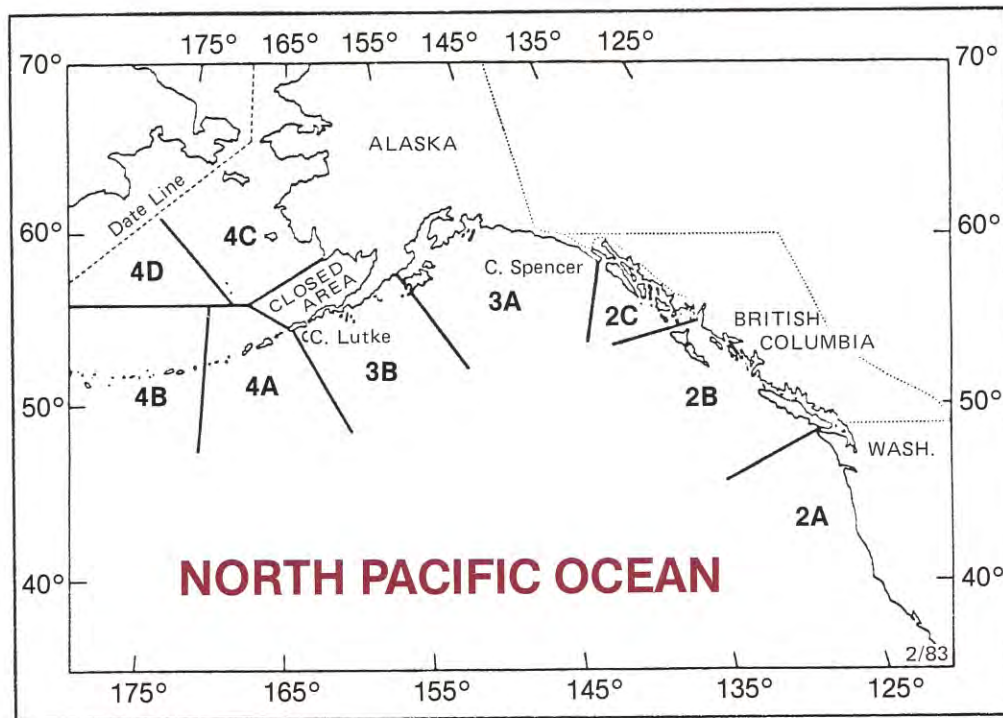


Figure 4. Regulatory areas for the Pacific halibut fishery, 1983.

Outlook for 1983 and Beyond

The improved status of the halibut resource is reflected by the 30.6-million-pound catch limit established for the combined 1983 U.S.-Canada fishery. This is a 3.1-million-pound increase over the 1982 recommended catch limit and a 5.6-million-pound increase over the corresponding 1981 figure. All of the 1983 increase is allotted to Alaska grounds in the central-western Gulf of Alaska, around the Aleutians and in the Bering Sea (IPHC areas 3B and 4, see Figure 4). Catch limits in other areas off Alaska, British Columbia and states to the south of Alaska will remain the same in 1983 as in 1982.

In order to assist communities on St. Paul, St. George, Nelson and Nunivak Islands in developing a halibut fishery, the IPHC created a new management area, 4C, within the Bering Sea, and assigned it a 400,000-pound catch quota for 1983. Another boon to the island residents was the establishment of a one-day closure following each 4-day opening throughout a general season that extends from mid-June to mid-September. Nonresident vessels will be discouraged by the requirement that they obtain a clearance at Dutch Harbor both prior to fishing in area 4C in each fishing period, and prior to unloading any halibut. Fishermen who are resident in area 4C and unload all of their

catches at ports within that area are exempt from this clearance requirement.

The outlook beyond 1983 is clouded by uncertainties about how abundant incoming year classes of halibut will be. Their abundance will be determined by both nature and the extent of mortalities resulting from fisheries targeting on other species. An additional complexity is that researchers have not been able to explain why the availability of halibut in the Gulf of Alaska is unexpectedly high, while at the same time it is aberrantly low off British Columbia. The only certainty seems to be that the rebuilding of halibut stocks will be a slow process because of the long-lived nature and other characteristics of the species. Catches by the directed setline fishery will not likely approach anywhere near their former high levels during at least the next decade.

pacific cod and other groundfish

When fishermen of the future look back on 1982, they may remember it as the year Alaska's bottomfish industry was reborn. For the first time, the Pacific cod industry began to establish a firm reputation backed by a high-quality, reliable product. The Alaska pollock fishery saw expanded joint venture catches in 1982, as well as several other significant developments outlined in this report.

Other groundfish industries increased joint venture efforts in 1982 as well. The Atka mackerel harvest by US-USSR joint ventures in the western Aleutians made a quantum leap from 1,633 tons in 1981 to 12,475 tons in 1982. The sablefish fishery off the southeastern Gulf of Alaska was closed on August 2, 1982, the first early closure of the fishery since the establishment of the FCMA in 1976. Strong domestic and Japanese markets are encouraging more voracious harvesting than in previous years, and biologists say the 2,187 ton harvest will probably be duplicated in 1983.

The major 1982 development in the fledgling Alaska groundfish industry is the establishment of a viable domestic catching-processing-marketing sequence based on flourishing stocks of Pacific cod. After a long hiatus during which American fishermen and processors ignored cod, production is again soaring in Alaska. Having convinced a skeptical marketplace of their ability to deliver quality products created from North Pacific cod, producers have cleared the single largest hurdle that stood in their way as recently as two years ago. Their reward is a hard-won niche in the hotly competitive international cod trade.

The Pacific and Atlantic cod fisheries are as intermingled with America's history as the sea itself. Atlantic cod fishing during the colonial era helped our nation establish an economic base. The fishery not only supported many of the country's settlers, but its primary product, dry salted cod, comprised the main food supply for most of the long sea-going voyages of the day.

When Captain Matthew Turner and his crew aboard the trawling dory *Timandra* discovered huge schools of cod on the Asian Pacific coast in 1857, they opened the door to one of America's largest and most significant fishery resources of today—Pacific cod.

Beginning in 1864, American fishermen pursued cod along the northern Pacific coast, fishing from two-man dories and delivering their catches to "dressing stations" spread along the Alaska Peninsula and northward. For the first 63 years, landings averaged 20 million pounds per year, most of which was processed into dry salted cod.

Japan first became interested in Alaska's wealth of groundfish species in the late 1930's, directing their attention to the harvest of pollock for fish meal. The U.S.S.R. began fishing for flounder in the eastern Bering Sea in the 1950's, joined by several other foreign countries pursuing bottomfish later in that decade. For most of these fisheries, cod was an incidental catch and rarely a target species. U.S. interest in Pacific cod waned altogether in the early 1950's when it became less profitable, though other countries continued harvesting groundfish in Alaskan waters, still targeting most often on pollock or flounder species.

In the late 1960's foreign catches of Pacific cod in Alaska began a swift climb to levels exceeding 150 million pounds annually in the Bering Sea alone. Foreign catches of groundfish species in the Bering Sea skyrocketed in the early 1970's, to comprise an average of more than 5 billion pounds per year. Pacific cod, which until then had been targeted only by Japanese longliners, began to claim a significant proportion of the total fishery. In 1978, cod comprised over seven percent of the foreign catch of groundfish in Alaska.

The Fishery Conservation and Management Act (FCMA) of 1976, along with the high foreign catch rates of that time, rekindled America's interest in the Pacific cod fishery. U.S. fishermen slowly began to become involved, and during the 1970's, U.S. landings increased from 42,000 pounds to 3.9 million pounds. As joint ventures and other U.S. projects took hold after 1979, U.S. catches of Pacific cod in Alaska jumped to 30 million pounds in 1980 and to 89 million pounds in 1982.

Stock assessments show a sevenfold increase in the cod biomass between 1975 and 1979. The population explosion seems related to a significant warming of the Bering Sea,* coincident with the apex of the natural cycle of year-class strength in Pacific cod. Also during that five-year span, according to the National Marine Fisheries Service, the most productive cod fishing grounds shifted into the central shelf area between the Alaska Peninsula and St. Matthew Island.

Because the year-class of Pacific cod that brought with it such significant changes peaked in 1979-80, it is difficult to predict how long the high yields will last, or how quickly they will drop again in their natural cycle. Biologists say strong year-classes will support an optimum yield of 120,000 metric tons in 1983, and 180,000 to 200,000 metric tons in 1984. But the natural cycle of the biomass is expected to bring a decline in the year-classes after 1984, which will decrease the optimum yield. Until biologists learn a great deal more

* According to a NMFS survey of 1980, the waters of the central shelf area of the Pacific rim rose in temperature from 35.6°F (2°C) in 1975 to as high as 42.8°F (6°C) in 1979.

about this natural cycle, few predictions about the future of the cod supply beyond 1984 can be made.

The 1982 season brought 27,031 metric tons in directed U.S. landings, 55,112 metric tons by directed foreign fisheries, and 13,784 metric tons in joint venture catches of Pacific cod. The going price at Trident Seafoods' processing plant at Akutan Island was \$286/MT for bled whole fish over 24" long, and \$176/MT for smaller fish. This spurt of growth, and the increasing interest of all sectors of the industry, indicate that the Pacific cod fishery of Alaska has indeed been reborn.

While a re-established North Pacific cod industry conducted by domestic entrepreneurs is now a certainty, new entrants to the Alaskan cod business embark on a path that is hardly strewn with roses. Says one already-established Alaskan cod producer, "the last two years were easy" compared to the task of marketing frozen Pacific cod products today. What it means, he suggests, is a continuation of what has occurred up to now, with numerous new ventures and many subsequent failures until the industry "grows up," and the sizeable group of aspirants now eyeing the immense cod resource is winnowed to a sustainable number of competitive operators. The primary hazards stem from competition with Atlantic cod in a complex international commodity market for frozen, salted and dried products. The market is solidly dominated by Canadian and European suppliers who are often subsidized, and prices are controlled by the governments of the consuming nations. The U.S. catch of Pacific cod is less than 2 percent of world cod landings, leaving American producers no opportunity for market power.

Whether groundfish species such as cod can be processed more profitably at sea or on shore remains a controversial issue among Alaskan producers. The shore-based mode is attractive to much of the processing sector who have incentive to increase utilization of existing plants. It is also favored by the State of Alaska, because it offers local year-round employment.

Shore-based processing affords other advantages, such as high plant capacity and flexibility of the species and product form handled. However, it requires large capital investments and entails tremendous risk associated with fixed location. To test the economic viability of shore-based operations, the logical choice of target species is the Pacific cod, since it is abundant, versatile in terms of finished product possibilities, and more valuable than the other white fish species. A major pioneering venture was launched in 1982, with construction of a large processing plant at Akutan, in the Aleutian Islands, by Trident Seafoods Corporation.

The \$12 million multi-species plant began processing cod in June 1982. The chosen product form was split wet salted cod, with later diversification into small amounts of stockfish (air dried gutted fish) and filletoni (salted fillets). For reasons that may remain mysterious,

landings were unexpectedly low during the fall months. Deliveries shot upwards in mid-January 1983 and persisted at high levels through April, until post-spawning dispersal of the fish. Trident met the challenges of weather-curtailed fishing effort, competition with the joint ventures for a supply of raw fish, training a work force in production methods entirely new to them, and obtaining access to distant markets controlled by unstable and unfamiliar political forces. Though the early months were not without frustration, Trident's accomplishment embodied the aspirations of the entire North Pacific fishing industry.

The marketing difficulties encountered by Trident exemplify the situation facing all suppliers of Pacific cod. The major markets for cod products, in countries like Portugal and Nigeria, are subject to governmental manipulation and unpredictable political events. Competing suppliers are major fishing nations where industry-government ties are strong. One of Alaska's larger processors but still a small company by most standards, Trident was effectively in competition with the governments of principal fishing powers such as Iceland, Norway, Denmark, and Canada. Rather than selling to large numbers of individual buyers, they sold in large quantities to cartels organized and controlled by volatile governments. Fluctuating currency exchange rates further complicated marketing strategies.

Decisions about product form and marketing plans will be even more difficult for cod producers in 1983. As the U.S. dollar gained value relative to the Portuguese escudo, the Portuguese market for wet-salted cod has softened. In Nigeria, a drop in the price of crude oil forced the government to restrict imports severely in 1982, essentially shutting off the world's largest stockfish market indefinitely. Major cod producers reacted by shifting away from salted and dried product forms, into frozen products.

The weakening of principal markets for dried and salted cod products jeopardized or bankrupted the Alaska salting operations that were launched in 1981 and 1982 in response to strong market conditions. It also precipitated a flood of frozen cod onto the U.S. market from Norway, Iceland, a rebounding eastern Canadian cod industry and a fast-growing cod effort on the U.S. east coast. That has made the marketing equation substantially trickier for producers of frozen cod, but as one established player asserts, it's a big, strong market and the stable suppliers of high quality North Pacific cod products will survive. Such positiveness is evident in the fact that the west coast fleet is in the midst of a dramatic expansion into trawling operations, including construction of new factory trawlers.

But the inroads made by Trident and other participants in the development of the Pacific cod fishery are significant indeed. Working with as many as 13 vessels, Trident's Akutan plant processed nearly 30 million pounds of Pacific cod between June, 1982, and April,

1983. That figure alone represented a 36 percent increase over domestic Pacific cod production in 1981, and left little doubt that the facility was well situated with respect to resource availability. It was an auspicious beginning that buoyed industry hopes, especially those of fishermen with boats in need of a fishery. After almost a year of operation that seemed a true test and demonstration that shore-based cod processing could be commercially viable, the Akutan plant suffered a disastrous fire in June, 1983. The destruction of the plant was a jolt and a setback to the entire industry, but it is hoped that the momentum and the market position achieved by Trident for Alaska cod products will help carry the industry through while new facilities can be built.

Shore-based white fish processing is still in its embryonic stages, and much is yet to be learned by everyone involved. Fishermen new to the vicissitudes of the cod resource are still learning how to anticipate the biological factors that influence the supply of fish. Plant managers—especially those in remote locations where response time is slow—need to learn how to make accurate long-range plans that will provide for the plant's needs without raising fixed costs during slow periods. Slowly, both sectors will learn how to use the plant to its fullest, year-round capacity.

The processor, however, is the link between Alaska's bountiful cod resource and the hungry worldwide market. Therefore, aggressive marketing and consistent quality control are the processing sector's primary goal. As exemplified by the Trident Seafoods plant and the *Golden Alaska* floating processor ship discussed forthwith, great strides toward developing that link between resource and market have been made in 1982.

The *Arctic Trawler*, the first of the factory ships to enter this country's reborn North Pacific cod fishery, has been the standout performer in terms of establishing a harvesting-processing-marketing track record for frozen Alaskan product, and its "Arctic Fresh" label is now a fixture in the domestic frozen food trade. In its four years of operation in Alaska, the *Arctic Trawler* has pioneered the domestic market for Alaskan cod, and illustrated to the world the fact that the U.S. industry is capable of sustaining high quality production on a consistent delivery schedule.

Over 45 domestic vessels harvested Pacific cod in joint ventures in 1982. An additional 37 vessels reportedly landed cod at Akutan or Dutch Harbor, according to Alaska Department of Fish and Game figures. The *Arctic Trawler* delivered its packaged, frozen fillets directly to Seattle.

More recently, vessels like the *American No. 1*, the *Northwest Enterprise*, the *Sea Alaska* and the *Golden Alaska* have augmented the at-sea component of the North Pacific cod industry. *Golden Alaska* is a 302-foot vessel that operates as a mothership for a fleet of catcher boats, while *Sea Alaska* processes trawl-caught groundfish in Dutch Harbor, and the others are trawlers that have added processing and freezing

capabilities. The exciting amount of activity now underway in the construction and conversion of vessels like these will significantly expand the industry's capability to produce frozen, processed product at sea.

A portion of Alaska's fleet of crabber-trawlers, pure fishing vessels that have been displaced by the plunge in shellfish production in the North Pacific, have been engaged in cod operations aimed at the salt fish market, either by splitting and salting on board or delivering to a processing company like Trident. How seriously the decline of the salt fish market will affect their efforts remains to be seen.

When the *Golden Alaska* was christened in October 1982, the U.S. industry took a significant step toward tapping the potential of the domestic market for cod. Claiming a processing capacity of up to 440,000 pounds a day, the *Golden Alaska* projects purchases from U.S. fishermen of 25 to 30 million pounds during the 1983 year.

The factory ship, working with a fleet of five to seven fishing vessels, produces high-quality skinless, boneless cod fillets. The ship is equipped with filleting, deboning, candling, packaging, freezing, and storage capacity, and is capable of producing finished products from Alaskan pollock and other incidental groundfish species as well.

The *Golden Alaska* is a foreign-bottom boat flying an American flag, and thus can deliver to one U.S. port under provisions of the Nicholson Act. The *Golden Alaska* delivers its frozen, packaged product to Dutch Harbor, where it is transported to U.S. markets.

Following after a solid foundation built by *Arctic Trawler*, the *Golden Alaska* and Trident's shore-based plant at Akutan together represent a major breakthrough for the U.S. cod industry. These two efforts—each exemplifying the viability of domestic control, on-shore and at sea—have opened doors for other U.S. companies to seek opportunities in developing this bountiful fishery. These two ventures have begun the painstaking task of building an infrastructure upon which the Alaskan cod industry can grow.

The two pioneering projects have also served another purpose; to provide in physical, financial, and philosophical terms an actual working model—full of problems, setbacks, defeats and victories—from which the rest of Alaska's groundfish industry can learn and build.

the pacific pollock story

Introduction

In November, 1981, a conference on Pacific Pollock took place in Anchorage, Alaska. The proceedings of the conference appeared in a red-covered report, somewhat facetiously titled, "Alaska Pollock, Is It a Red Herring?" The report included a fact sheet that provided some startling statistics about a species that had never been exploited by the U.S. fishing industry despite vast stocks that existed in Alaska's backyard. Foreign factory fleets fished those stocks heavily throughout the year, but this country's fishermen and processors had never devised an economic rationale that would enable them to compete.

The fact sheet produced by the pollock conference, however, moved this junior relation of the cod fish into the regional, national and international commercial fishing limelights. In many respects, this one fish represented the future of the U.S. commercial fishing industry.

Pacific pollock had become the Number One species in the world in terms of volume of landings; and probably in value as well. The biomass of Pacific pollock was estimated to exceed that of any other conventionally exploited fin fish species in the world. World catches of pollock were noted to have ranged between 4.5 and 5.5 million metric tons annually, or over 2 pounds every year for every man, woman and child on earth. The ex-vessel value of commercial pollock landings was estimated to exceed \$1 billion a year, while the value of processed products was estimated to exceed \$3 billion. It became apparent that not only was pollock an enormous plum for the fishing industries of numerous nations, but a significant factor in the world supply of protein.

The pollock fact sheet was picked up and echoed by numerous local newspapers, as well as by national and international fishery papers, journals and magazines. The facts were illuminating, but an old problem continued to perplex U.S. fishermen and processors alike: "We know there is a hell of a lot of fish out there, but how do we make a buck out of it?"

Though the question remains, the northeast Pacific pollock fisheries are undergoing major changes.

The U.S. cod fishery in the Bering Sea and Gulf of Alaska, which was just awakening from a 25-year sleep at the time of the pollock conference, has grown rapidly. In fact, it has grown so fast that the 1984 Bering Sea catch may well reach the Optimum Yield level, thus triggering a phase-out of all directed foreign fishing on cod within 200 miles of the U.S. coast. Domestic production, which is the result of both shoreside and at-sea processing, exceeded 25,000 metric tons by April, 1983, and could surpass 60,000 tons before year's end.

Although efforts to displace foreign blackcod

fishermen by a similar expansion of domestic production have not progressed as rapidly as anticipated, gains have been made in southeast Alaska, and further growth in the U.S. fishery is expected this year.

To date, the domestic entree into the exploitation of pollock has been dominated by over-the-side joint ventures which produced catches that spurred from several thousand tons in 1979 to over 115,000 tons in 1982. This total, however, is likely to be dwarfed by the expected U.S. catch for 1983, which may exceed a 250,000 tons.

Thus, in the short 18 months since the 1981 pollock conference, U.S. fishermen and processors have made sustained progress in the development of a major bottomfish industry. Except for cod, most of the action has entailed over-the-side sales by U.S. fishermen to foreign processors. The involvement of U.S. processors with pollock has been limited to the production of small quantities of frozen fillets in shoreside plants or aboard factory trawlers, and more recently the production of fish cakes. Even so, there is a strong and growing interest by the U.S. processing sector. As put by one processor, "what is left to do in Alaska is either re-deal salmon and shellfish ... or enter a new game, and the only major new game in town is Pacific pollock."

Our story includes a review of factors influencing the pollock game, how it has and can be played, and the likelihood that this country's fishing industry will become a winner.

The Resource

The facts and figures presented at the Anchorage conference provided convincing evidence that Pacific pollock is an ubiquitous species that spans the northern Pacific Ocean. The history of foreign fishing, and the U.S. experience over the past two years in pollock joint ventures, has also proved that the species can be readily caught. However, before deciding to invest in the pollock game, prospective players must have a quantified understanding of the pollock resource potential.

Figure 1 shows the distribution of pollock in the North Pacific Ocean and areas of major fisheries. During the past several years, annual world production of Pacific pollock has stabilized at around 4.5 million metric tons. In recent years, the contribution from the U.S. Fishery Conservation Zone (FCZ) to the world total has been about 27 percent, or approximately 1.2 million metric tons annually. The higher level of production from the western Pacific may reflect a larger biomass or more liberal fishery regimes. We suspect both factors are involved.

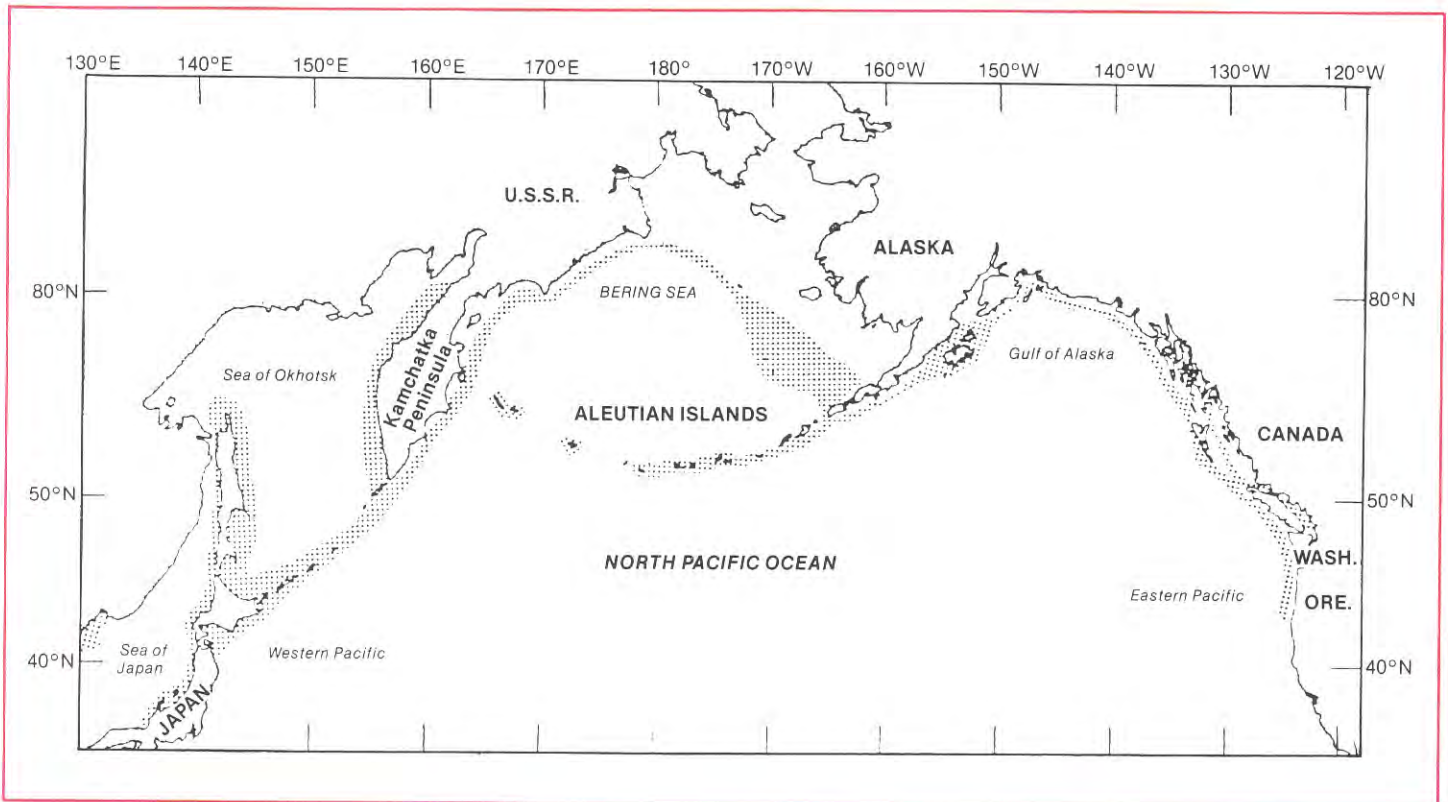


Figure 1. Geographic distribution of Alaska pollock.

In “counting our cards” in the pollock game, we should not overlook the fact that between 1971 and 1974, the FCZ off Alaska consistently produced between 1.6 and 1.9 million metric tons of pollock annually (Figure 2), or close to 40 percent of the world total. Subsequent declines from U.S. waters appear to have resulted from increased U.S. pressure to control foreign fishing activities and the imposition by the U.S. of a relatively conservative management regime. The long-term contribution to world supplies of pollock from the eastern Pacific is still subject to debate, but it does not seem out of the question to suggest that if all stocks from the Bering Sea, the Aleutians and the Gulf of Alaska are harvested to their full biological potential, production from the U.S. FCZ could approach 2 million tons annually. The dominance of pollock within the northeast Pacific groundfish complex, is shown in Figure 3.

The question inevitably arises of whether or not the U.S. stocks will sustain current production levels, and to what extent natural factors govern their abundance. Not much is known about these factors, but the catch records since the development of large-scale foreign pollock fisheries in the late 1960's suggest a relatively stable supply. Total catches in the northeast Pacific since 1970, for example, have varied between 1 and 2 million metric tons, with the largest catches having been slightly less than double the smallest. In contrast,

salmon runs, crab and shrimp catches have varied from five- to ten-fold in the same time period.

When one mentions pollock in Alaska, it is commonly associated with the large foreign trawl fisheries or, more recently, with the over-the-side deliveries by U.S. trawlers to foreign processing ships. It may come as a surprise to learn that even in the late 1970's, Japanese gillnet fishermen annually landed over 250 million pounds, and longline fishermen almost 100 million pounds from the western Pacific. In combination, gillnet and longline fishermen in 1978 produced over 10 percent of the total Japanese harvest. Purse seining has also been successful in Korea.

The first country to actively fish pollock on a large scale was Korea prior to World War II. Although the statistics are less than adequate, annual catches of over 250,000 tons were reported, primarily from the “Korean Bight” on the Pacific side of the peninsula. Japan's entrance into the pollock game took place in the early Sixties, following successful development of techniques to produce *surimi* (fish paste) from pollock and the adoption of modern refrigeration throughout Japan.

The combination of technological developments, extensive marketing and the development and

promotion of new products rapidly expanded demand for pollock, and led to the creation of modern, at-sea factory trawler and mothership operations for the production of *surimi*. The availability of large quantities of relatively cheap (\$0.30 to \$0.50 per pound) *surimi* in turn promoted a significant increase in the varieties of *kamaboko*-type (fish cake) products consumed in Japan.

Through rapid expansion of *kamaboko* plants throughout Japan, refrigerated delivery systems and an upgrading of their distant water fleet, the Japanese increased their pollock production and processing capability at a staggering pace. Landings grew from a few hundred thousand tons annually in the early 1960's to over 2,300,000 tons in 1970. By the mid-1970's, Japanese pollock catches peaked at over 3,000,000 tons. In the following five years, the Japanese catch plummeted to about half its former peak, largely as a result of the extended jurisdiction over marine resources imposed by the U.S.S.R. and the U.S. The Japanese *surimi* output, however, did not greatly suffer from the drop in catch because the country channeled a

greater portion of its pollock landings into *surimi*, with a corresponding drop in meal and fresh fish production.

The Soviets, who in recent years have dominated the North Pacific pollock scene with annual catches of around 2 million metric tons, appeared relatively uninterested in pollock during their rapid (1954-1965) expansion of fisheries in the Bering Sea. With the onset of extended jurisdiction, however, Soviet catches in the eastern and western Bering Sea rose sharply. In 1977 the Soviets took the lead in pollock production and have remained the game's top performer in recent years, although U.S. observers tend to overlook the Soviet role in the pollock equation due to a preoccupation with Japanese activities. This is not surprising, because of the role the Japanese have played in the eastern Pacific and the obvious success of their multi-billion dollar pollock industry. Regardless, the U.S.S.R. now accounts for a larger portion of total pollock landings than any other nation, and the Soviets and North Koreans now produce about 55 percent of the world total.

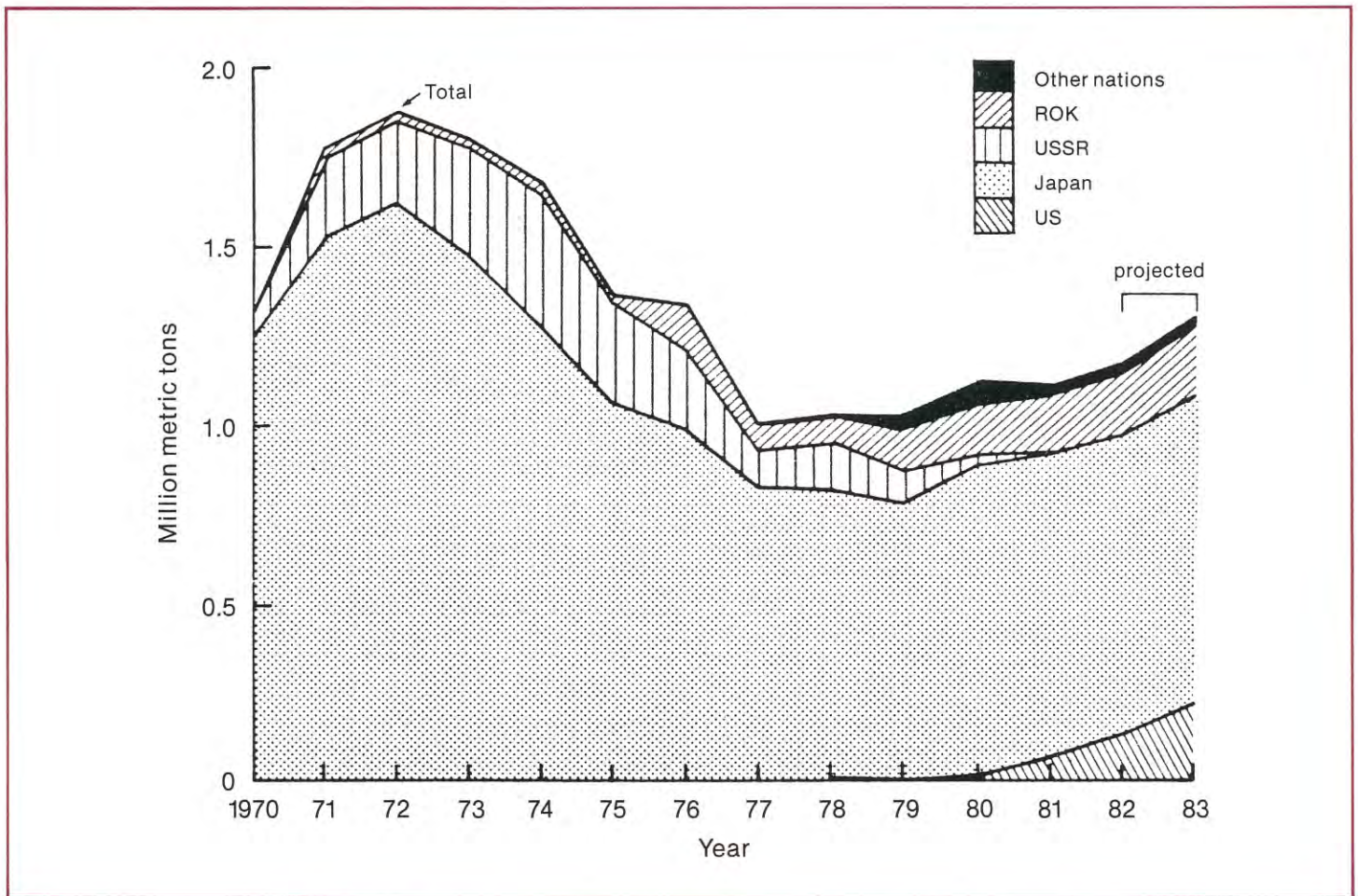


Figure 2. Catches (metric tons) of Pacific pollock by principal producing nations from waters within 200 miles of Alaska, 1970-1982, and 1983 projection. U.S. catch is mostly from joint ventures with foreign processing ships.

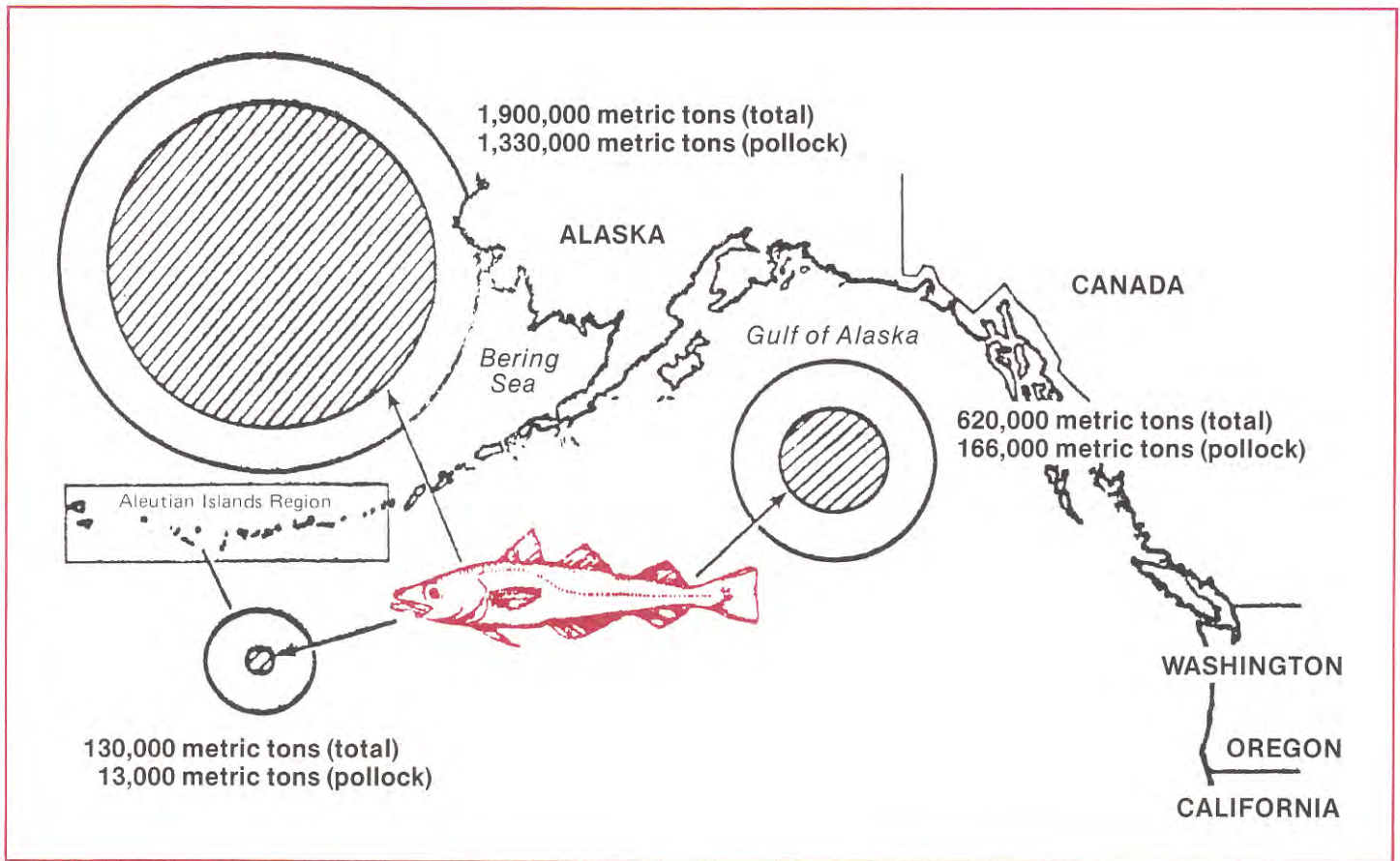


Figure 3. Proportion that Maximum Sustainable Yield (MSY) of Alaska pollock comprises of the total MSY for all Alaska groundfish.

Source: National Marine Fisheries Service.

Korea, the first large-scale producer of pollock, was slow to set its game plan in motion following the termination of World War II. Civil war split the nation and shattered hopes of a rapid recovery on both sides of the divided country. Expansion of South Korean fisheries began in the early 1970's, and that country's catch of pollock peaked at about 0.5 million metric tons in 1975.

Prior to extended jurisdiction by the U.S.S.R. and North Korea, most of the South Korean catch was taken in the western Pacific. In the period following extended jurisdiction, South Korea expanded its distant water production, harvesting between 25 and 35 percent of its fish in the U.S. FCZ.

The North Korean story is less well known but its current export of roe to Japan suggests an annual catch of pollock of between 300,000 and 500,000 tons. For over a decade, the big three, Japan, the U.S.S.R. and Korea have dominated pollock production—catching and utilizing over 99 percent of the world harvest.

In the late 1970's, Poland and Taiwan entered the scene in minor roles. The North American story before the beginning of this decade was only a ripple in a tidal wave of Asian domination. For some years, Canada

harvested small quantities of Pacific pollock from its inside waters and sold the catches as fillets. A small-scale filleting operation was initiated by Icicle Seafoods Co. of Seattle in southeast Alaska during the late 1970's. Other entrepreneurs have taken a chance on pollock or at least examined its potential for U.S. white fish markets. Total production by Canadian and U.S. interests, nevertheless, constituted less than one-tenth of one percent of the total world harvest through the 1970's.

By the beginning of the 1980's, the game cards were all in the hands of the U.S.S.R., Japan and Korea. In slightly less than two decades, these three countries turned a little known cod-like species into the single primary commercial food fish in the world.

This spectacular growth was the result of a number of factors, including technological breakthroughs in Japan, the national fishery goals of the Soviets, and the rebuilding of an historical Korean fishery. From an economic standpoint, a number of factors contributed to the all-Asian success story. Labor costs were low or "controlled;" governments subsidized vessel construction and operations; and a ready demand for fish protein products existed. All these factors provided

the Asians with a distinct advantage over North American competitors who were faced with high labor and vessel construction costs, an extremely competitive white fish market dominated by foreign imports, and a more finicky consumer when it came to fish. In Japan, a significant chapter of the success story entailed major investments to develop the technology, infrastructure, products and markets necessary to sustain a major industry.

In 1979, American fishermen began to realize that they might take money fishing pollock when small-scale Soviet and South Korean over-the-side joint ventures purchased about 600 tons of American-caught product. Even these rather unimpressive sales, however, resulted in an angry debate with processors and those fishermen who were against the concept of over-the-side deliveries to foreigners. They opposed the efforts of a few persistent fishermen and a newly-founded corporation, Marine Resources Company of Seattle, who perceived an opportunity and felt that the law was on their side.

From the perspective of many American fishermen, the thought of fishing pollock for \$.05 to \$.06 per pound when they could get many times that much for salmon or crab was not very interesting. And, Alaskan king and Tanner crab landings were then reaching all-time highs.

The processor reaction was both predictable and understandable. They saw joint ventures as a setback to their long-frustrated hopes of developing a full domestic harvesting-processing-marketing sequence founded upon bottomfish, a sequence that would utilize their shoreside processing plants or floating processing ships.

The rather lackluster entrance of the U.S. into the pollock game in 1979 and 1980 by means of the modest joint ventures, coupled with the somewhat unprofessional commencement of the Korean venture, was a signal to many that joint over-the-side deliveries to foreign partners would be short-lived. The joint venture enthusiasts, however, were not to be deterred. New permits and expanded quotas for joint-venture operations were awarded in 1980, and the first notable over-the-side deliveries of pollock by U.S. fishermen (over 14,000 tons) were recorded.

In 1981, Japan, Poland and West Germany began buying pollock in this fashion. The Koreans also expanded their operations, and the combined pollock production from all joint ventures approached 60,000 tons, a figure still small in terms of the world pollock game, but a U.S. beginning, nonetheless.

The U.S. pollock hand was strengthened in 1981 and 1982 by four significant actions. First, discouraged by the slow growth of the U.S. bottomfish industry, Congress modified the Magnuson Fishery Management and Conservation Act (MFCMA) to permit greater flexibility in the use of directed fishing allocations to foreign nations to give preference to those assisting U.S. fishery development. Secondly, the

Departments of Commerce and State took an aggressive posture toward assisting the U.S. fishing industry by putting heavy pressure on foreign operators to accelerate joint venture involvement, a posture which led to expanded Korean operations.

Thirdly, a U.S.-Japanese industry-to-industry joint venture meeting led to a commitment by the Japanese to step up over-the-side purchases beginning in mid-1982 and extending through 1984. Finally, the collapse of the crab and shrimp fisheries in Alaska left many U.S. vessel operators with no alternative but participation in joint ventures.

This combination of government and industry action and pressure began to pay off. In 1982, the U.S. fishery was "out of the blocks" in January with two Japanese and two Korean companies providing a total of 10 processors to handle deliveries from 16 U.S. catcher vessels working the pollock stock then spawning in Shelikof Strait. By May, the U.S. fishermen had delivered close to 70,000 tons, and the U.S. vessels delivering to the two Japanese factory trawlers had averaged close to 90 tons per day.

During the summer, the pollock joint ventures expanded from Shelikof Strait westward to Unimak Pass and into the Bering Sea. By year's end, a total of eight foreign joint ventures were involved in purchasing pollock over-the-side from some 28 U.S. catcher vessels. The U.S. catcher fleet, made up of vessels ranging from 80 to 130 feet in length, were serviced by 15 processors. U.S. pollock deliveries exceeded 115,000 tons. Table 1 provides details on the partners involved, the location of fisheries, prices, numbers of catcher vessels and processors involved, and end products.

The 1982 season constituted a major U.S. inroad into the traditional Asian domination of pollock harvest. For U.S. fishermen, it was a learning period; a season to prove what they long felt was possible; a period to build confidence. It was not, however, without mishaps. Breakdowns occurred in equipment, and squabbles erupted over operational needs and contracts. In the end, however, the fishermen were more convinced than ever that they could do the job. The importance of pollock in the growth of joint ventures is shown in Figure 4.

In addition to joint venture activities in 1982, small quantities of pollock were caught and processed into fillets by U.S. catcher-processors such as the *Arctic Trawler* and the *Northwest Enterprise*, and by the West German vessel *Friedrich Busse*.

While pollock is fundamentally an excellent form of white fish, very similar to cod, there are impediments to producing pollock fillets. Two obstacles are the occurrence of a large proportion of small-sized fish which are hard to process, and occasional infestations by parasites. While these obstacles have been cited in the past as sufficiently serious to make filleting operations unfeasible, catching adequate quantities of appropriately sized fish and eliminating the parasites

COUNTRY	FOREIGN COMPANY	U.S. PARTNER	OF OPERATION	TARGET SPECIES	NUMBER OF FOREIGN PROCESSORS	NUMBER OF U.S. CATCHERS	1982 TOTAL JOINT VENTURE CATCH (M.T.)	PRICE PER POUND	JOINT VENTURE PRODUCTS
Japan	Hoko Fishing Co. Ltd., Tokyo	Jeff Hendricks Associates Anacortes, WA	Bering Sea	Alaska Pollock	1	4	11,632	\$.05	Surimi Meal
	Ohtori Suisan Co., Tokyo	Whitney-Fidalgo Seafoods Seattle	Gulf of Alaska	Alaska Pollock	1	3	9,932	\$.05	Surimi Meal
	Nippon Suisan Kaisha, Ltd. Tokyo	Universal Seafoods Redmond, WA	Gulf of Alaska Bering Sea	Alaska Pollock	1	3	21,317	\$.048	Surimi Fillets Meal
	Taiyo Fishing Co., Tokyo	Westward Trawlers Steuart Fisheries Everett, WA	Gulf of Alaska	Alaska Pollock	1	2	17,000	*	Surimi Roe Meal
S. Korea	Korea Wonyang Fisheries and Korean Marine Industry Devel. Corp., Seoul	Fish Producers Associates Steuart Fisheries	Gulf of Alaska	Alaska Pollock	6	7	32,000	\$.06	Fillets Roe Meal Round
	North Pacific Joint Venture Operations Committee	Joint Venture Fisheries, Ltd. Bellingham Cold Storage Bellingham, WA	Gulf of Alaska	Alaska Pollock	2	3	16,321	\$.0625	
Poland	BH2 Rybex	Mrs. Pauls Kitchens, PA Fishing Ventures International	Gulf of Alaska	Alaska Pollock	3	2	7,000	\$.054	Headed and Guttled Meal Fillets
W. Germany	Hochseefischerei Nordstern Bremerhaven	Independent Fishermen	Bering Sea	Pacific Cod Alaska Pollock	1	4	4,000	*	Fillets
Taiwan	Chong Shing Ocean Enterprises Corp.	Swiftsure Fisheries	Bering Sea	Pacific Cod Alaska Pollock	2	1	*	*	*

***Information Unavailable**

Table 1. 1982 international joint venture operations in the northeast Pacific and Alaskan waters. Source: Kaczynski, 1982; Fishery Management Council memorandum; NMFS observer reports and personal communication Kaczynski.

may not be as large a problem as originally perceived.

Several operators state that these constraints can be overcome by selecting fishing grounds and carefully trimming products. Fillets from pollock generally range from about 25 to 30 percent of round weight depending on product form. The yield from trimmed fillets with pin bones removed appears to be about 25 percent. If the pin bones and belly flaps are not removed, fillet

yield increases to 29 or 30 percent.

In a little over two years, the pollock game has changed dramatically. Although some problems in joint ventures have occurred, the U.S. North Pacific fleet has demonstrated its ability to sustain high levels of production. The number of fishermen engaged in such operations has grown rapidly. From the involvement of only a few vessels and processors in 1980, operations

have grown to include over 25 catchers and 15 at-sea processors in the span of two years. The joint ventures planned for 1983 should employ more than 40 catcher vessels.

This year's catch from Shelikof Strait exceeded 130,000 tons and was particularly important by virtue of the growing Japanese participation. Japan remains by far the dominant factor in pollock production from the U.S. FCZ, and is the nation best able to either thwart or assist this country's entry into the pollock game. The first instances of U.S.-Japanese cooperation in pollock production, which occurred last year in Shelikof Strait, were thus matters of extreme interest to U.S. observers, and the fact that the ventures proved successful to both parties was an extremely favorable sign for the future.

The stocks that accumulate in Shelikof Strait each winter are densely schooled and easy to harvest. More importantly, the region serves as a late winter-early spring spawning area for pollock, and a high percentage of females bear quality roe which is a high valued product for Japanese markets.

Based on samples taken by U.S. industry observers

on Japanese trawlers, it is estimated that about 5,460 metric tons of roe were taken in the 1983 Shelikof fishery worth approximately \$45 million on the Japanese market. The surimi and other items produced in the ventures are assumed to have been worth another \$40 million.

Thus, the 1982 winter-spring fishery in Shelikof Strait is projected to have been worth about \$85 million to Japan and Korea. U.S. fishermen received about \$12 million for their catches.

Joint venture advocates have been the obvious winners in the first U.S. forays into the pollock game. Even some U.S. processors have either joined ranks, or accepted joint ventures as an essential learning process during the evolution of a major U.S. pollock industry. For the most part, however, U.S. processors have been on the sidelines as U.S. fishermen have established a foothold in the pollock game.

Nevertheless, processors won a major concession in the opening rounds with the so-called MFCMA "processors preference" provision which requires that fishermen delivering to U.S. processors get top priority in fish allocations. This provision may eventually shape the emerging industry.

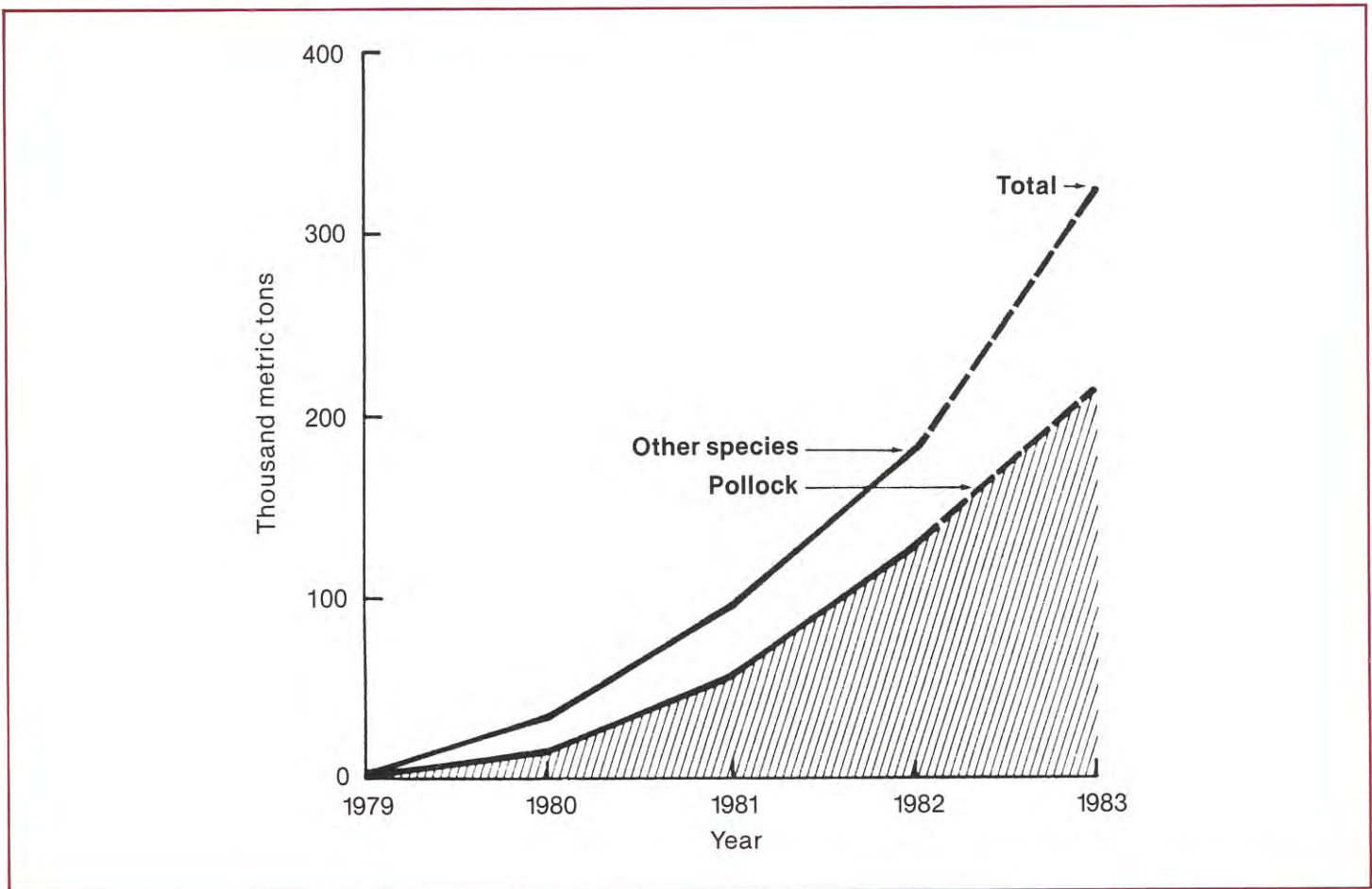


Figure 4. U.S. joint venture catches (metric tons) of Alaska bottomfish with proportion contributed by Pacific pollock, 1979-1982, and 1983 projected.

PRODUCER	QUANTITY		END PRODUCTS	
	TOTAL		CHILI	OTHER
Japanese Local Trawler	15,300	10,600	4,500	200
Japanese Distant Water Trawlers	9,700	9,200	500	
Soviet Trawlers	2,700	1,700	500	500
North Korea	7,100	2,500	4,000	500
South Korea	7,400	4,700	2,500	200
U.S. Trawlers	3,804	?	?	3,804
Total	46,004	28,700	12,000	5,204
Japanese Production	25,000	19,800	5,000	200
Imports	21,004	8,900	7,000	5,004

Table 2. Pollock roe production (in metric tons) and uses in Japan.

Markets and Products

The world market for Pacific pollock has traditionally been dominated by Asian consumers. Before World War II, dried pollock was a common product in northern Japan and Korea. Pollock was also consumed fresh, although the lack of refrigeration prevented significant use in this form. Pollock's rise to fame in world fisheries awaited its successful use in the production of fish paste or *surimi*—the basis for *kamaboko* (fish cake) production. The combination of a large resource, the adoption of modern refrigeration, and extensive marketing throughout Japan led not only to escalating sales of *kamaboko*, but stimulated the development of a wide variety of other *surimi*-based products. This, in turn, led to still further increases in pollock consumption.

There is a wide variety of *surimi*-base products and *kamaboko* specialties in Japan. Each company guards its unique product formulae, and each caters to certain market preferences.

Japanese *surimi* products are generally grouped as *kamaboko* and *chikuwa* categories, which include such items as fish ham, sausages, lunch meats, fish cakes, and artificial crab, scallops and shrimp. These products, which are a mixture of pollock *surimi* and starches, vegetable proteins, seasonings, etc., are comprised of 45 to 60 percent pollock. The number and variety of pollock products in Japan are detailed in statistical reports, and the size of the Japanese industry based on pollock is well documented.

Production of Japanese paste products exceeded 850,000 tons annually throughout the 1970's, then dropped to about 730,000 tons in 1981, probably as a result of reduced quantities of pollock available to the Japanese fleets in their traditional fishing areas, and a softening of Asian markets due to changing consumer preferences and the increasing cost of *surimi*.

In addition to *surimi*, several hundred million pounds

of pollock is sold each year in Japan through fresh fish markets, and small quantities are made into meal. Finally, there is the growing and valuable roe market. The Japanese consumed about 46,000 tons of pollock roe, worth over \$250 million in 1982, of which close to 46 percent was imported from the U.S.S.R., North Korea, South Korea and the U.S. The roe is prepared for the market in salted or "chili" form, the latter made with peppers. A breakdown of pollock roe production and origin of roe by nation for 1982 is given in Table 2.

The 1½- to 2-billion-pound Japanese market for pollock products staggers the imagination. Capturing just a small part of it would be lucrative.

A less known but even more important user of the world pollock resource is the Soviet Union. Roughly 2 million tons per year is channeled through Soviet ports, mainly Nakhodka, in the form of *spinka*, a headed and diagonally-cut gutted fish with fins removed, which is frozen into blocks and distributed throughout the U.S.S.R. The product is marketed as a thawed, headed and gutted fish. A rumor of product diversification similar to Japan has been reported but not yet verified.

Finally, the Koreans continue to use a significant quantity of pollock in dried form. South Korea reportedly produced over 10,000 tons of dried product annually during the late 1970's (equivalent round weight of about 60,000 tons). The North Koreans apparently dry an even higher percentage of their catch, perhaps using more than 200,000 tons for that purpose, with the remainder sold fresh. In addition to products earmarked for domestic markets in North and South Korea, the South Koreans also export 25,000 to 30,000 tons of frozen blocks annually to U.S. east coast "converters," who turn it into fish sticks and the like.

To date, small-scale marketing of pollock products by U.S. entrepreneurs has been confined to fillets and, more recently, test marketing of fish cakes and patties.

The latter operations, undertaken by Mermaid Fisheries Co., constitute a new thrust in U.S. marketing; however, acceptance of frozen fillets, artificial crab legs and fish cakes made of pollock by U.S. consumers is increasing. Pollock end products are shown in Figure 5. The continued dominance of Asia in the marketing of pollock is obvious, but change is also perceptible (Figure 6).

Value of Pollock

Calculating the value of pollock as a food is complicated by the diversity of products, by the added value accrued at each successive processing and marketing stage, and by the difficulty of equating monetary systems. We have, nevertheless, made a stab at estimating the value of pollock at the fisherman level, and the wholesale value of pollock consumed either as a form of fish or as a paste product. The total is estimated conservatively at \$3.2 billion annually, of which U.S. fishermen and processors receive only about \$50 million (Table 3).

Factors Influencing Development

Despite initial setbacks by U.S. processors and difficulty in finding a niche in the pollock market, enthusiasm about U.S. prospects for harvesting, processing and marketing large volumes of pollock is on the rise. Pollock boosters point to the encouraging results from small-scale sales in the U.S. of frozen fillets

caught by U.S. factory trawlers, to the test marketing of fish cakes and patties, to the good acceptance in West German markets of the pollock fillets produced by the *Friedrich Busse*, and to the possibility of creating markets for a variety of manufactured products in which pollock appears as the base protein.

Contributing to the enthusiasm is a growing recognition by processors that year-round bottomfish operations are crucial to the optimum utilization of plants and real estate holdings that are now used only for the highly seasonal salmon, herring, halibut, shrimp and crab fisheries. Bottomfish is also the only viable candidate for taking up some of the slack caused by the depressed status of practically all of Alaska's traditionally harvested species, except salmon. As shown in Figure 7, the industry is now heavily dependent on traditional species, with salmon and crab in 1981 having represented 90 percent of the ex-vessel value of all species caught off Alaska.

Winning the pollock game will, however, demand a more serious evaluation of the cards held by U.S. harvesters and processors. The industry must look realistically toward overcoming the economic problems that will hamper particular options, and gain the willingness and confidence to pay the price required to stay in the game. The creation of the Japanese pollock industry did not come without substantial investment in technology, market development and dedication to product quality. We can, of course, take advantage of the experience and

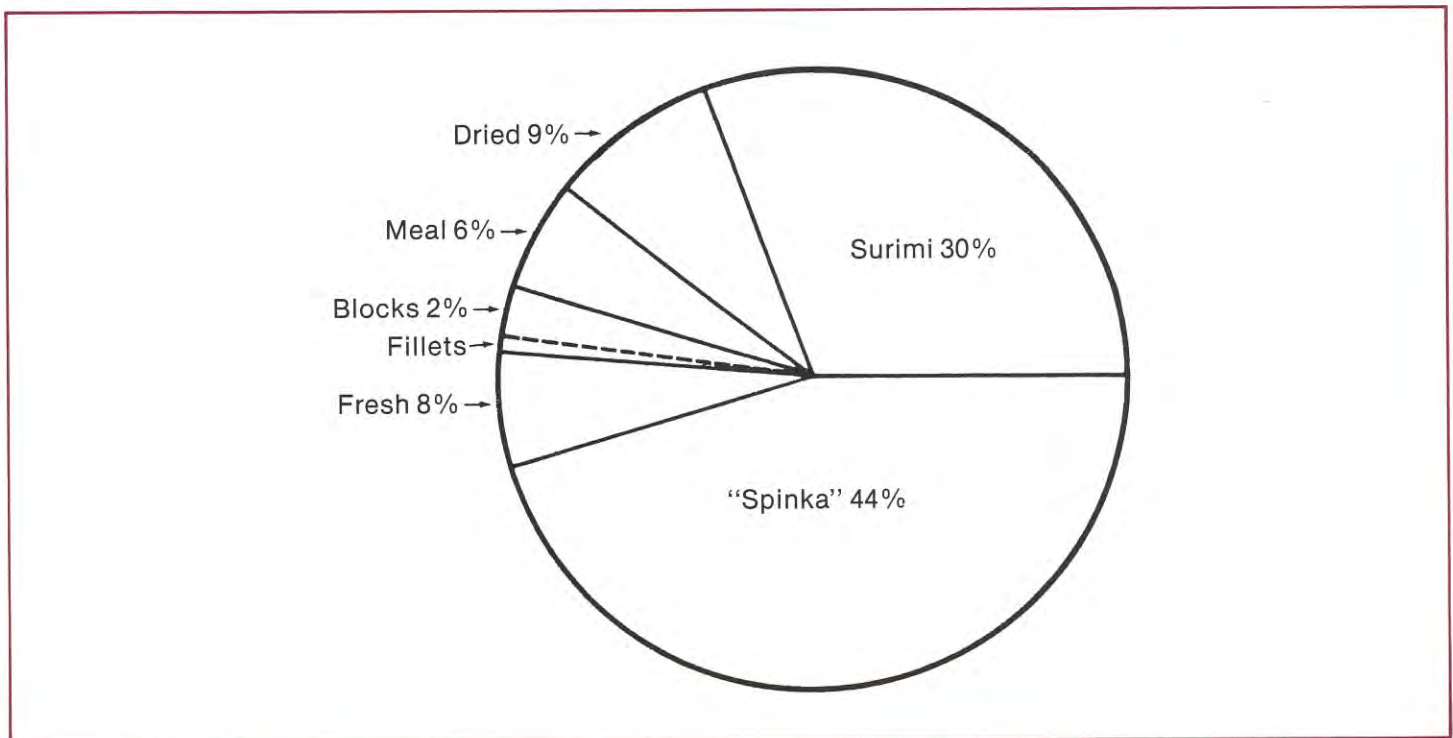


Figure 5. Estimated percentage of round weight of pollock catch used in various forms. (Based on projected catch of 4.5 million tons.)

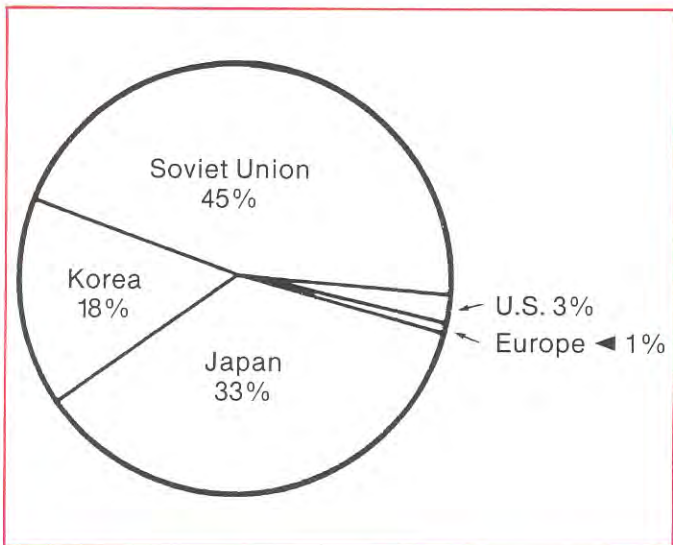


Figure 6. Estimated pollock product flow (percent of round weight) in 1982. Based on world catch of 4.5 million tons.

knowledge of our foreign competitors, but the cost of becoming successful competitors will involve significant risk.

We can minimize this risk by clearly understanding the factors likely to promote success or failure, and the advantages and disadvantages a U.S.-based industry will exhibit. First, what trump cards does the U.S. hold?

1. The large size of Alaska's pollock resource (over half of the sustainable yield of all the state's bottomfish) and its suitability for numerous applications in the market place constitute a raw material source upon which a significant industry can be built.

2. The resource appears to be reasonably stable and relatively easy to harvest, allowing vessels to sustain

high catch rates and maintain relatively low costs per unit of production.

3. A significant portion of the world Pacific pollock resource, perhaps as much as 40 percent, inhabits the waters adjacent to Alaska, within close proximity to U.S. ports.

4. Access to the resource in both the eastern and western Pacific is limited by extended jurisdiction. In the eastern Pacific U.S. fishermen and processors have preferential access. Continued foreign access is subject to the "Fish and Chips" policy that gives preference to domestic operators. Furthermore, development of a U.S. phaseout of foreign fishing is possible.

5. Consumer interest in fish as a nutritional food seems to be on the rise, and pollock ranks high as a source of nutritious protein.

6. Pollock has a large, established market in Asia and can be used as a quality fillet product in the U.S.

7. Japanese have built a huge industry in 20 years on high technology, something the U.S. is capable of replicating.

8. Japanese markets already exist, but the U.S. has the growth potential. Presumably, Americans know the U.S. consumer best.

9. Interest rates are down.

Probably the strongest card in this hand is the control over resource access. We should not indulge in self-delusion and assume that the rapid growth of joint ventures came about because of its attractive economics. Direct access to U.S. fish was obviously the trade off for the provision of markets for U.S. fishermen, and continues to be the strongest encouragement for foreign nations to participate with Americans in joint ventures.

This does not imply that joint ventures have not made money for all participants. There is increasing evidence that some joint venture operations are highly

Fisheries level		1,000,000,000
Consumed as pollock		
Roe	250,000,000	
Dried	65,000,000	
Blocks	40,000,000	
Spinka	1,100,000,000	
Fresh & other	300,000,000	
Subtotal		1,755,000,000
Consumed as Kamaboko or other prepared products		1,500,000,000
Total Pollock Products Value		3,255,000,000

¹Value are drawn from numerous data and should be considered to be approximations.

Table 3. Estimated world value (in U.S. dollars) of pollock products!

favorable to the foreign partners (e.g., the Shelikof Strait pollock fishery).

Regardless, in most instances the factor that has brought the parties together has been U.S. control over access to the pollock resource. This may also be the card that brings U.S. processors into the game. Although access is significant, the low cost of sustained harvesting and the fact that Pacific pollock is a high quality white fish should not be discounted.

Second, what disadvantages are likely to impede U.S. progress?

1. Present markets in Japan, the U.S.S.R. and North and South Korea are protected by quotas, duties, and other trade barriers.

2. There is a lack of consumer familiarity in the U.S.
 3. The high cost of fillet production, including parasite removal, in the U.S.

4. The foreign fleets now exploiting pollock were capitalized during the 1970's. Present replacement costs would be significantly higher.

5. The competition represented by lower-cost, imported white fish products that will hamper U.S. efforts in domestic and export markets.

The short term U.S. game plan is likely to include continued expansion of over-the-side joint ventures. In particular, attempts to extend the winter roe-surimi operations are likely. The apparently successful winter operations in Shelikof Strait, and the improved

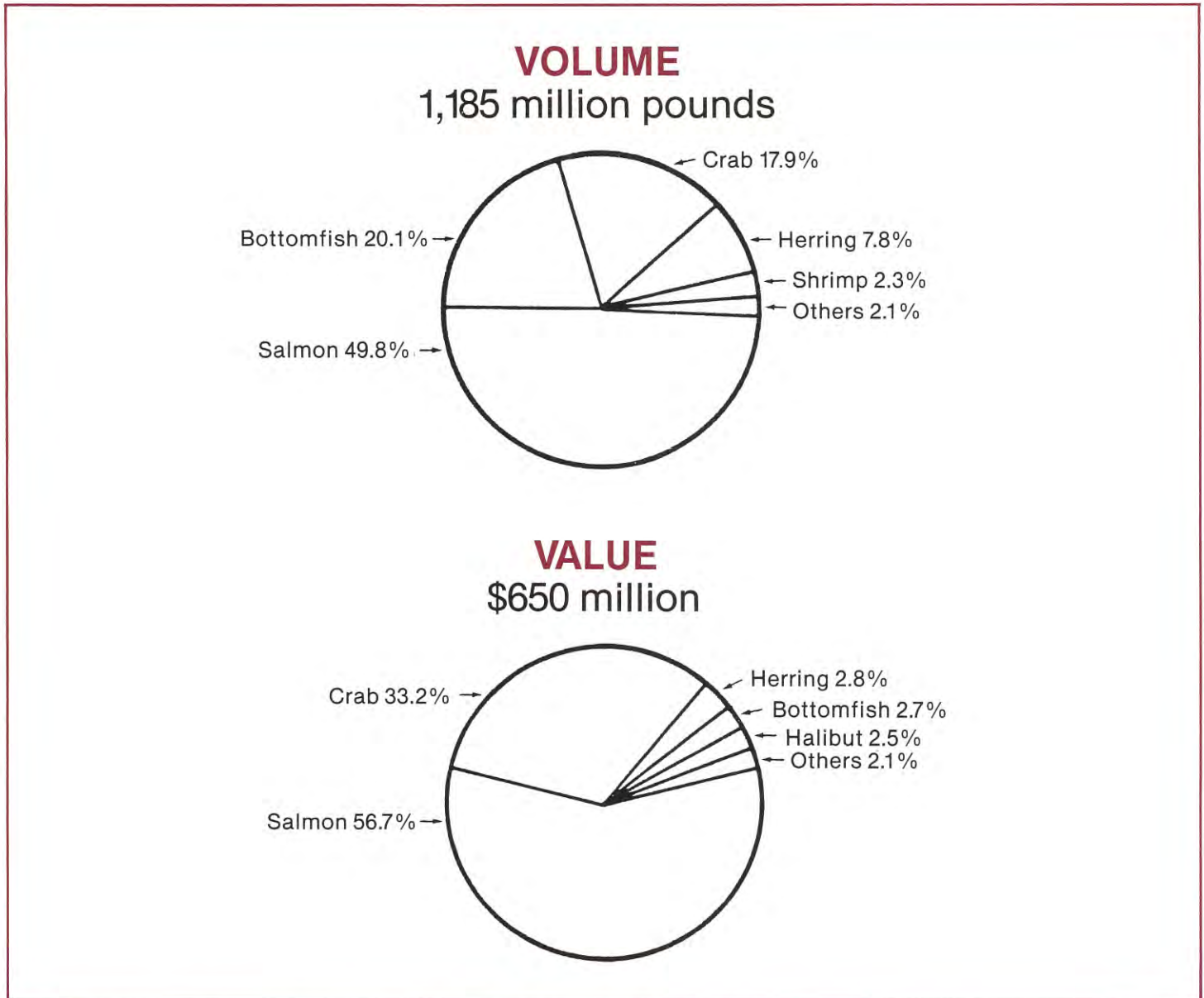


Figure 7. Volume and value to fishermen of 1981 Alaska catches, including joint venture catches of bottomfish by Americans delivered to foreign processing ships.

Japanese yen/dollar ratio, may lead to attempts to develop similar fisheries elsewhere in Alaska. An announcement by Kibun, the largest producer of *kamaboko* products in Japan, that it is planning to open a \$7 million plant in Redmond, Washington, came as a surprise to the pollock skeptics. They should have guessed that the successful introduction of artificial crab legs (*kanebo*) would lead to product manufacture in the U.S.

Alaska seafood processors have recently mounted a political push for a phase-out of foreign fishing within five years, and Republican Senator Ted Stevens of Alaska has introduced legislation that would accomplish this purpose. Whether such legislation is enacted or not, the message is clear. Processors are seeking a greater role in the bottomfish game. A phase-out in any form would potentially help U.S. processors by opening up Japanese markets, or restricting U.S. pollock supplies to foreign processors who export such products back to the U.S.

But the real benefit of phase-out would only come if U.S. processors are able to supply their markets with competitively priced quality products. This may be easier to accomplish with *surimi* in Japan than in the U.S. fillet or block markets. Local converters may move to offset losses of pollock imports from South Korea with Canadian, European or South American white fish.

Japan, on the other hand, may have few alternatives for obtaining pollock for its *surimi* production other than the Soviets and North Koreans. Whether these resources are available at prices which would allow production of *surimi* at current costs is questionable.

It may well be that the next major step in the expansion of the U.S. pollock processing sector will involve a joint venture with Japanese partners, and entrance into the *surimi* market. The eventual strategy of the U.S., however, should be to develop and supply pollock markets within the U.S. This will probably require developing and marketing a variety of minced fish and *surimi*-like products specifically tailored for the taste and texture preferences of U.S. consumers. A breakthrough in suitable products, combined with an expanded market for quality fillets, may offer the foothold needed by the full U.S. fishing industry. The importation and sale of over 6,500 tons of artificial crab legs in the U.S. market in 1982 strongly suggests that pollock products can be developed with texture, taste and appearance attractive to the U.S. consumer.

The chips will be expensive, but the cost of entering the game will be to "ante up" and draw the needed cards. Alaska Fisheries Development Foundation will join the game this year with a major program designed to demonstrate the U.S. ability to displace foreign harvesting and boost the beginning of a sturdy U.S. pollock industry.

The AFDF program will help, but the future role of the U.S. in the pollock game will depend on the investment and commitment of both harvesters and

processors. There are obviously a number of alternatives in approaching our future.

A viable U.S. industry could be built on the creation of new products such as fish patties and sausages, on frozen fillet production for domestic consumption, or on entry into extant foreign markets. There will be risks along each avenue, and U.S. participants will have to use every advantage at their disposal, such as priority access to resources, the elimination of current Japanese quotas and tariffs, and ensuring that new markets developed in the U.S. are not subject to an influx of competition from imports of pollock from Asia or other countries.

factors influencing development

Almost eight years have slipped away since the passage of the Magnuson Fishery Conservation and Management Act (MCFMA) in 1976. This unilateral move by the U.S. in extending its fishery zone from 12 to 200 miles was hailed by almost all sectors of the Pacific Northwest fishing industry as a major step toward ensuring rational use of the country's marine resources. Equally important, it was perceived as a way to create an environment in which the domestic fishing industry could fully explore and develop the extensive resource potential that existed on the continental shelf and slope areas adjacent to the U.S.

As noted in the AFDF 1981 publication, "Fisheries of Alaska," in the view of many, "development has sputtered, been sporadic in character and has not occurred along the lines nor at the rate many had hoped." This can hardly be said for 1982, which was truly a year of significant change.

A major beginning occurred in shoreside processing of cod, while at sea, the number of factory trawlers increased to four. It was, in addition, a banner year for joint ventures which almost doubled 1981 production. Growth of the export market for fresh and frozen salmon continued. Expectations are for continued growth of joint ventures and expanding factory trawler operations in 1983.

In examining factors influencing development in 1981, four key elements were identified as dominating future growth patterns: 1) high interest rates, 2) high fuel costs, 3) high construction and repair costs, and 4) foreign competition.

In the span of 12 months, interest rates have dropped dramatically, declining from about 17 percent to a current level of 10.5. Fuel costs have also stabilized, but remain high. A significant decrease in vessel construction costs has also occurred. Bids on comparably sized factory trawlers suggest current vessel costs may be down as much as 20 percent from those quoted only six to 12 months ago. Thus, the general economic situation has improved in terms of processor loan costs, the cost of vessel construction and stabilized fuel prices.

Resource Dynamics

Over the next several years, these economic factors will continue to strongly influence development patterns. However, equal or greater importance must be given to potential changes in abundance of the resources to be harvested. Historically, the Alaska fishing industry has been confronted with the cyclical ups and downs of major salmon runs. Although a great deal is said regarding development of a stable salmon industry, good management is likely to do little more than dampen nature's propensity to produce major

perturbations in the size of Alaska's salmon resources.

The consequences of changing resource abundance became clear in 1982 when both king crab and shrimp stocks continued their downward spiral. Reverberations resulting from loss of resources have rocked the entire Alaska fishing scene. Events are likely to become even more dramatic in the next several years when both king and Tanner crab are expected to bottom out, and shrimp catches may remain low.

Sharply declining stocks of crab and shrimp have forced major sectors of the industry to either retrench or consider alternative resources. Crab and shrimp vessel operators have attempted to offset income losses in these areas by moving into bottomfish joint ventures or salt cod production. This pattern is likely to continue over the next several years.

There are other resource changes that are also likely to impact Alaska fishery development. A large question looms regarding the future of Pacific cod, which may have crested the resource peak and could begin to decline in abundance as early as next year. Even in a steady-state situation, the increased competition for the available resource would likely drive down catch rates. If stock sizes do decline and additional vessels enter the fishery, maintaining high catch rates will become more difficult.

Declining stock size does not, however, necessarily mean the U.S. cod fishery is in trouble. Lower stock abundance may well be offset by improved fishing tactics resulting from experience gained over the past two years and by phasing out foreign target fisheries for cod to reduce competition.

The abundance of cod throughout the North Atlantic will also be a factor in determining the Alaska cod industry's cash balance at the end of the 1983 season. The resource factors, however, suggest that U.S. fishermen will have to become increasingly productive over the next few years to stay in the black.

Resource trends in salmon will also impact development patterns. Although run sizes are expected to decline somewhat from the level of recent years, the market may not respond positively by raising prices. Holdovers of 1982 production, combined with the increasing availability of Norwegian cultured Atlantic salmon and trout, may soften the 1983 price structure. It should also be noted that the Japanese are continuing to increase hatchery releases of chum and pink salmon in northern Honshu and Hokkaido. Smolt releases are as much as 70 percent greater than those that produced recent large catches in northern Japan. U.S. processors may be faced with the need to explore new marketing options if they are to achieve or maintain profit margins and hold up ex-vessel prices.

The Testing Ground

A significant factor governing fishery development will be the success or failure of new ventures. The pioneers of any new development create the testing ground which establishes a base of knowledge that allows others to avoid pitfalls and take advantage of breakthroughs. The Alaska fishing industry has experienced an abundance of both failures and successes in recent years.

The sidelines are currently crowded with interested spectators or potential players watching the results of factory trawler efforts such as those of the *Arctic Trawler* and *Golden Alaska*. By the time this report goes to press, the *Northern Glacier*, the Alaskan industry's third major factory trawler, will have been launched in preparation for a late fall commencement of cod operations. The 201-foot vessel is the first U.S. factory trawler built specifically to engage in at-sea catching and fillet processing of cod for U.S. markets. The combined factory trawler fleet, which will include three vessels over 200 feet and several over 150 feet, will form an important experience-base for investors whose success or failure may sharply influence future development patterns.

The effort by Trident Seafoods to get the Alaska shoreside groundfish industry underway can serve as a valuable experience for investors. The growing sales of pollock fillets and fish cakes provide another testing ground. At-sea and shoreside processing represent distinctly different approaches to entering the groundfish fishery, each with its advantages and disadvantages. In following the performance of these ventures, it will be more important to identify *why* an effort succeeds or fails than *if* it succeeds or fails.

The Political Process

The continued evolution of national policy concerning the FCZ, such as national support for the fishing industry and administrative commitments to achieving the industry development envisioned in the MFCMA, will play a major role both in the character and rate of growth of Alaskan fisheries. The large increases in joint venture production over the past several years have had their roots in government and industry pressure to more effectively use the "Fish and Chips" amendment to the MFCMA.

Recent efforts on the part of the Pacific Seafood Processors Association (PSPA) and National Fishery Institute (NFI) to promote a phase-out of all foreign fishing represent a new thrust on the part of the processing sector of the fishing industry. It may run counter to the interests of joint venture enthusiasts, but even participating fishermen share the attitude that some strategy should be found to enhance the prospect of greater processor participation in the growing groundfish industry.

The progress made by harvesters in joint ventures might be duplicated by U.S. processors if a phase-out strategy acceptable to both groups can be formulated. In conjunction with national policy developments, fishery legislation could also assist development strategy. Of particular interest is the outcome of legislation designed to 1) allow greater use of foreign workers on at-sea processors, 2) attempt to circumvent regulations preventing use of foreign hulls and 3) develop a quasi-governmental "fishery development corporation."

In considering factors influencing development, it is important to note that successful development will be contingent on myriad interactive issues. Local resource changes must be considered in light of national and international resource marketing policies, fluctuating interest rates, foreign exchange, etc. U.S. policy must be gauged against policies set abroad, such as subsidies, trade restrictions, etc.

Ultimately, industry success will be the fruit of a clearly defined strategy for overcoming major difficulties and risks. There is no ready formula for success, but major beginnings occurred in 1982 in arenas that may represent the future of the Alaska fishing industry, and progress should accelerate in 1983.

notes
